

# Economic Principles

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Draft Version

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# How the Economic Machine Works

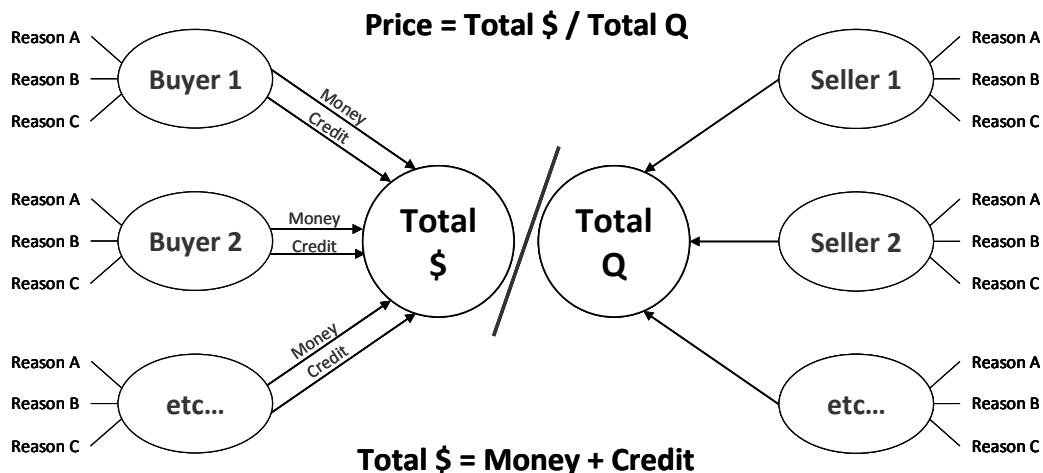
The economy is like a machine. At the most fundamental level it is a relatively simple machine. But many people don't understand it - or they don't agree on how it works - and this has led to a lot of needless economic suffering. I feel a deep sense of responsibility to share my simple but practical economic template, and wrote this piece to describe how I believe it works. My description of how the economy works is different from most economists'. It has worked better, allowing me to anticipate the great deleveragings and market changes that most others overlooked. I believe that is because it is more practical. Since I certainly do not want you to blindly believe in my description of how the economic machine works, I have laid it out clearly so that you can assess the value of it yourself. So, let's begin.

## How the Economic Machine Works: "A Transactions-Based Approach"

An economy is simply the sum of the transactions that make it up. A transaction is a simple thing. Because there are a lot of them, the economy looks more complex than it really is. If instead of looking at it from the top down, we look at it from the transaction up, it is much easier to understand.

A transaction consists of the buyer giving money (or credit) to a seller and the seller giving a good, a service or a financial asset to the buyer in exchange. A market consists of all the buyers and sellers making exchanges for the same things - e.g., the wheat market consists of different people making different transactions for different reasons over time. An economy consists of all of the transactions in all of its markets. So, while seemingly complex, an economy is really just a zillion simple things working together, which makes it look more complex than it really is.

For any market, or for any economy, if you know the total amount of money (or credit) spent and the total quantity sold, you know everything you need to know to understand it. For example, since the price of any good, service or financial asset equals the total amount spent by buyers (total \$) divided by the total quantity sold by sellers (total Q), in order to understand or forecast the price of anything you just need to forecast total \$ and total Q. While in any market there are lots of buyers and sellers, and these buyers and sellers have different motivations, the motivations of the most important buyers are usually pretty understandable and adding them up to understand the economy isn't all that tough if one builds from the transactions up. What I am saying is conveyed in the simple diagram below. This perspective of supply and demand is different from the traditional perspective in which both supply and demand are measured in quantity and the price relationship between them is described in terms of elasticity. This difference has important implications for understanding markets.



The only other important thing to know about this part of the Template is that spending (\$) can come in either of two forms – money and credit. For example, when you go to a store to buy something you can pay with either a credit card or cash. If you pay with a credit card you have created credit, which is a promise to deliver money at a later date,<sup>1</sup> whereas, if you pay with money, you have no such liability.

In brief, there are different types of markets, different types of buyers and sellers and different ways of paying that make up the economy. For simplicity, I will put them in groups and summarize how the machine works. Most basically:

- All changes in economic activity and all changes in financial markets' prices are due to changes in the amounts of 1) money or 2) credit that are spent on them (total \$), and the amounts of these items sold (total Q). Changes in the amount of buying (total \$) typically have a much bigger impact on changes in economic activity and prices than do changes in the total amount of selling (total Q). That is because there is nothing that's easier to change than the supply of money and credit (total \$).
- For simplicity, let's cluster the buyers in a few big categories. Buying can come from either 1) the private sector or 2) the government sector. The private sector consists of "households" and businesses that can be either domestic or foreign. The government sector most importantly consists of a) the Federal Government,<sup>2</sup> which spends its money on goods and services and b) the central bank, which is the only entity that can create money and, by and large, mostly spends its money on financial assets.

Because money and credit, and through them demand, are easier to create (or stop creating) than the production of goods and services and investment assets, we have economic and price cycles.

Seeing the economy and the markets through this "transactions-based" perspective rather than seeing it through the traditional economic perspective has made all the difference in the world to my understanding of what is going on and what is likely to happen. It lets me see what is actually happening and why it's happening in much more granular ways than the traditional way of looking at things. I will give you a few examples:

1. The traditional way of looking at the relationship between supply, demand and price measures both supply and demand via the same quantity number (i.e., at any point the demand is equal to the supply which is the amount of quantity exchanged) and the price is described as changing via what is called velocity. There is no attention paid to the total amount of spending that occurred, who spent it, and why they spent it. Yet, in any time and across all time frames, the relationship between the change in the quantities exchanged and the change in the price will change based on these factors that are being ignored. Throwing all buyers into one group (rather distinguishing between them and understanding their motivations) and measuring their demand in terms of quantity bought (rather than in the amount spent) and ignoring whether the spending was paid for via money or credit, creates a theoretical and imprecise picture of the markets and the economy.
2. Most of what economists call the velocity of money is not the velocity of money at all – it is credit creation. Velocity is a misleading term created to explain how the amount of spending in a year (GDP) could be paid for by a smaller amount of money. To explain this relationship, people divided the amount of GDP by the amount of money to convey the picture that money is going around at a speed of so many times per year, which is the called the velocity. The economy doesn't work that way. Instead, much of spending comes from credit creation, and credit creation doesn't need money to go around in order to occur. Understanding this has big implications for understanding how the economy and markets will work. For example, whereas one who has the traditional perspective might think that a large increase in the amount of money will be inflationary, one using a transactions based approach will understand that it

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<sup>1</sup> Credit can be created on the spot between consenting parties. The idea of money going around via "velocity" and adding up to nominal GDP is a misleading description of what happens.

<sup>2</sup> State and local governments are of course still significant.

is the amount of spending that changes prices, so that if the increase in the amount of money is offsetting a decrease in the amount of credit, it won't make a difference; in fact, if the amount of credit is contracting and the amount of money is not increased, the amount of spending will decline and prices will fall.

This different way of looking at the economy and markets has allowed us to understand and anticipate economic booms and busts that others using more traditional approaches have missed.

## How the Market-Based System Works

As mentioned, the previously outlined economic players buy and sell both 1) goods and services and 2) financial assets, and they can pay for them with either 1) money or 2) credit. In a market-based system, this exchange takes place through free choice – i.e., there are “free markets” in which buyers and sellers of goods, services and financial assets make their transactions in pursuit of their own interests. The production and purchases of financial assets (i.e., lending and investing) is called “capital formation”. It occurs because both the buyer and seller of these financial assets believe that the transaction is good for them. Those with money and credit provide it to recipients in exchange for the recipients’ “promises” to pay them more. So, for this process to work well, there must be large numbers of capable providers of capital (i.e., investors/lenders) who choose to give money and credit to large numbers of capable recipients of capital (borrowers and sellers of equity) in exchange for the recipients’ believable claims that they will return amounts of money and credit that are worth more than they were given. While the amount of money in existence is controlled by central banks, the amount of credit in existence can be created out of thin air – i.e., any two willing parties can agree to do a transaction on credit – though this is influenced by central bank policies. In bubbles more credit is created than can be later paid back, which creates busts.

When capital contractions occur, economic contractions also occur, i.e., there is not enough money and/or credit spent on goods, services and financial assets. These contractions typically occur for two reasons, which are most commonly known as recessions (which are contractions within a short-term debt cycle) and depressions (which are contractions within deleveragings). Recessions are typically well understood because they happen often and most of us have experienced them, whereas depressions and deleveragings are typically poorly understood because they happen infrequently and are not widely experienced.

A short-term debt cycle, (which is commonly called the business cycle), arises from a) the rate of growth in spending (i.e., total \$ funded by the rates of growth in money and credit) being faster than the rate of growth in the capacity to produce (i.e., total Q) leading to price (P) increases until b) the rate of growth in spending is curtailed by tight money and credit, at which time a recession occurs. In other words, a recession is an economic contraction that is due to a contraction in private sector debt growth arising from tight central bank policy (usually to fight inflation), which ends when the central bank eases. Recessions end when central banks lower interest rates to stimulate demand for goods and services and the credit growth that finances these purchases, because lower interest rates 1) reduce debt service costs; 2) lower monthly payments (de-facto, the costs) of items bought on credit, which stimulates the demand for them; and 3) raise the prices of income-producing assets like stocks, bonds and real estate through the present value effect of discounting their expected cash flows at the lower interest rates, producing a “wealth effect” on spending.

In contrast:

A long-term debt cycle, arises from debts rising faster than both incomes and money until this can't continue because debt service costs become excessive, typically because interest rates can't be reduced any more. A deleveraging is the process of reducing debt burdens (i.e., debt and debt service relative to incomes). Deleveragings typically end via a mix of 1) debt reduction,<sup>3</sup> 2) austerity, 3) redistributions of wealth, and 4) debt

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<sup>3</sup> Debt reductions take the form of some mix of debt write-downs (so the amount of debt to be repaid is reduced), the timing of debt payments being extended and interest rates being reduced.

monetization. A depression is the economic contraction phase of a deleveraging. It occurs because the contraction in private sector debt cannot be rectified by the central bank lowering the cost of money. In depressions, a) a large number of debtors have obligations to deliver more money than they have to meet their obligations, and b) monetary policy is ineffective in reducing debt service costs and stimulating credit growth.

Typically, monetary policy is ineffective in stimulating credit growth either because interest rates can't be lowered (because interest rates are near 0%) to the point of favorably influencing the economics of spending and capital formation (this produces deflationary deleveragings), or because money growth goes into the purchase of inflation-hedge assets rather than into credit growth, which produces inflationary deleveragings. Depressions are typically ended by central banks printing money to monetize debt in amounts that offset the deflationary depression effects of debt reductions and austerity.

To be clear, while depressions are the contraction phase of a deleveraging, deleveragings (e.g., reducing debt burdens) can occur without depressions if they are well managed. (See "An In-Depth Look at Deleveragings.")

Differences in how governments behave in recessions and deleveragings are good clues that signal which one is happening. For example, in deleveragings, central banks typically "print" money that they use to buy large quantities of financial assets in order to compensate for the decline in private sector credit, while these actions are unheard of in recessions.<sup>4</sup> Also, in deleveragings, central governments typically spend much, much more to make up for the fall in private sector spending.

But let's not get ahead of ourselves. Since these two types of contractions are just parts of two different types of cycles that are explained more completely in this Template, let's look at the Template.

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<sup>4</sup> These show up in changes on their balance sheets that don't occur in recessions.

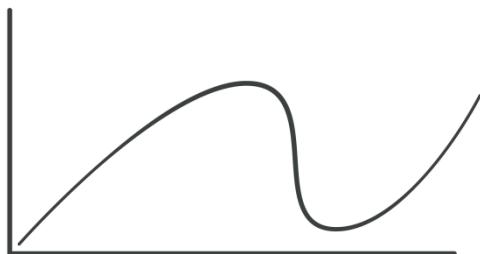
## The Template: The Three Big Forces

I believe that three main forces drive most economic activity: 1) trend line productivity growth, 2) the long-term debt cycle and 3) the short-term debt cycle. Figuratively speaking, they look as shown below:

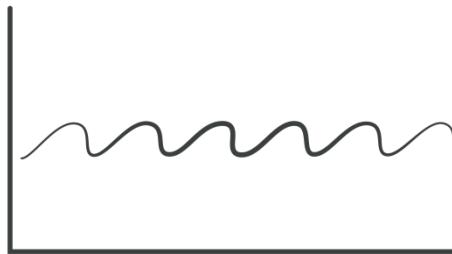
1.



2.



3.



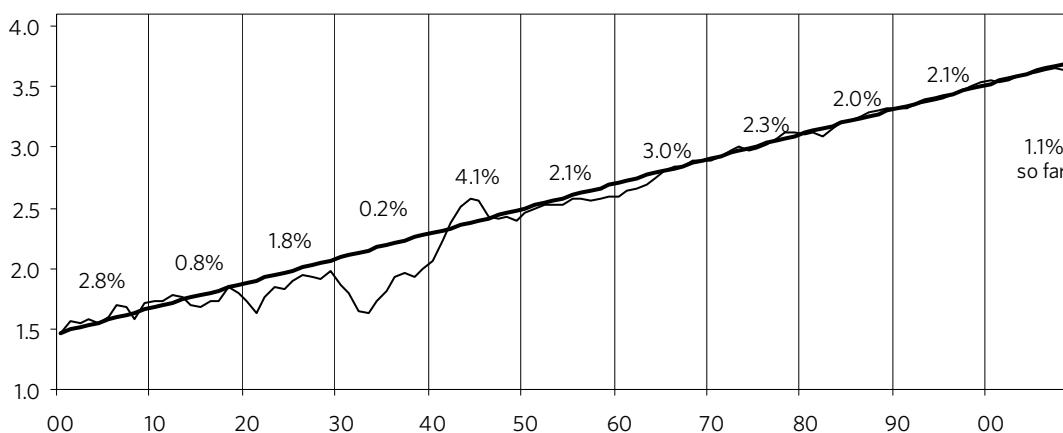
What follows is an explanation of all three of these forces and how, by overlaying the archetypical short-term debt cycle on top of the archetypical long-term debt cycle and overlaying them both on top of the productivity trend line, one can derive a good template for tracking most economic/market movements. While these three forces apply to all countries' economies, in this study we will look at the U.S. economy over the last 100 years or so as an example to convey the Template. This Template will tell you just about everything I have to say in a nutshell. If you are interested to explore these concepts in more depth you can go into the next two chapters of this book.

## 1) Productivity Growth

As shown below in chart 1, real per capita GDP has increased at an average rate of a shade less than 2% over the last 100 years and didn't vary a lot from that. This is because, over time, knowledge increases, which in turn raises productivity and living standards. As shown in this chart, over the very long run, there is relatively little variation from the trend line. Even the Great Depression in the 1930s looks rather small. As a result, we can be relatively confident that, with time, the economy will get back on track. However, up close, these variations from trend can be enormous. For example, typically in depressions the peak-to-trough declines in real economic activity are around 20%, the destruction of financial wealth is typically more than 50% and equity prices typically decline by around 80%. The losses in financial wealth for those who have it at the beginning of depressions are typically greater than these numbers suggest because there is also a tremendous shifting of who has wealth.

**Chart 1**

**Real GDP Per Capita (2008 Dollars, ln)**



Sources: Global Financial Data & BW Estimates

Swings around this trend are not primarily due to expansions and contractions in knowledge. For example, the Great Depression didn't occur because people forgot how to efficiently produce, and it wasn't set off by war or drought. All the elements that make the economy buzz were there, yet it stagnated. So why didn't the idle factories simply hire the unemployed to utilize the abundant resources in order to produce prosperity? These cycles are not due to events beyond our control, e.g., natural disasters. They are due to human nature and the way the credit system works.

Most importantly, major swings around the trend are due to expansions and contractions in credit - i.e., credit cycles, most importantly 1) a long-term (typically 50 to 75 years) debt cycle and 2) a shorter-term (typically 5 to 8 years) debt cycle (i.e., the "business/market cycle"). Productivity is examined in greater depth in chapter III, "Productivity and Structural Reform: Why Countries Succeed & Fail, and What Should Be Done So Failing Countries Succeed."

## The Two Debt Cycles

I find that whenever I start talking about cycles, particularly the long-term variety, I raise eyebrows and elicit reactions similar to those I'd expect if I were talking about astrology. For this reason, before I begin explaining these two debt cycles I'd like to say a few things about cycles in general.

A cycle is nothing more than a logical sequence of events leading to a repetitious pattern. In a market-based economy, cycles of expansions in credit and contractions in credit drive economic cycles and they occur for perfectly logical reasons. Each sequence is not pre-destined to repeat in exactly the same way nor to take exactly the same amount of time, though the patterns are similar, for logical reasons. For example, if you understand the game of Monopoly®, you can pretty well understand credit and economic cycles. Early in the game of Monopoly®, people have a lot of cash and few hotels, and it pays to convert cash into hotels. Those who have more hotels make more money. Seeing this, people tend to convert as much cash as possible into property in order to profit from making other players give them cash. So as the game progresses, more hotels are acquired, which creates more need for cash (to pay the bills of landing on someone else's property with lots of hotels on it) at the same time as many folks have run down their cash to buy hotels. When they are caught needing cash, they are forced to sell their hotels at discounted prices. So early in the game, "property is king" and later in the game, "cash is king." Those who are best at playing the game understand how to hold the right mix of property and cash, as this right mix changes.

Now, let's imagine how this Monopoly® game would work if we changed the role of the bank so that it could make loans and take deposits. Players would then be able to borrow money to buy hotels and, rather than holding their cash idly, they would deposit it at the bank to earn interest, which would provide the bank with more money to lend. Let's also imagine that players in this game could buy and sell properties from each other giving each other credit (i.e., promises to give money and at a later date). If Monopoly® were played this way, it would provide an almost perfect model for the way our economy operates. There would be more spending on hotels (that would be financed with promises to deliver money at a later date). The amount owed would quickly grow to multiples of the amount of money in existence, hotel prices would be higher, and the cash shortage for the debtors who hold hotels would become greater down the road. So, the cycles would become more pronounced.

The bank and those who saved by depositing their money in it would also get into trouble when the inability to come up with needed cash caused withdrawals from the bank at the same time as debtors couldn't come up with cash to pay the bank. Basically, economic and credit cycles work this way.

We are now going to look at how credit cycles – both long-term debt cycles and short-term debt cycles – drive economic cycles. But first we need to understand some basics of how money and credit work in a market-based system.

### Money and Credit in a Market-Based System

Prosperity exists when the economy is operating at a high level of capacity: in other words, when demand is pressing up against a pre-existing level of capacity. At such times, business profits are good and unemployment is low. The longer these conditions persist, the more capacity will be increased, typically financed by credit growth. Declining demand creates a condition of low capacity utilization; as a result, business profits are bad and unemployment is high. The longer these conditions exist, the more cost-cutting (i.e., restructuring) will occur, typically including debt and equity write-downs. Therefore, prosperity equals high demand, and in our credit-based economy, strong demand equals strong real credit growth; conversely, deleveraging equals low demand, and hence lower and falling real credit growth. Contrary to now-popular thinking, recessions and depressions do not develop because of productivity (i.e., inabilities to produce efficiently); they develop from declines in demand, typically due to a fall-off in credit creation.

Since changes in demand precede changes in capacity in determining the direction of the economy, one would think that prosperity would be easy to achieve simply through pursuing policies that would steadily increase demand. When the economy is plagued by low capacity utilization, depressed business profitability and high unemployment, why doesn't the government simply give it a good shot of whatever it takes to stimulate demand in order to produce a far more pleasant environment of high capacity utilization, fat profits and low unemployment? The answer has to do with what that shot consists of.

## Money

Money is what you settle your payments with. Some people mistakenly believe that money is whatever will buy you goods and services, whether that's dollar bills or simply a promise to pay (e.g., whether it's a credit card or an account at the local grocery). When a department store gives you merchandise in return for your signature on a credit card form, is that signature money? No, because you did not settle the transaction. Rather, you promised to pay money. So you created credit, which is a promise to pay money.

The Federal Reserve has chosen to define "money" in terms of aggregates (i.e., currency plus various forms of credit - M1, M2, etc.), but this is misleading. Virtually all of what they call money is credit (i.e., promises to deliver money) rather than money itself. The total amount of debt in the U.S. is about \$50 trillion and the total amount of money (i.e., currency and reserves) in existence is about \$3 trillion. So, if we were to use these numbers as a guide, the amount of promises to deliver money (i.e., debt) is roughly 15 times the amount of money there is to deliver.<sup>5</sup> The main point is that most people buy things with credit and don't pay much attention to what they are promising to deliver and where they are going to get it from, so there is much less money than obligations to deliver it.

## Credit

As mentioned, credit is the promise to deliver money, and credit spends just like money. While credit and money spend just as easily, when you pay with money the transaction is settled; but if you pay with credit, the payment has yet to be made.

There are two ways demand can increase: with credit or without it. Of course, it's far easier to stimulate demand with credit than without it. For example, in an economy in which there is no credit, if I want to buy a good or service I would have to exchange it for a comparably valued good or service of my own. Therefore, the only way I can increase what I own and the economy as a whole can grow is through increased production. As a result, in an economy without credit, the growth in demand is constrained by the growth in production. This tends to reduce the occurrence of boom-bust cycles, but it also reduces both the efficiency that leads to high prosperity and severe deleveraging, i.e., it tends to produce lower swings around the productivity growth trend line of about 2%.

By contrast, in an economy in which credit is readily available, I can acquire goods and services without giving up any of my own. A bank will lend the money on my pledge to repay, secured by my existing assets and future earnings. For these reasons credit and spending can grow faster than money and income. Since that sounds counterintuitive, let me give an example of how that can work.

If I ask you to paint my office with an agreement that I will give you the money in a few months, your painting my office will add to your income (because you were paid with credit), so it will add to GDP, and it will add to your net worth (because my promise to pay is considered as much of an asset as the cash that I still owe you). Our transaction will also add an asset (i.e., the capital improvement in my office) and a liability (the debt I still owe you) to my balance sheet. Now let's say that buoyed by this increased amount of business that I gave you and your improved financial condition that you want to expand. So you go to your banker who sees your increased income and net worth, so he is delighted to lend you some "money" (increasing his sales and his balance sheet)

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<sup>5</sup> As a substantial amount of dollar-denominated debt exists outside the U.S., the total amount of claims on dollars is greater than this characterization indicates, so it is provided solely for illustrative purposes.

that you decide to buy a financial asset with (let's say stocks) until you want to spend it. As you can see, debt, spending and investment would have increased relative to money and income.

This process can be, and generally is, self-reinforcing because rising spending generates rising incomes and rising net worths, which raise borrowers' capacity to borrow, which allows more buying and spending, etc. Typically, monetary expansions are used to support credit expansions because more money in the system makes it easier for debtors to pay off their loans (with money of less value), and it makes the assets I acquired worth more because there is more money around to bid them. As a result, monetary expansions improve credit ratings and increase collateral values, making it that much easier to borrow and buy more.

In such an economy, demand is constrained only by the willingness of creditors and debtors to extend and receive credit. When credit is easy and cheap, borrowing and spending will occur; and when it is scarce and expensive, borrowing and spending will be less. In the short-term debt cycle, the central bank will control the supply of money and influence the amount of credit that the private sector creates by influencing the cost of credit (i.e., interest rates). Changes in private sector credit drive the cycle. Over the long term, typically decades, debt burdens rise. This obviously cannot continue forever. When it can't continue a deleveraging occurs.

As previously mentioned, the most fundamental requirement for private sector credit creation to occur in a market-based system is that both borrowers and lenders believe that the deal is good for them. Since one man's debts are another man's assets, lenders have to believe that they will get paid back an amount of money that is greater than inflation (i.e., more than they could get by storing their wealth in inflation-hedge assets), net of taxes. And, because debtors have to pledge their assets (i.e., equity) as collateral in order to motivate the lenders, they have to be at least as confident in their ability to pay their debts as they value the assets (i.e., equity) that they pledged as collateral.

Also, an important consideration of investors is liquidity – i.e., the ability to sell their investments for money and use that money to buy goods and services. For example, if I own a \$100,000 Treasury bond, I probably presume that I'll be able to exchange it for \$100,000 in cash and in turn exchange the cash for \$100,000 worth of goods and services. However, since the ratio of financial assets to money is so high, obviously if a large number of people tried to convert their financial assets into money and buy goods and services at the same time, the central bank would have to either produce a lot more money (risking a monetary inflation) and/or allow a lot of defaults (causing a deflationary deleveraging).

## Monetary Systems

One of the greatest powers governments have is the creation of money and credit, which they exert by determining their countries' monetary systems and by controlling the levers that increase and decrease the supply of money and credit. The monetary systems chosen have varied over time and between countries. In the old days there was barter, i.e., the exchange of items of equal intrinsic value. That was the basis of money. When you paid with gold coins, the exchange was for items of equal intrinsic value. Then credit developed – i.e., promises to deliver "money" of intrinsic value. Then there were promises to deliver money that didn't have intrinsic value.

Those who lend expect that they will get back an amount of money that can be converted into goods or services of a somewhat greater purchasing power than the money they originally lent – i.e., they use credit to exchange goods and services today for comparably valuable goods and services in the future. Since credit began, creditors essentially asked those who controlled the monetary systems: "How do we know you won't just print a lot of money that won't buy me much when I go to exchange it for goods and services in the future?" At different times, this question was answered differently.

Basically, there are two types of monetary systems: 1) commodity-based systems – those systems consisting of some commodity (usually gold), currency (which can be converted into the commodity at a fixed price) and credit (a claim on the currency); and 2) fiat systems – those systems consisting of just currency and credit. In the

first system, it's more difficult to create credit expansions. That is because the public will offset the government's attempts to increase currency and credit by giving both back to the government in return for the commodity they are exchangeable for. As the supply of money increases, its value falls; or looked at the other way, the value of the commodity it is convertible into rises. When it rises above the fixed price, it is profitable for those holding credit (i.e., claims on the currency) to sell their debt for currency in order to buy the tangible asset from the government at below the market price. The selling of the credit and the taking of currency out of circulation cause credit to tighten and the value of the money to rise; on the other hand, the general price level of goods and services will fall. Its effect will be lower inflation and lower economic activity.

Since the value of money has fallen over time relative to the value of just about everything else, we could tie the currency to just about anything in order to show how this monetary system would have worked.

For example, since a one-pound loaf of white bread in 1946 cost 10 cents, let's imagine we tied the dollar to bread. In other words, let's imagine a monetary system in which the government in 1946 committed to buy bread at 10 cents a pound and stuck to that until now. Today a pound loaf of white bread costs \$2.75. Of course, if they had used this monetary system, the price couldn't have risen to \$2.75 because we all would have bought our bread from the government at 10 cents instead of from the free market until the government ran out of bread.

But, for our example, let's say that the price of bread is \$2.75. I'd certainly be willing to take all of my money, buy bread from the government at 10 cents and sell it in the market at \$2.75, and others would do the same. This process would reduce the amount of money in circulation, which would then reduce the prices of all goods and services, and it would increase the amount of bread in circulation (thus lowering its price more rapidly than other prices). In fact, if the supply and demand for bread were not greatly influenced by its convertibility to currency, this tie would have dramatically slowed the last 50 years' rapid growth in currency and credit.

Obviously, what the currency is convertible into has an enormous impact on this process. For example, if instead of tying the dollar to bread, we chose to tie it to eggs, since the price of a dozen eggs in 1947 was 70 cents and today it is about \$2.00, currency and credit growth would have been less restricted.

Ideally, if one has a commodity-based currency system, one wants to tie the currency to something that is not subject to great swings in supply or demand. For example, if the currency were tied to bread, bakeries would in effect have the power to produce money, leading to increased inflation. Gold and, to a much lesser extent, silver, have historically proven more stable than most other currency backings, although they are by no means perfect.

In the second type of monetary system – i.e., in a fiat system in which the amount of money is not constrained by the ability to exchange it for a commodity – the growth of money and credit is very much subject to the influence of the central bank and the willingness of borrowers and lenders to create credit.

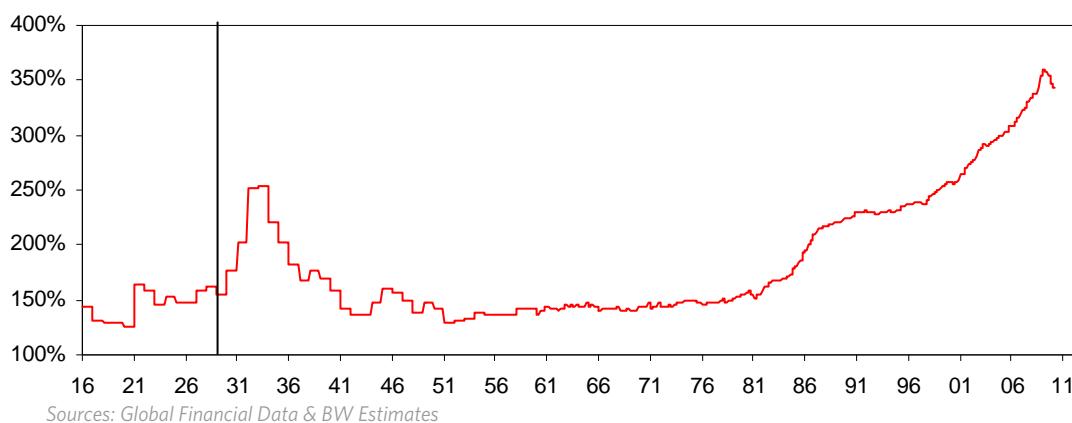
Governments typically prefer fiat systems because they offer more power to print money, expand credit and redistribute wealth by changing the value of money. Human nature being what it is, those in government (and those not) tend to value immediate gratification over longer-term benefits, so government policies tend to increase demand by allowing liberal credit creation, which leads to debt crises. Governments typically choose commodity-based systems only when they are forced to in reaction to the value of money having been severely depreciated due to the government's "printing" of a lot of it to relieve the excessive debt burdens that their unconstrained monetary systems allowed. They abandon commodity-based monetary systems when the constraints to money creation become too onerous in debt crises. So throughout history, governments have gone back and forth between commodity-based and fiat monetary systems in reaction to the painful consequences of each. However, they don't make these changes often, as monetary systems typically work well for many years, often decades, with central banks varying interest rates and money supplies to control credit growth well enough so that these inflection points are infrequently reached. In the next two sections I first describe the long-term debt cycle and then the short-term debt cycle.

## 2) The Long-Term Debt Cycle

As previously mentioned, when debts and spending rise faster than money and income, the process is self-reinforcing on the upside because rising spending generates rising incomes and rising net worths, which raise borrowers' capacity to borrow, which allows more buying and spending, etc. However, since debts can't rise faster than money and income forever there are limits to debt growth. Think of debt growth that is faster than income growth as being like air in a scuba bottle - there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. In the case of debt, you can take it out before you put it in (i.e., if you don't have any debt, you can take it out), but you are expected to return what you took out. When you are taking it out, you can spend more than is sustainable, which will give you the appearance of being prosperous. At such times, you and those who are lending to you might mistake you as being creditworthy and not pay enough attention to what your paying back will look like. When debts can no longer be raised relative to incomes and the time of paying back comes, the process works in reverse. It is that dynamic that creates long-term debt cycles. These long-term debt cycles have existed for as long as there has been credit. Even the Old Testament described the need to wipe out debt once every 50 years, which was called the year of Jubilee.

The next chart shows U.S. debt/GDP going back to 1916 and conveys the long-term debt cycle.

**Chart 2**  
**US Total Debt as a % of GDP**



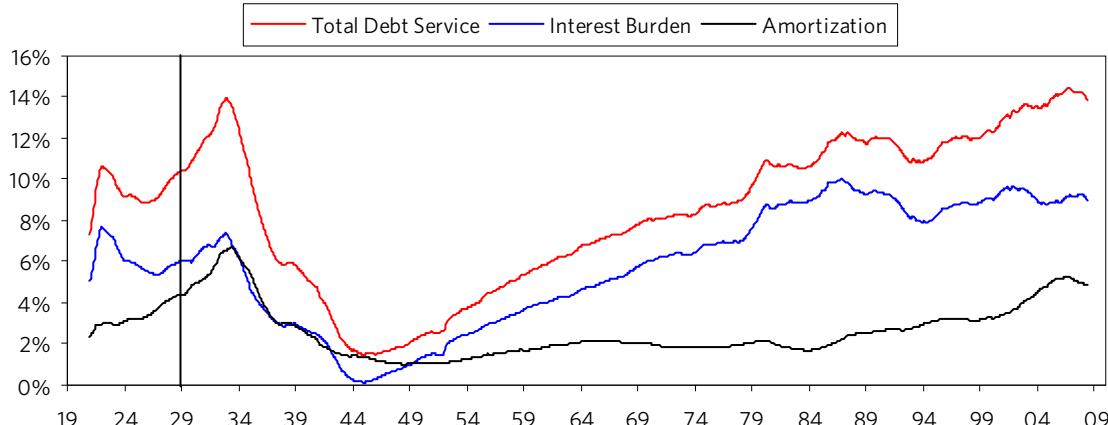
Upswings in the cycle occur, and are self-reinforcing, in a process by which money growth creates greater debt growth, which finances spending growth and asset purchases. Spending growth and higher asset prices allow even more debt growth. This is because lenders determine how much they can lend on the basis of the borrowers' 1) income/cash flows to service the debt and 2) net worth/collateral, as well as their own capacities to lend, and these rise in a self-reinforcing manner.

Suppose you earn \$100,000, have a net worth of \$100,000 and have no debt. You have the capacity to borrow \$10,000/year, so you could spend \$110,000 per year for a number of years, even though you only earn \$100,000. For an economy as a whole, this increased spending leads to higher earnings, which supports stock valuations and other asset values, giving people higher incomes and more collateral to borrow more against, and so on. In the up-wave part of the cycle, promises to deliver money (i.e., debt burdens) rise relative to both a) the supply of money and b) the amount of money and credit debtors have coming in (via incomes, borrowings and sales of assets). This up-wave in the cycle typically goes on for decades, with variations in it primarily due to central banks tightening and easing credit (which makes short-term debt cycles). But it can't go on forever.

Eventually the debt service payments become equal to or larger than the amount we can borrow and the spending must decline. When promises to deliver money (debt) can't rise any more relative to the money and credit coming in, the process works in reverse and we have deleveragings. Since borrowing is simply a way of pulling spending forward, the person spending \$110,000 per year and earning \$100,000 per year has to cut his spending to \$90,000 for as many years as he spent \$110,000, all else being equal.

While the last chart showed the amount of debt relative to GDP, the debt ratio, it is more precise to say that high debt service payments (i.e., principal and interest combined), rather than high debt levels, cause debt squeezes because cash flows rather than levels of debt create the squeezes that slow the economy. For example, if interest rates fall enough, debts can increase without debt service payments rising enough to cause a squeeze. This dynamic is best conveyed in the chart below. It shows interest payments, principal payments and total debt service payments of American households as a percentage of their disposable incomes going back to 1920. I am showing this debt service burden for the household sector because the household sector is the most important part of the economy; however, the concept applies equally well to all sectors and all individuals. As shown, the debt service burden of households has increased to the highest level since the Great Depression. What triggers reversals?

**Chart 3**  
**Household Debt Service (as % of Disposable Income)**



Sources: Global Financial Data & BW Estimates

The long-term debt cycle top occurs when 1) debt burdens are high and/or 2) monetary policy doesn't produce credit growth. From that point on, debt can't rise relative to incomes, net worth and money supply. That is when deleveraging – i.e., bringing down these debt ratios – begins. All deleveragings start because there is a shortage of money relative to debtors' needs for it. This leads to large numbers of businesses, households and financial institutions defaulting on their debts and cutting costs, which leads to higher unemployment and other problems. While these debt problems can occur for many reasons, most classically they occur because investment assets are bought at high prices and with leverage<sup>6</sup> – i.e., because debt levels are set on the basis of overly optimistic assumptions about future cash flows. As a result of this, actual cash flows fall short of what's required for debtors to service their debts. Ironically, quite often in the early stages the cash flows fall short because of tight monetary policies that are overdue attempts to curtail these bubble activities (buying overpriced assets with excessive leverage), so that the tight money triggers them (e.g., in 1928/29 in much of the world, in 1989/91 in Japan and in 2006/07 in much of the world). Also, ironically, inflation in financial assets is more dangerous than inflation in goods and services because this financial asset inflation appears like a good thing and

<sup>6</sup> This time around, residential and commercial real estate, private equity, lower grade credits and, to a lesser extent, listed equities were the assets that were bought at high prices and on lots of leverage. During both the U.S. Great Depression and the Japanese deleveraging, stocks and real estate were also the assets of choice that were bought at high prices and on leverage.

isn't prevented even though it is as dangerous as any other form of over-indebtedness. In fact, while debt-financed financial booms that are accompanied by low inflation are typically precursors of busts, at the time they typically appear to be investment-generated productivity booms (e.g., much of the world in the late 1920s, Japan in the late 1980s and much of the world in the mid 2000s).

Typically, though not always, interest rates decline in reaction to the economic and market declines and central banks easing, but they can't decline enough because they hit 0%. As a result, the ability of central banks to alleviate these debt burdens, to stimulate private credit growth and to cause asset prices to rise via lower interest rates is lost. These conditions cause buyers of financial assets to doubt that the value of the money they will get from owning this asset will be more than the value of the money they pay for it. Then monetary policy is ineffective in rectifying the imbalance.

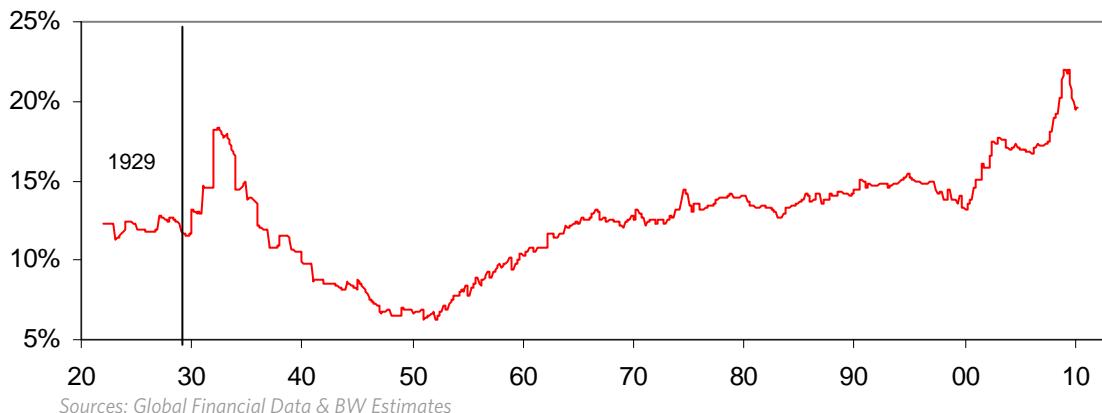
In deleveragings, rather than indebtedness increasing (i.e., debt and debt service rising relative to income and money), it decreases. This can happen in one of four ways: 1) debt reduction, 2) austerity, 3) transferring wealth from the haves to the have-nots and 4) debt monetization. Each one of these four paths reduces debt/income ratios, but they have different effects on inflation and growth. Debt reduction (i.e., defaults and restructurings) and austerity are both deflationary and depressing while debt monetization is inflationary and stimulative.

Transfers of wealth typically occur in many forms, but rarely in amounts that contribute meaningfully to the deleveraging. The differences between how deleveragings play out depends on the amounts and paces of these four measures.

Depressions are the contraction phase of the deleveraging process. Typically the "depression" phase of the deleveraging process comes at the first part of the deleveraging process, when defaults and austerity (i.e., the forces of deflation and depression) dominate. Initially, in the depression phase of the deleveraging process, the money coming in to debtors via incomes and borrowings is not enough to meet debtors' obligations; assets need to be sold and spending needs to be cut in order to raise cash. This leads asset values to fall, which reduces the value of collateral, and in turn reduces incomes. Because of both lower collateral values and lower incomes, borrowers' creditworthiness is reduced, so they justifiably get less credit, and so it continues in a self-reinforcing manner. Since the creditworthiness of borrowers is judged by both a) the values of their assets/collaterals (i.e., their net worths) in relation to their debts and b) the sizes of their incomes relative to the size of their debt service payments, and since both net worths and incomes fall faster than debts, borrowers become less creditworthy and lenders become more reluctant to lend. In this phase of the cycle the contraction is self-reinforcing at the same time as debt/income and debt/net-worth ratios rise. That occurs for two reasons. First, when debts cannot be serviced both debtors and creditors are hurt; since one man's debts are another man's assets, debt problems reduce net worths and borrowing abilities, thus causing a self-reinforcing contraction cycle. Second, when spending is curtailed incomes are also reduced, thus reducing the ability to spend, also causing a self-reinforcing contraction.

You can see debt burdens rise at the same time as the economy is in a deflationary depression in both chart 2 and chart 3. The vertical line on these charts is at 1929. As you can see in chart 2, the debt/GDP ratio shot up from about 160% to about 250% from 1929 to 1933. The vertical line in chart 3 shows the same picture - i.e., debt service levels rose relative to income levels because income levels fell. In the economic and credit downturn, debt burdens increase at the same time as debts are being written down, so the debt liquidation process is reinforced. Chart 4 shows the household sector's debt relative to its net worth. As shown, this leverage ratio shot up from already high levels, as it did during the Great Depression, due to declines in net worths arising from falling housing and stock prices.

**Chart 4**  
**USA Household Debt as a % of Net Worth**

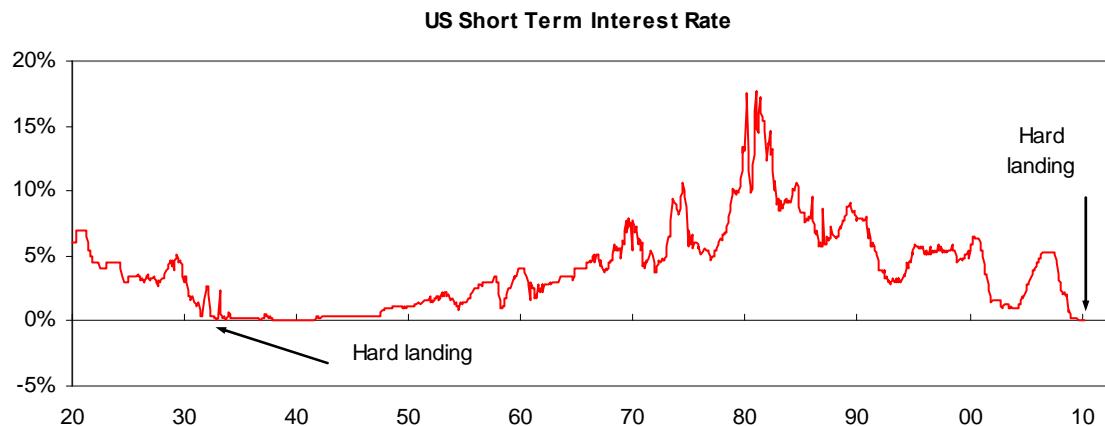


As mentioned earlier, in a credit-based economy, the ability to spend is an extension of the ability to borrow. For lending/borrowing to occur, lenders have to believe that a) they will get paid back an amount of money that is greater than inflation and b) they will be able to convert their debt into money. In deleveragings, lenders justifiably worry that these things will not happen.

Unlike in recessions, when cutting interest rates and creating more money can rectify this imbalance, in deleveragings monetary policy is ineffective in creating credit. In other words, in recessions (when monetary policy is effective) the imbalance between the amount of money and the need for it to service debt can be rectified by cutting interest rates enough to 1) ease debt service burdens, 2) stimulate economic activity because monthly debt service payments are high relative to incomes and 3) produce a positive wealth effect. However, in deleveragings, this can't happen. In deflationary depressions/deleveragings, monetary policy is typically ineffective in creating credit because interest rates hit 0% and can't be lowered further, so other, less effective ways of increasing money are followed. Credit growth is difficult to stimulate because borrowers remain over-indebted, making sensible lending impossible. In inflationary deleveragings, monetary policy is ineffective in creating credit because increased money growth goes into other currencies and inflation-hedge assets because investors fear that their lending will be paid back with money of depreciated value.

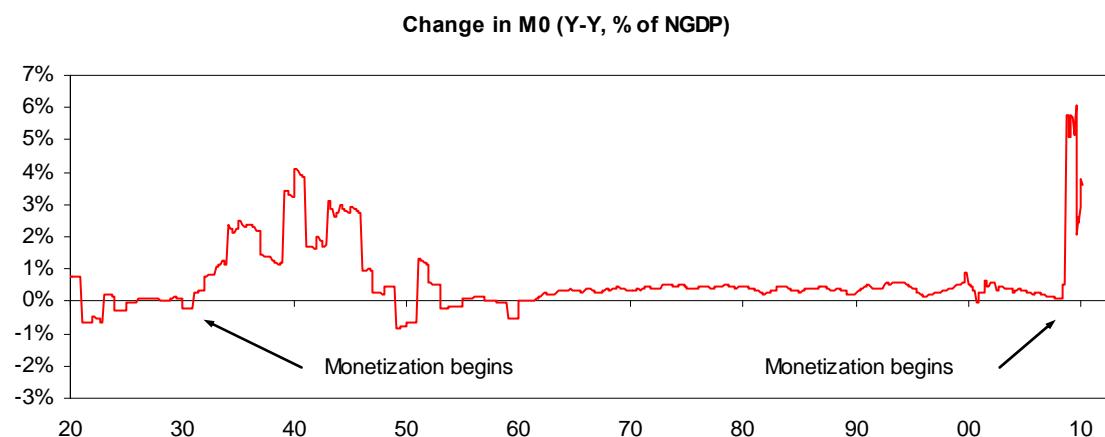
In order to try to alleviate this fundamental imbalance, governments inevitably a) create initiatives to encourage credit creation, b) ease the rules that require debtors to come up with money to service their debts (i.e., create forbearance) and, most importantly, c) print and spend money to buy goods, services and financial assets. The printing of and buying financial assets by central banks shows up in central banks' balance sheets expanding and the increased spending by central governments shows up in budget deficits exploding. This is shown in the following three charts.

As shown below, in 1930/32 and in 2007/08 short-term government interest rates hit 0%...

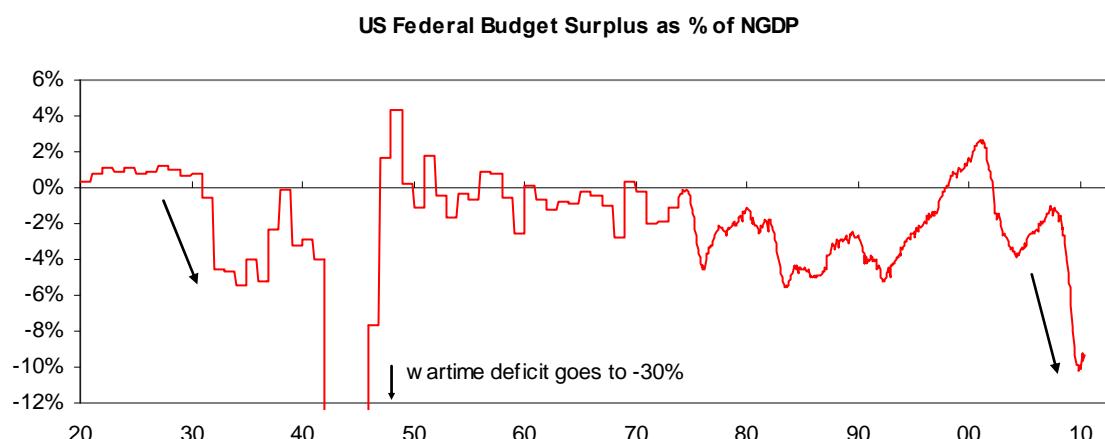


Sources: Global Financial Data & BW Estimates

...the Fed's production and spending of money grew...



...and budget deficits exploded...



Sources: Global Financial Data & BW Estimates for charts above

You can tell deleveragings by these three things occurring together, which does not happen at other times.

Typically, though not necessarily, these moves come in progressively larger dosages as initial dosages of these sorts fail to rectify the imbalance and reverse the deleveraging process. However, these dosages do typically cause temporary periods of relief that are manifest in bear market rallies in financial assets and increased economic activity. For example, in the Great Depression there were six big rallies in the stock market (of between 21% and 48%) in a bear market that totaled 89%, with all of these rallies triggered by these sorts of increasingly strong dosages of government actions that were intended to reduce the fundamental imbalance.

That is because a return to an environment of normal capital formation and normal economic activity can occur only by eliminating this fundamental imbalance so that capable providers of capital (i.e., investors/lenders) willingly choose to give money to capable recipients of capital (borrowers and sellers of equity) in exchange for believable claims that they will get back an amount of money that is worth more than they gave. Eventually there is enough "printing of money" or debt monetization to negate the deflationary forces of both debt reduction and austerity. When a good balance of debt reduction, austerity, and "printing/monetizing" occurs, debt burdens can fall relative to incomes with positive economic growth. In the U.S. deleveraging of the 1930s, this occurred from 1933 to 1937.

Some people mistakenly think that the depression problem is just psychological: that scared investors move their money from riskier investments to safer ones (e.g., from stocks and high-yield lending to government cash), and that problems can be rectified by coaxing them to move their money back into riskier investments. This is wrong for two reasons. First, contrary to popular thinking, the deleveraging dynamic is not primarily psychologically driven. It is primarily driven by the supply and demand of and relationships between credit, money and goods and services. If everyone went to sleep and woke up with no memories of what had happened, we would all soon find ourselves in the same position. That is, because debtors still couldn't service their debts, because their obligations to deliver money would still be too large relative to the money they are taking in, the government would still be faced with the same choices that would still have the same consequences, etc. Related to this, if the central bank produces more money to alleviate the shortage, it will cheapen the value of money, thus not rectifying creditors' worries about being paid back an amount of money that is worth more than they gave. Second, it is not correct that the amount of money in existence remains the same and has simply moved from riskier assets to less risky ones. Most of what people think is money is really credit, and it does disappear. For example, when you buy something in a store on a credit card, you essentially do so by saying, "I promise to pay."

Together you created a credit asset and a credit liability. So where did you take the money from? Nowhere. You created credit. It goes away in the same way. Suppose the store owner justifiably believes that you and others might not pay the credit card company and that the credit card company might not pay him if that happens. Then he correctly believes that the "asset" he has isn't really there. It didn't go somewhere else.

As implied by this, a big part of the deleveraging process is people discovering that much of what they thought was their wealth isn't really there. When investors try to convert their investments into money in order to raise needed cash, the liquidity of their investments is tested and, in cases in which the investments prove illiquid, panic-induced "runs" and sell-offs of their securities occur. Naturally those who experience runs, especially banks (though this is true of most entities that rely on short-term funding), have problems raising money and credit to meet their needs, so they often fail. At such times, governments are forced to decide which ones to save by providing them with money and whether to get this money through the central government (i.e., through the budget process) or through the central bank "printing" more money. Governments inevitably do both, though in varying degrees. What determines whether deleveragings are deflationary or inflationary is the extent to which central banks create money to negate the effects of contracting credit.

Governments with commodity-based monetary systems or pegged currencies are more limited in their abilities to "print" and provide money, while those with independent fiat monetary systems are less constrained. However, in both cases, the central bank is eager to provide money and credit, so it always lowers the quality of the

collateral it accepts and, in addition to providing money to some essential banks, it also typically provides money to some non-bank entities it considers essential.

The central bank's easing of monetary policy and the movement of investor money to safer investments initially drives down short-term government interest rates, steepens the yield curve and widens credit and liquidity premiums. Those who do not receive money and/or credit that is needed to meet their debt service obligations and maintain their operations, which is typically a large segment of debtors, default and fail.

In depressions, as credit collapses, workers lose jobs and many of them, having inadequate savings, need financial support. So in addition to needing money to provide financial support to the system, governments need money to help those in greatest financial need. Additionally, to the extent that they want to increase spending to make up for decreased private sector spending, they need more money. At the same time, their tax revenue falls because incomes fall. For these reasons, governments' budget deficits increase. Inevitably, the amount of money lent to governments at these times increases less than their needs (i.e., they have problems funding their deficits), despite the increased desire of lenders to buy government securities to seek safety at these times. As a result, central banks are again forced to choose between "printing" more money to buy their governments' debts or allowing their governments and their private sector to compete for the limited supply of money, thus allowing extremely tight money conditions.

Governments with commodity-based money systems are forced to have smaller budget deficits and tighter monetary policies than governments with fiat monetary systems, though they all eventually relent and print more money (i.e., those on commodity-based monetary systems either abandon these systems or change the amount/pricing of the commodity that they will exchange for a unit of money so that they print more, and those on fiat systems will just print more). This "printing" of money takes the form of central bank purchases of government securities and non-government assets such as corporate securities, equities and other assets. In other words, the government "prints" money and uses it to negate some of the effects of contracting credit. This is reflected in money growing at an extremely fast rate at the same time as credit and real economic activity contract. Traditional economists see that as the velocity of money declining, but it's nothing of the sort. If the money creation is large enough, it devalues the currency, lowers real interest rates and drives investors from financial assets to inflation-hedge assets. This typically happens when investors want to move money outside the currency, and short-term government debt is no longer considered a safe investment.

Because governments need more money, and since wealth and incomes are typically heavily concentrated in the hands of a small percentage of the population, governments raise taxes on the wealthy. Also, in deleveragings, those who earned their money in the booms, especially the capitalists who made a lot of money working in the financial sector helping to create the debt (and especially the short sellers who some believe profited at others' expense), are resented. Tensions between the "haves" and the "have-nots" typically increase and, quite often, there is a move from the right to the left. In fact, there is a saying that essentially says "in booms everyone is a capitalist and in busts everyone is a socialist." For these various reasons, taxes on the wealthy are typically significantly raised. These increased taxes typically take the form of greater income and consumption taxes because these forms of taxation are the most effective in raising revenues. While sometimes wealth and inheritance taxes are also increased,<sup>7</sup> these typically raise very little money because much wealth is illiquid and, even for liquid assets, forcing the taxpayer to sell financial assets to make their tax payments undermines capital formation. Despite these greater taxes on the wealthy, increases in tax revenue are inadequate because incomes - both earned incomes and incomes from capital - are so depressed, and expenditures on consumption are reduced.

The wealthy experience a tremendous loss of "real" wealth in all forms - i.e., from their portfolios declining in value, from their earned incomes declining and from higher rates of taxation, in inflation-adjusted terms. As a result, they become extremely defensive. Quite often, they are motivated to move their money out of the country

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<sup>7</sup> The extent to which wealth taxes can be applied varies by country. For example, they have been judged to be unconstitutional in the U.S. but have been allowed in other countries.

(which contributes to currency weakness), illegally dodge taxes and seek safety in liquid, non-credit-dependent investments.

Workers losing jobs and governments wanting to protect them become more protectionist and favor weaker currency policies. Protectionism slows economic activity, and currency weakness fosters capital flight. Debtor countries typically suffer most from capital flight.

When money leaves the country, central banks are once again put in the position of having to choose between "printing" more money, which lessens its value, and not printing money in order to maintain its value but allowing money to tighten. They inevitably choose to "print" more money. This is additionally bearish for the currency. As mentioned, currency declines are typically acceptable to governments because a weaker currency is stimulative for growth and helps to negate deflationary pressures. Additionally, when deflation is a problem, currency devaluations are desirable because they help to negate it.

Debtor, current account deficit countries are especially vulnerable to capital withdrawals and currency weakness as foreign investors also tend to flee due to both currency weakness and an environment inhospitable to good returns on capital. However, this is less true for countries that have a great amount of debt denominated in their own currencies (like the United States in the recent period and in the Great Depression) as these debts create a demand for these currencies. Since debt is a promise to deliver money that one doesn't have, this is essentially a short squeeze that ends when a) the shorts are fully squeezed (i.e., the debts are defaulted on) and/or b) enough money is created to alleviate the squeeze, and/or c) the debt service requirements are reduced in some other way (e.g., forbearance).

The risk at this stage of the process is that the currency weakness and the increased supply of money will lead to short-term credit (even government short-term credit) becoming undesirable, causing the buying of inflation-hedge assets and capital flight rather than credit creation. For foreign investors, receiving an interest rate that is near 0% and having the foreign currency that their deposits are denominated in decline produces a negative return; so this set of circumstances makes holding credit, even government short-term credit, undesirable.

Similarly, for domestic investors, this set of circumstances makes foreign currency deposits more desirable. If and when this happens, investors accelerate their selling of financial assets, especially debt assets, to get cash in order to use this cash to buy other currencies or inflation-hedge assets such as gold. They also seek to borrow cash in that local currency. Once again, that puts the central bank in the position of having to choose between increasing the supply of money to accommodate this demand for it or allowing money and credit to tighten and real interest rates to rise. At such times, sometimes governments seek to curtail this movement by establishing foreign exchange controls and/or prohibiting gold ownership. Also, sometimes price and wage controls are put into place. Such moves typically create economic distortions rather than alleviate problems.

Though the deleveraging process, especially the depression phase of it, seems horrible and certainly produces great hardships – in some cases, even wars – it is the free market's way of repairing itself. In other words, it gets the capital markets and the economy into a much healthier condition by rectifying the fundamental imbalance.

Debts are reduced (through bankruptcies and other forms of debt restructuring), businesses' break-even levels are reduced through cost-cutting, the pricing of financial assets becomes cheap, and the supply of money to buy the assets and to service debts is increased by the central banks – so capital formation becomes viable again.

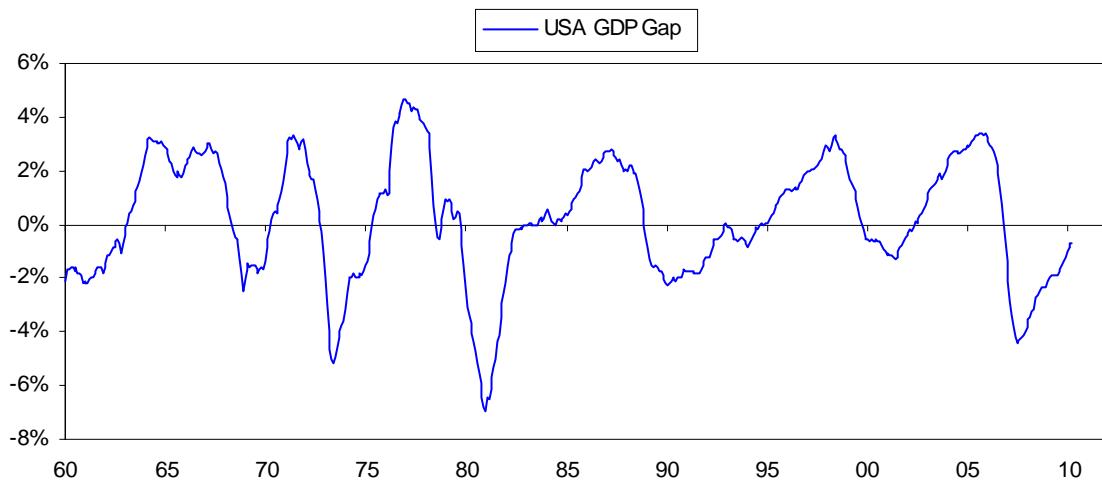
Deleveragings typically end via a mix of 1) debt reduction, 2) austerity, 3) redistributions of wealth, and 4) debt monetization. Additionally, through this process, businesses lowering their break-even levels through cost-cutting, substantial increases in risk and liquidity premiums that restore the economics of capital formation (i.e., lending and equity investing), and nominal interest rates being held under nominal growth rates typically occur.

The decline in economic and credit creation activity (the depression phase) is typically fast, lasting two to three years. However, the subsequent recovery in economic activity and capital formation tends to be slow, so it takes

roughly a decade (hence the term “lost decade”) for real economic activity to reach its former peak level. Though it takes about a decade to return the economy to its former peak levels, it typically takes longer for real stock prices to reach former highs, because equity risk premiums take a very long time to reach pre-deleveraging lows. During this time nominal interest rates must be kept below nominal growth rates to reduce the debt burdens. If interest rates are at 0% and there is deflation, central banks must “print” enough money to raise nominal growth. As mentioned, these cycles are due to human nature and the way the system works. Throughout this process, most everyone behaves pretty much as you’d expect in pursuing their self-interest, thus reacting to and causing developments in logical ways, given how the economic machine works.

### 3) The Short-Term Debt Cycle

The short-term debt cycle, also known as the business cycle, is primarily controlled by central banks’ policies that a) tighten when inflation is too high and/or rising uncomfortably because there isn’t much slack in the economy (as reflected in the GDP gap, capacity utilization and the unemployment rate) and credit growth is strong; and b) ease when the reverse conditions exist. The cycles in the U.S. since 1960 are shown below.



These cycles can be described a bit differently by different people, but they are all about the same. They typically occur in six phases – four in the expansion and two in the recession.

The expansion phase of the cycle:

The “early-cycle” (which typically lasts about five or six quarters), typically begins with the demand for interest rate sensitive items (e.g., housing and cars) and retail sales picking up because of low interest rates and lots of available credit. It is also supported by prior inventory liquidations stopping and inventory rebuilding starting. This increased demand and rising production pulls the average workweek and then employment up. Credit growth is typically fast, economic growth is strong (i.e., in excess of 4%), inflation is low, growth in consumption is strong, the rate of inventory accumulation is increasing, the U.S. stock market is typically the best investment (because there is fast growth and interest rates aren’t rising because inflation isn’t rising) and inflation-hedge assets and commodities are the worst-performing assets.

This is typically followed by what I call the “mid-cycle” (which lasts an average of three or four quarters) when economic growth slows substantially (i.e., to around 2%), inflation remains low, growth in consumption slows, the rate of inventory accumulation declines, interest rates dip, the stock market rate of increase tapers off, and the rate of decline in inflation-hedge assets slows.

This in turn is followed by the "late-cycle" (which typically begins about two and a half years into expansion, depending on how much slack existed in the economy at the last recession's trough). At this point, economic growth picks up to a moderate pace (i.e., around 3.5-4%), capacity constraints emerge, but credit and demand growth are still strong. So, inflation begins to trend higher, growth in consumption rises, inventories typically pick up, interest rates rise, the stock market stages its last advance and inflation-hedge assets become the best-performing investments.

This is typically followed by the tightening phase of the expansion. In this phase, actual or anticipated acceleration of inflation prompts the Fed to turn restrictive, which shows up in reduced liquidity, interest rates rising and the yield curve flattening or inverting. This, in turn, causes money supply and credit growth to fall and the stock market to decline before the economy turns down.

The recession phase of the cycle follows and occurs in two parts.

In the early part of the recession, the economy contracts, slack returns (as measured by the GDP gap, capacity utilization and the unemployment rate), stocks, commodities and inflation-hedge assets fall and inflation declines because the Fed remains tight.

In the late part of the recession, the central bank eases monetary policy as inflation concerns subside and recession concerns grow. So interest rates decline and the lower interest rates cause stock prices to rise (even though the economy hasn't yet turned up) while commodity prices and inflation-hedge assets continue to be weak. The lower interest rates and higher stock prices set the stage for the expansion part of the cycle to begin.

Although I have referred to average time lags between each of these stages of the cycle, as mentioned from the outset, it is the sequence of events, not the specific timeline, which is important to keep an eye on. For example, given the previously described linkages, inflation doesn't normally heat up until the slack in the economy is largely eliminated, and the Fed doesn't normally turn restrictive until inflation rises. An expansion that starts off after a deep recession (i.e., one that produces lots of slack) is bound to last longer than an expansion that begins with less excess capacity. Similarly, as the cycle progresses through its various stages as a function of the sequences just described, the rate at which it progresses will be a function of the forcefulness of the influences that drive its progression. For example, an expansion that is accompanied by an aggressively stimulative central bank is likely to be stronger and evolve more quickly than one that is accompanied by a less stimulative monetary policy. Also, exogenous influences such as China's entry into the world economy, wars and natural disasters can alter the progressions of these cycles. What I am providing is a description of the classic template: not all cycles manifest precisely as described.

For the sake of brevity, I won't go into great depth about short-term debt cycles here.

## The Interaction of These Three Forces

While the economy is more complicated than this Template suggests, laying the short-term debt cycle on top of the long-term debt cycle and then laying them both on top of the productivity line gives a good conceptual roadmap for understanding the market-based system and seeing both where the economy is now and where it is probably headed. For the sake of brevity, I won't digress into a complete explanation of this. But I will give an example.

Example: The table below shows each of the cyclical peaks and troughs in the Fed funds rate, when they occurred, the magnitudes of changes up and the magnitudes of the changes down (in both basis point terms and percentage terms), since 1919. These are the interest rate changes that caused all of the recessions and expansions over the last 90 years. This table shows 15 cyclical increases and 15 cyclical decreases. Note that these swings were around one big uptrend and one big downtrend. Specifically, note that from the September 1932 low (at 0%) until the May 1981 high (at 19%), every cyclical low in interest rates was above the prior cyclical low and every cyclical high was above the prior cyclical high - i.e., all of the cyclical increases and decreases were around that 50-year uptrend. And note that from the May 1981 high in the Fed funds rate (at 19%), until the March 2009 low in the Fed funds rate (0%), every cyclical low in the Fed funds rate was lower than the prior low and every cyclical high in interest rates was below the prior cyclical high - i.e., all of the cyclical increases and all of the cyclical decreases were around a 27-year downtrend. Each cyclical decline in interest rates incrementally reduced debt service payments, lowered the de-facto purchase prices of items bought on credit to make them more affordable and boosted the value of assets a notch (having a positive wealth effect). So, debt continued to rise relative to income and money, though the trend in debt service payments was essentially flat, until interest rates hit 0% and this could not longer continue, at which time the government had to print and spend a lot of money to make up for the reduced private sector credit creation and spending.

| Fed Funds Rates <sup>1</sup> |         |                  |                       |               |        |        |
|------------------------------|---------|------------------|-----------------------|---------------|--------|--------|
| Low                          | Date    | Nominal Change   | Period<br>(in months) | % Change      | High   | Date   |
| 3.96%                        | Oct-19  | 1.92%<br>-3.96%  | 14<br>43              | 49%<br>-67%   | 5.88%  | Dec-20 |
| 1.92%                        | Jul-24  | 2.88%<br>-4.80%  | 64<br>34              | 150%<br>-100% | 4.80%  | Nov-29 |
| 0.0%                         | Sep-32  | 2.09%<br>-1.44%  | 251<br>10             | #N/A<br>-69%  | 2.1%   | Aug-53 |
| 0.65%                        | Jun-54  | 2.94%<br>-2.71%  | 40<br>8               | 452%<br>-75%  | 3.59%  | Oct-57 |
| 0.88%                        | Jun-58  | 3.69%<br>-2.30%  | 18<br>19              | 419%<br>-50%  | 4.57%  | Dec-59 |
| 2.27%                        | Jul-61  | 3.32%<br>-2.26%  | 62<br>9               | 146%<br>-40%  | 5.59%  | Sep-66 |
| 3.33%                        | Jun-67  | 4.75%<br>-4.08%  | 30<br>26              | 143%<br>-50%  | 8.08%  | Dec-69 |
| 4.00%                        | Feb-72  | 7.00%<br>-6.25%  | 28<br>30              | 175%<br>-57%  | 11.00% | Jun-74 |
| 4.75%                        | Dec-76  | 11.75%<br>-5.50% | 39<br>5               | 247%<br>-33%  | 16.50% | Mar-80 |
| 11.00%                       | Aug-80  | 8.00%<br>-11.00% | 9<br>18               | 73%<br>-58%   | 19.00% | May-81 |
| 8.00%                        | Nov-82  | 3.44%<br>-5.56%  | 21<br>26              | 43%<br>-49%   | 11.44% | Aug-84 |
| 5.88%                        | Oct-86  | 3.87%<br>-6.75%  | 31<br>40              | 66%<br>-69%   | 9.75%  | May-89 |
| 3.00%                        | Sep-92  | 3.50%<br>-5.50%  | 99<br>30              | 117%<br>-85%  | 6.50%  | Dec-00 |
| 1.00%                        | Jun-03  | 4.25%<br>-3.00%  | 50<br>13              | 425%<br>-57%  | 5.25%  | Aug-07 |
| 0 - 0.25%                    | Current |                  |                       |               |        |        |

(1) Prior to 1975, T-Bill used as proxy for Fed Funds target rate

|                    |                 |          |  |
|--------------------|-----------------|----------|--|
| Avg Increases      | 4.53%           | 54       |  |
| Range of Increases | 1.9% to 11.8%   | 9 to 251 |  |
| Avg Decreases      | -4.65%          | 22       |  |
| Range of Decreases | -11.0% to -1.4% | 5 to 43  |  |

Again, for the sake of brevity, I won't go into greater depth about the three forces' interactions here. As mentioned at the outset, this chapter is meant to just to give you a brief explanation of how I believe the economic machine works. For those who are inclined to learn more, the following chapters: "II. Debt Cycles: Leveragings & Deleveragings" and "III. Productivity and Structural Reform: Why Countries Succeed & Fail, and What Should Be Done So Failing Countries Succeed," examine these processes in much greater depth. In chapter II, "An In-Depth Look at Deleveragings" reviews the mechanics of deleveragings across a number of cases and why some are beautiful and others ugly. The chapter concludes with detailed timelines of two classic deflationary and inflationary deleveragings – the U.S. deleveraging of the 1930s and the Weimar Republic deleveraging of the 1920s – to make clear the important cause and effect relationships at work and to convey an up-close feeling of what it was like to go through the experiences as an investor. Chapter III has two parts: "Part 1: The Formula for Economic Success", "Part 2: Economic Health Indices by Country, and the Prognoses that They Imply" and "Part 3: The Rises and Declines of Economies Over the Last 500 Years". The first discusses how different countries' shares of the world economy have changed and why these changes occurred. The second examines in more depth the drivers of long term growth, the logic behind them, and what they say about the economic health of countries today.

# Debt Cycles: Leveragings & Deleveragings

# An In-Depth Look at Deleveragings

The purpose of this paper is to show the compositions of past deleveragings and, through this process, to convey in-depth, how the deleveraging process works.

The deleveraging process reduces debt/income ratios. When debt burdens become too large, deleveragings must happen. These deleveragings can be well managed or badly managed. Some have been very ugly (causing great economic pain, social upheaval and sometimes wars, while failing to bring down the debt/income ratio), while others have been quite beautiful (causing orderly adjustments to healthy production-consumption balances in debt/income ratios). In this study, I review the mechanics of deleveragings by showing how a number of past deleveragings transpired in order to convey that some are ugly and some are beautiful. What you will see is that beautiful deleveragings are well balanced and ugly ones are badly imbalanced. The differences between how deleveragings are resolved depend on the amounts and paces of 1) debt reduction, 2) austerity, 3) transferring wealth from the haves to the have-nots and 4) debt monetization. What I am saying is that beautiful ones balance these well and ugly ones don't and what I will show below is how.

Before I examine these, I will review the typical deleveraging process.

## The Typical Deleveraging Process

Typically, deleveragings are badly managed because they come along about once in every lifetime and policy makers haven't studied them. As a result, they usually set policies like blind men trying to cook on a hot stove, through a painful trial and error process in which the pain of their mistakes drives them away from the bad moves toward the right moves. Since everyone eventually gets through the deleveraging process, the only question is how much pain they endure in the process. Because there have been many deleveragings throughout history to learn from, and because the economic machine is a relatively simple thing, a lot of pain can be avoided if they understand how this process works and how it has played out in past times. That is the purpose of this study.

As previously explained, the differences between deleveragings depend on the amounts and paces of 1) debt reduction, 2) austerity, 3) transferring wealth from the haves to the have-nots, and 4) debt monetization. Each one of these four paths reduces debt/income ratios, but they have different effects on inflation and growth. Debt reduction (i.e., defaults and restructurings) and austerity are both deflationary and depressing while debt monetization is inflationary and stimulative. Ugly deleveragings get these out of balance while beautiful ones properly balance them. In other words, the key is in getting the mix right.

Typically, in response to a debt crisis the going to these four steps takes place in the following order:

- 1) At first, problems servicing debt and the associated fall off in debt growth cause an economic contraction in which the debt/income ratios rise at the same time as economic activity and financial asset prices fall. I will call this phase an "ugly deflationary deleveraging". Debt reduction (i.e., defaults and restructurings) and austerity without material debt monetization characterize this phase. During this period, the fall in private sector credit growth and the tightness of liquidity lead to declines in demand for goods, services and financial assets. The financial bubble bursts when there is not enough money to service the debt and **debt defaults and restructurings** hit people, especially leveraged lenders (banks), like an avalanche that causes fears. These justified fears feed on themselves and lead to a liquidity crisis. As a result, policy makers find themselves in a mad scramble to contain the defaults before they spin out of control. This path to reducing debt burdens (i.e., debt defaults and restructurings) must be limited because it would otherwise lead to a

self-reinforcing downward spiral in which defaults and restructurings can be so damaging to confidence that, if let go, they might prevent faith and recoveries from germinating for years.

Defaults and restructurings cannot be too large or too fast because one man's debts are another man's assets, so the wealth effect of cutting the value of these assets aggressively can be devastating on the demands for goods, services and investment assets. Since in order to reduce debt service payments to sustainable levels the amount of write-down must equal what is required so the debtor will be able to pay (e.g., let's say it's 30% less), a write-down will reduce the creditor's asset value by that amount (e.g. 30%). While 30% sounds like a lot, since many entities are leveraged, the impacts on their net worths can be much greater. For example, the creditor who is leveraged 2:1 would experience a 60% decline in his net worth. Since banks are typically leveraged about 12 or 15:1, that picture is obviously devastating for them. This is usually apparent from the outset of the deleveragings. Since the devastating forcefulness of the wave of defaults that occurs in a deleveraging is apparent from the outset, policy makers are typically immediately motivated to contain the rate of defaults, though they typically don't know the best ways to do that.

In reaction to the shock of the debt crisis, policy makers typically try **austerity** because that's the obvious thing to do. Since it is difficult for the debtor to borrow more, and since it's clear that he already has too much debt, it's obvious that he has to cut his spending to bring it back in line with his income. The problem is that one man's spending is another man's income, so when spending is cut, incomes are also cut, so it takes an awful lot of painful spending cuts to make significant reductions to debt/income ratios. Normally policy makers play around with this path for a couple of years, get burned by the results, and eventually realize that more must be done because the deflationary and depressing effects of both debt reduction and austerity are too painful. That leads them to go to the next phase in which "printing money" plays a bigger role. I don't mean to convey that debt reductions and austerity don't play beneficial roles in the deleveraging process because they do - just not big enough roles to make much of a difference and with too painful results unless balanced with "printing money/monetization".

- 2) In the second phase of the typical deleveraging the debt/income ratios decline at the same time as economic activity and financial asset prices improve. This happens because there is enough "printing of money/debt monetization" to bring the nominal growth rate above the nominal interest rate and a currency devaluation to offset the deflationary forces. This creates a "beautiful deleveraging". The best way of negating the deflationary depression is for the central bank to provide adequate liquidity and credit support and, depending on different key entities' need for capital, for the central government to provide that too. This takes the form of the central bank both lending against a wider range of collateral (both lower quality and longer maturity) and buying (monetizing) lower-quality and/or longer-term debt. This produces relief and, if done in the right amounts, allows a deleveraging to occur with positive growth. The right amounts are those that a) neutralize what would otherwise be a deflationary credit market collapse and b) get the nominal growth rate marginally above the nominal interest rate to tolerably spread out the deleveraging process. At such times of reflation, there is typically currency weakness, especially against gold, but this will not produce unacceptably high inflation because the reflation is simply negating the deflation. History has shown that those who have done it quickly and well (like the US in 2008/9) have derived much better results than those who did it late (like the US in 1930-33). However, there is such a thing as abusive use of stimulants. Because stimulants work so well relative to the alternatives, there is a real risk that they can be abused, causing an "ugly inflationary deleveraging".
- 3) When there is too much "printing of money/monetization" and too severe a currency devaluation (which are reflationary) relative to the amounts of the other three alternatives "ugly inflationary deleveragings" can occur. When these happen a) they either occur quickly in countries that don't have reserve currencies, that have significant foreign currency denominated debts and in which the inflation rate is measured in their rapidly depreciating local currency, and b)

they can occur slowly and late in the deleveraging process of reserve currency countries, after a long time and a lot of stimulation that is used to reverse a deflationary deleveraging.

By the way, **transfers of wealth** from the have to the have-nots typically occur in many forms (e.g., increased taxes on the wealthy, financial support programs such as those the "rich" European countries are providing to the overly indebted ones, etc.) throughout the process, but they rarely occur in amounts that contribute meaningfully to the deleveraging (unless there are "revolutions").

Now let's take a look at some past deleveragings so we can see these things happening.

## Past Deleveragings

While there are dozens of deleveragings that I could have picked, I chose seven – 1) the US in the 1930s, 2) Japan in the 1930s, 3) the UK in the '50s and '60s, 4) Japan over the past two decades, 5) the US 2008-now, 6) Spain now and 7) the Weimar Republic in the 1920s – because they are both important and different in interesting ways. As you will see, while they are different because the amounts and paces of the four paths to deleveraging were different, "the economic machines" that drove the outcomes were basically the same.

I am going to begin by looking at the first six and then turn our attention to the Weimar Republic's inflationary deleveraging.

I will break these down into three groups, which I will call:

- 1) "ugly deflationary deleveragings" (which occurred before enough money was "printed" and deflationary contractions existed and when nominal interest rates were above nominal growth rates),
- 2) "beautiful deleveragings" (those in which enough "printing" occurred to balance the deflationary forces of debt reduction and austerity in a manner in which there is positive growth, a falling debt/income ratio and nominal GDP growth above nominal interest rates), and
- 3) "ugly inflationary deleveragings" (in which the "printing" is large relative to the deflationary forces and nominal growth through monetary inflation and interest rates are in a self-reinforcing upward spiral).

## The Ugly Deflationary Deleveragings (i.e., when the economy was bad while the debt/income ratio rose)

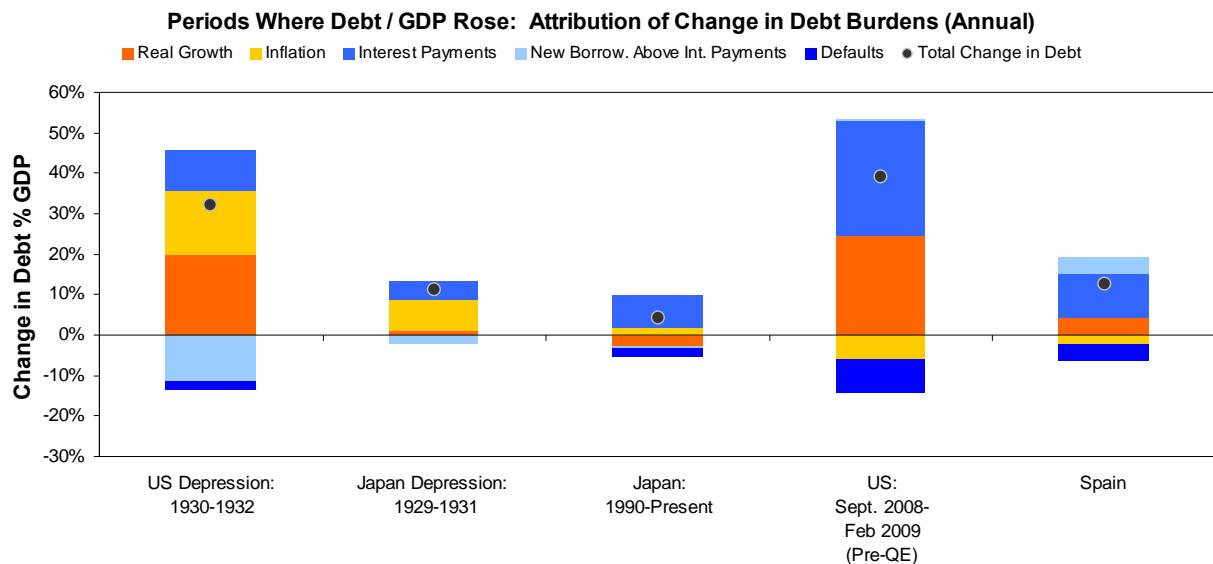
As shown below, in all of these cases, a) money printing was limited, b) nominal growth was below nominal rates, c) the currency was generally strong, and d) the debt/income ratios rose because of the combination of interest payment costs and nominal incomes falling or stagnating.

| Monetary Policy in Deleveragings                        | US Depression:<br>1930-1932 | Japan Depression:<br>1929-1931 | Japan:<br>1990-Present | US:<br>July 2008-Feb 2009<br>(Pre-QE) | Spain:<br>07/08-Present |
|---|-----------------------------|--------------------------------|------------------------|---------------------------------------|-------------------------|
| Nominal GDP Growth - Gov't Bond Yield                   | -20.4%                      | -13.7%                         | -2.0%                  | -8.7%                                 | -5.5%                   |
| Nominal GDP Growth                                      | -17.0%                      | -8.6%                          | 0.6%                   | -5.4%                                 | -0.5%                   |
| GDP Deflator  | -8.0%                       | -7.4%                          | -0.5%                  | 2.0%                                  | 0.6%                    |
| Real  | -9.0%                       | -1.2%                          | 1.1%                   | -7.2%                                 | -1.1%                   |
| Gov't Bond Yield, Avg.                                  | 3.4%                        | 5.1%                           | 2.6%                   | 3.4%                                  | 5.0%                    |
| M0 Growth % GDP, Avg. Ann.                              | 0.4%                        | -1.0%                          | 0.7%                   | 3.1%                                  | 3.6%*                   |
| Central Bank Asset Purchases & Lending, 10yr Dur., Ann. | 0.4%                        | ---                            | 0.1%                   | 0.5%                                  | 2.0%*                   |
| FX v. Price of Gold (+ means rally v. gold), Ann        | 0.0%                        | 2.7%                           | -3.5%                  | -3.2%                                 | -20.0%                  |
| FX v. USD (TWI for USA), Ann                            | 2.9%                        | 2.7%                           | 2.9%                   | 40.2%                                 | -4.9%                   |
| Total Debt level as % GDP: Starting Point               | 155%                        | 74%                            | 403%                   | 342%                                  | 348%                    |
| Total Debt level as % GDP: Ending Point                 | 252%                        | 107%                           | 498%                   | 368%                                  | 389%                    |
| Change in Total Debt (% GDP)                            | 96%                         | 33%                            | 95%                    | 27%                                   | 41%                     |
| Change in Total Debt (% GDP), Ann.                      | 32%                         | 11%                            | 4%                     | 40%                                   | 13%                     |

\*For ESP, ECB lending to ESP and ECB purchases of ESP assets is shown.

Sources: Global Financial Data & BW Estimates

The following charts attribute the changes in debt/GDP. More specifically, a black dot conveys the total annualized change in debt/GDP. Each bar breaks up the attribution of this change into the following pieces: changes in GDP (i.e., income) and changes in the nominal value of the debt stock. Income changes are broken into (1) real income changes and (2) inflation. A decline in real GDP shows up as a positive contribution to debt/GDP in the shaded region, while an increase in inflation shows up as a negative contribution. Changes in nominal debt levels are broken into (3) defaults, (4) the amount of new borrowing required just to make interest payments, and (5) whatever increases or decreases in borrowing that occur beyond that. So, defaults show up as negatives, while interest payments show up as positives and new borrowing beyond interest payments as positives or negatives (depending on whether new debt was created or paid down).



Note: For the Japan in the 1930s case, we do not have reliable default data, so "New Borrowing above Int. Payments" is net of defaults in that case.

## The Beautiful Deleveragings (i.e., when the economy was growing in a balanced way with the debt/income ratio declining)

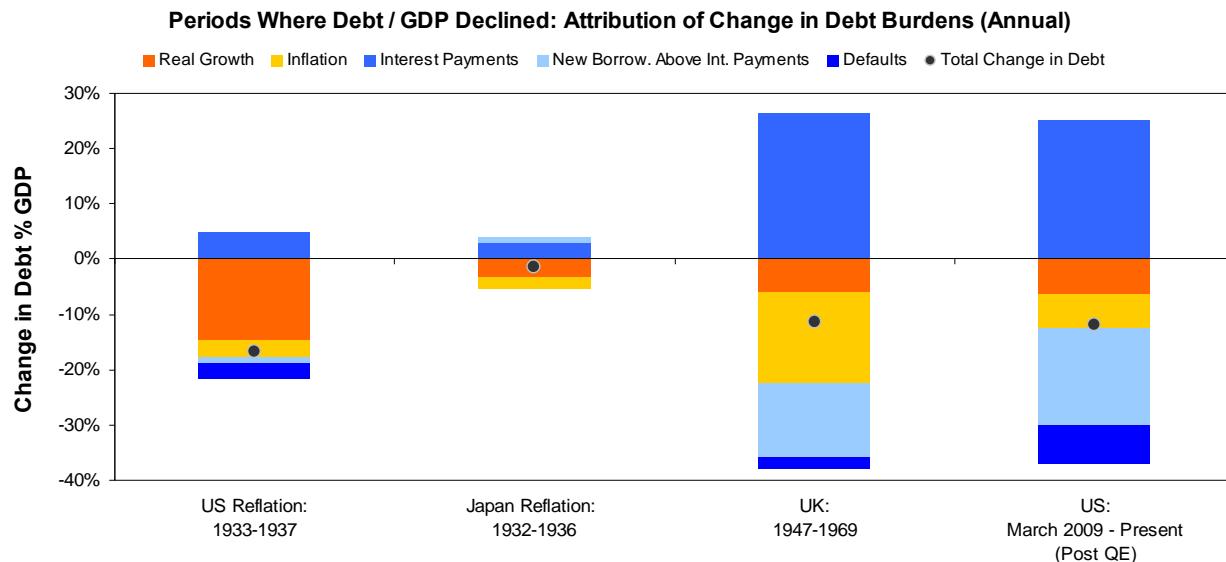
As shown below, in all of these cases, money printing and currency devaluations were sizable, nominal growth rates were pushed above nominal interest rates and the debt/income ratios fell. During the reflation periods, a recovery in nominal incomes lessened the debt/income burdens. Naturally, in cases in which the downturns that preceded these periods were very deep (e.g., 1930–32 in the US) the rebounds were greater.

| Monetary Policy in Deleveragings                        | US Reflation: | Japan Reflation: | UK:       | March 2009 -Present |
|---|---------------|------------------|-----------|---------------------|
|   | 1933-1937     | 1932-1936        | 1947-1969 | (Post QE)           |
| Nominal GDP Growth - Gov't Bond Yield                   | 6.3%          | 2.3%             | 1.6%      | 0.3%                |
| Nominal GDP Growth                                      | 9.2%          | 7.0%             | 6.8%      | 3.5%                |
| GDP Deflator  | 2.0%          | 1.4%             | 3.9%      | 1.4%                |
| Real  | 7.2%          | 5.6%             | 2.9%      | 2.0%                |
| Gov't Bond Yield, Avg.                                  | 2.9%          | 4.7%             | 5.2%      | 3.2%                |
| M0 Growth % GDP, Avg. Ann.                              | 1.7%          | 0.7%             | 0.3%      | 3.3%                |
| Central Bank Asset Purchases & Lending, 10yr Dur., Ann. | 0.3%          | ---              | 0.0%      | 3.1%                |
| FX v. Price of Gold (+ means rally v. gold), Ann        | -10.0%        | -19.3%           | -1.4%     | -18.9%              |
| FX v. USD (TWI for USA), Ann                            | -1.6%         | -10.5%           | -2.3%     | -4.8%               |
| Total Debt level as % GDP: Starting Point               | 252%          | 107%             | 395%      | 368%                |
| Total Debt level as % GDP: Ending Point                 | 168%          | 99%              | 146%      | 334%                |
| Change in Total Debt (% GDP)                            | -84%          | -8%              | -249%     | -34%                |
| Change in Total Debt (% GDP), Ann.                      | -17%          | -2%              | -11%      | -13%                |

\*For ESP, ECB lending to ESP and ECB purchases of ESP assets is shown.

Sources: Global Financial Data & BW Estimates

The chart that follows shows the rates and compositions of the reductions in the debt/income ratios. The dots show the change in the debt/income ratios and the bars show the attribution of the sources of these reductions.



Notes:

- In the US nominal growth has outpaced nominal government bond yields, but has been a bit below aggregate interest rates paid in the economy (given the credit spread component of private sector debt and that the fall in bond yields today flows through with a lag to the rate borne in the economy). As a result, the increase in debt/GDP from interest payments has been a bit higher than the reduction from nominal incomes (real + inflation), but the trajectory is for aggregate economy-wide interest rates to fall below nominal growth.

- For the Japan in the 1930s case, we do not have reliable default data, so "New Borrowing above Int. Payments" is net of defaults in that case.

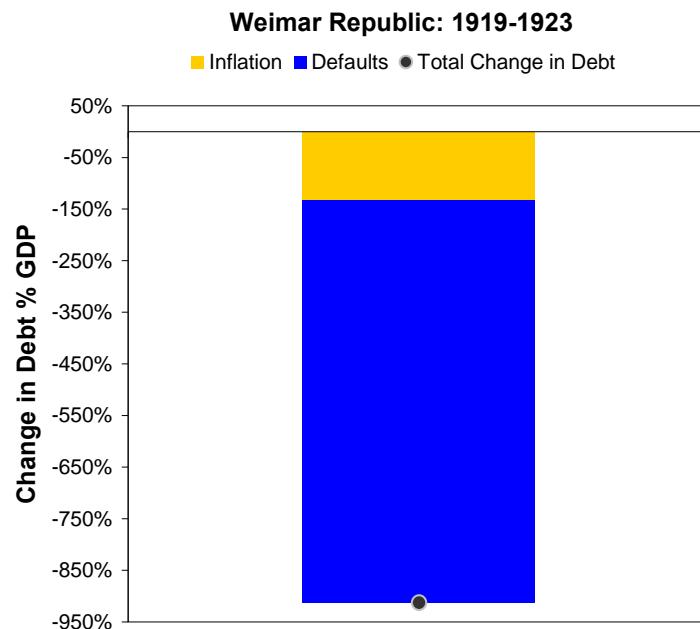
## The Ugly Inflationary Deleveraging (i.e., when the economy was bad at the same time as there was hyperinflation that wiped out the debts)

While you can get the rough big picture of the dynamic from the numbers below, which summarize the hyperinflation of the Weimar Republic, the explanation that will follow later will make this picture clearer. This dynamic is basically the same as those in other inflationary deleveragings such as those in Latin America in the 1980s.

| Weimar Republic: 1919-1923            |                |
|---------------------------------------|----------------|
| Monetary Policy                       |                |
| Chg in FX v. Gold Over Period         | -100%          |
| Total % Chg in M0 Over Period         | 1.2 Trillion % |
| Attribution of Change in Debt %GDP    |                |
| Starting Total Govt Obligations %GDP  | 913%           |
| Of Which:                             |                |
| WWI Reparations                       | 780%           |
| Other Govt Debt                       | 133%           |
| Change in Total Govt Obligations %GDP | -913%          |
| Of Which:                             |                |
| WWI Reparations (Defaulted On)*       | -780%          |
| Other Govt Debt (Inflated away)       | -133%          |

\* The reparations were reduced from 269 billion gold marks at the start of 1921 to 132 that spring. After the Reich stopped paying reparations in the summer of 1922, the debts were restructured multiple times – to 112 in 1929, and then basically wiped out in 1932.

The attribution of the hyperinflation and default in reducing the debt is shown below:

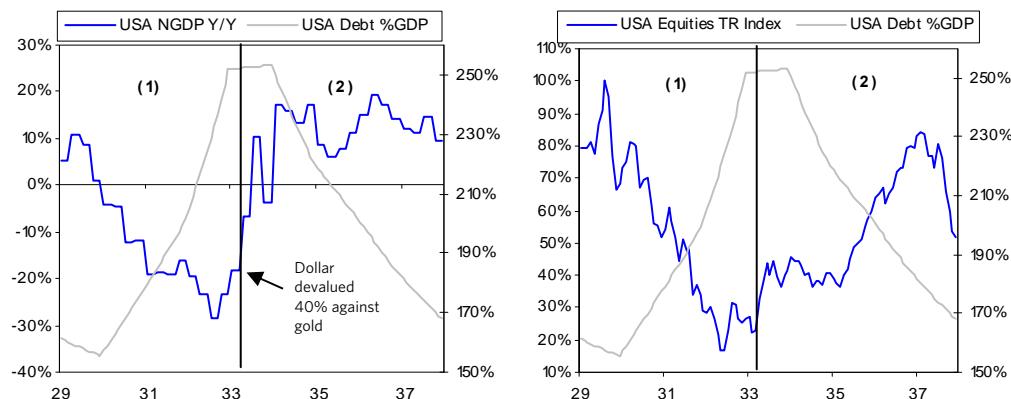


## A Closer Look at Each

### United States Depression and Reflation, 1930-1937

As explained, the US Great Deleveraging in the 1930s transpired in two phases - a deflationary depression from 1930 through 1932, and a reflationary deleveraging from 1933 to 1937. The charts below show debt levels against nominal GDP growth year over year (left chart) and against the total return of stocks (right chart). Debt levels as % of GDP are on the right axis of each chart. The line shows where there was a significant amount of "money printing". The first phase is labeled (1) and the second phase is labeled (2). During the first phase (the "ugly deflationary depression" phase), income and credit collapsed, with nominal growth rates falling significantly below nominal interest rates, and the economy contracted while the debt/income ratio rose. As shown, it followed the stock market bubble bursting in September 1929. As a result of that private sector deleveraging, incomes collapsed, to the point that they were declining by nearly 30% per year at the end of 1932. Because of the fall in incomes, debt/GDP rose from roughly 150% to 250% of GDP (as shown on the left).

Through this time stocks fell by more than 80% (as shown on the right). This first phase ended and the second phase began when the money printing started in March 1933. FDR broke the peg to gold and the dollar fell 40% from 21 dollars/ounce to 35 over the course of the year. This reflation also led to rising economic activity, and nominal growth to be above nominal interest rates. 1937 is when it ended in response to the Fed turning restrictive which caused a "re"cession (which is when the term was invented).



Sources: Global Financial Data & BW Estimates

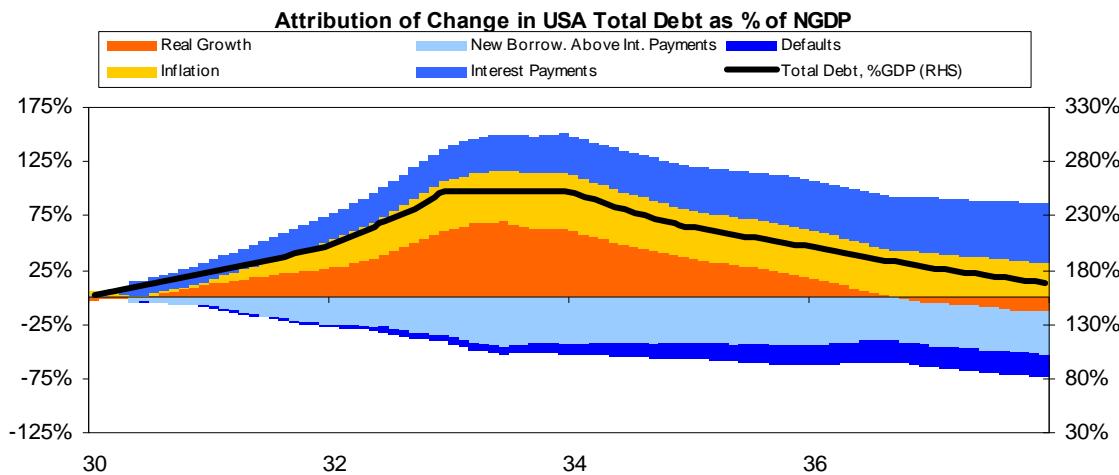
In March of '33, the Fed eased by devaluing the dollar against gold and kept interest rates low for many years. Most of the additional balance sheet expansion was to buy gold to keep the value of the dollar depressed. While the Fed made money easy through low rates and currency, it did not directly buy many risky assets (unlike today as I discuss further below).

The table below tells this story more precisely. During the “ugly deflationary depression”, incomes collapsed as nominal GDP fell 17% per year, about half from deflation and half from the collapse in real demand. As a result, nominal growth was 20.4% below nominal rates, and debt to GDP rose at a rate of 32% per year. Beginning March 1933, the government devalued the dollar against gold and from '33-'37 it increased money supply roughly 1.7% of GDP. Nominal growth recovered at a rate of 9.2% in this period, a combination of 7.2% real growth and moderate 2% inflation. Nominal GDP rose to 6.3% above rates. The private sector reduced its debt burdens, while government borrowing grew with incomes.

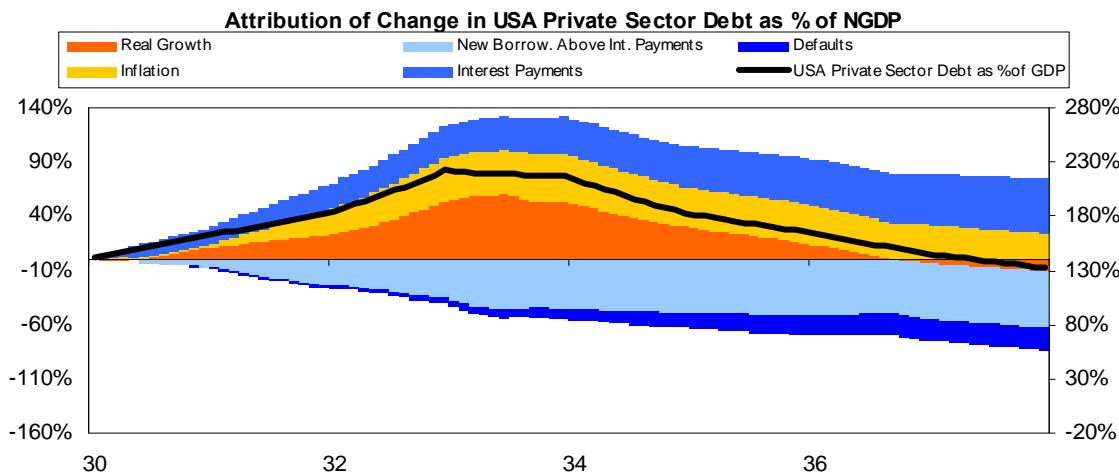
|   | US Depression:<br>1930-1932 | US Reflation:<br>1933-1937 |
|---|-----------------------------|----------------------------|
| <b>Overall Economy</b>                                  |                             |                            |
| Nominal GDP Growth, Avg. Y/Y                            | -17.0%                      | 9.2%                       |
| Of Which:   |                             |                            |
| GDP Deflator  | -8.0%                       | 2.0%                       |
| Real  | -9.0%                       | 7.2%                       |
| Productivity Growth                                     | -2.7%                       | 3.9%                       |
| Employment Growth                                       | -6.3%                       | 3.3%                       |
| Of Which:   |                             |                            |
| Domestic  | -15.2%                      | 8.6%                       |
| Foreign   | -1.7%                       | 0.6%                       |
| <b>Monetary Policy</b>                                  |                             |                            |
| Nominal GDP Growth - Gov't Bond Yield                   | -20.4%                      | 6.3%                       |
| Nominal GDP Growth                                      | -17.0%                      | 9.2%                       |
| Gov't Bond Yield, Avg.                                  | 3.4%                        | 2.9%                       |
| M0 Growth % GDP, Avg. Ann.                              | 0.4%                        | 1.7%                       |
| Central Bank Asset Purchases & Lending, 10yr Dur., Ann. | 0.4%                        | 0.3%                       |
| FX v. Price of Gold (+ means rally v. gold), Ann.       | 0.0%                        | -10.0%                     |
| FX v. USD (TWI for USA), Ann.                           | 2.9%                        | -1.6%                      |
| <b>Attribution of Change in Nominal Debt %NGDP</b>      |                             |                            |
| Total Debt level as % GDP: Starting Point               | 155%                        | 252%                       |
| Total Debt level as % GDP: Ending Point                 | 252%                        | 168%                       |
| Change in Total Debt (% GDP)                            | 96%                         | -84%                       |
| Change in Total Debt (% GDP), Ann.                      | 32%                         | -17%                       |
| Of Which:   |                             |                            |
| Nominal GDP Growth                                      | 36%                         | -18%                       |
| Real Growth   | 20%                         | -15%                       |
| Inflation   | 15%                         | -3%                        |
| Change in Nominal Debt                                  | -3%                         | 1%                         |
| Net New Borrowing                                       | -2%                         | 4%                         |
| New Borrow. Above Int. Payments                         | -12%                        | -1%                        |
| Interest Payments                                       | 10%                         | 5%                         |
| Defaults  | -2%                         | -3%                        |
| Of Which:   |                             |                            |
| Government Sector                                       | 5%                          | 1%                         |
| Private Sector  | 27%                         | -18%                       |

Sources: Global Financial Data & BW Estimates

The chart below shows an over time picture of the same basic attribution shown earlier. Relative to GDP, total debt was the same in 1937 as in 1930. In between, it ballooned because of a contraction in incomes from deflation and negative real growth. The reversal of the debt burden was driven by a rise in incomes to 1930 levels in nominal terms. Borrowing for interest payments was mostly offset by paying down of debts.

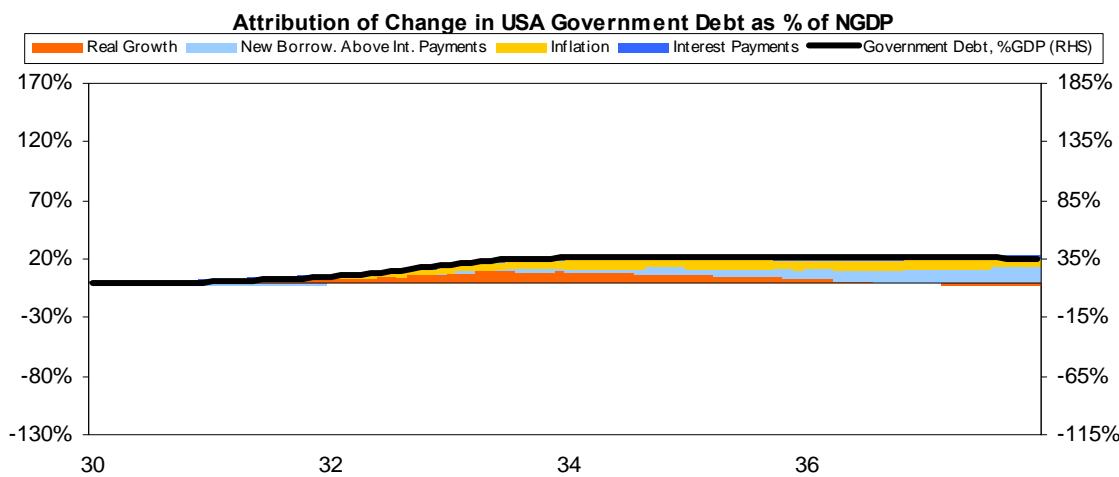


This reversal in incomes was also the primary driver of changes in debt burdens for the private sector, along with debt pay-downs. Defaults were a small driver.

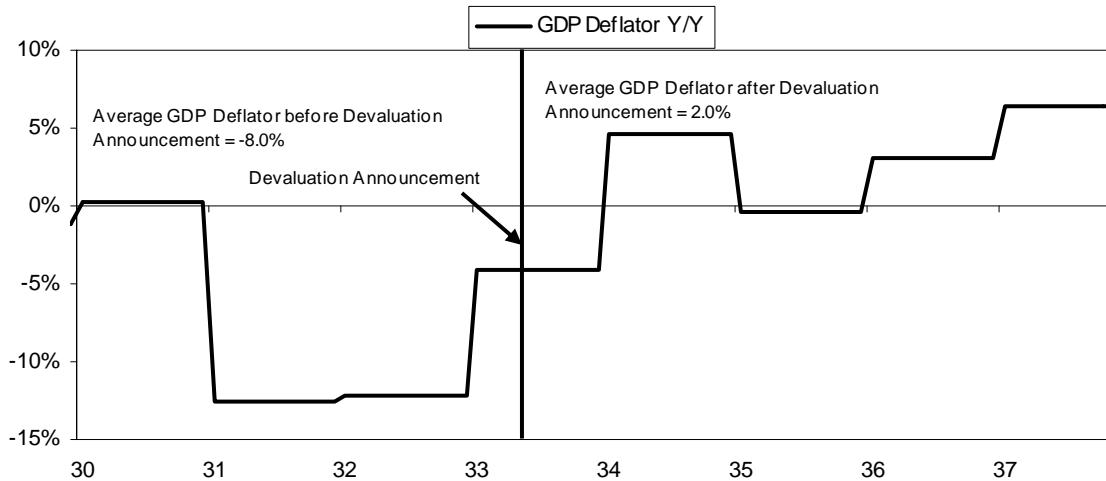


Sources: Global Financial Data & BW Estimates for charts above

The stock of government debt was small at the onset of the depression. Initially, this debt burden rose because of the collapse in income. Nominal government debt levels increased following 1933 because of larger fiscal deficits, while the income recovery cushioned the increase in these burdens.

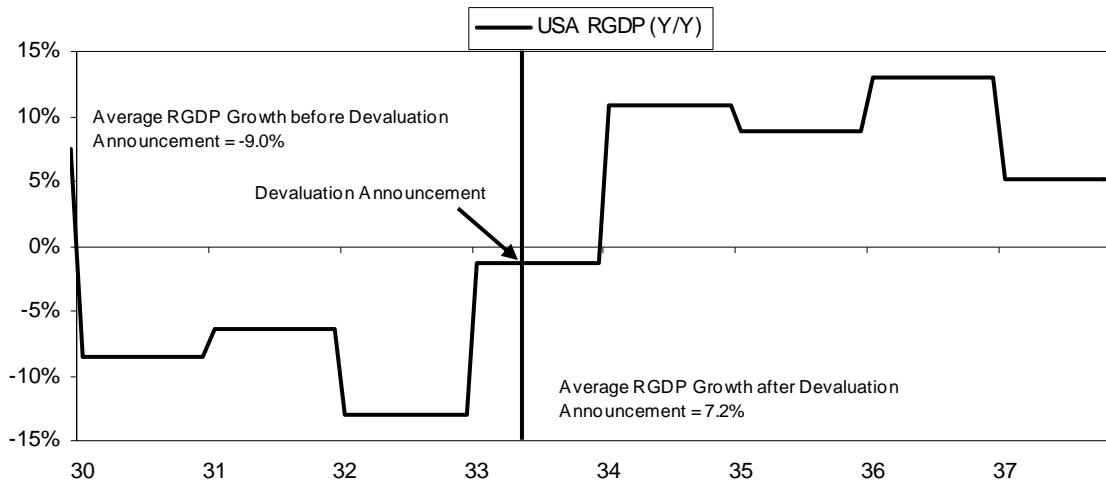


As shown below, the catalyst for the recovery was the printing and dollar devaluation against gold. Price levels turned at this point, from declining at an average rate of 8% to increasing roughly 2% per year. This is a good example of how printing negated deflation rather than triggering high inflation.

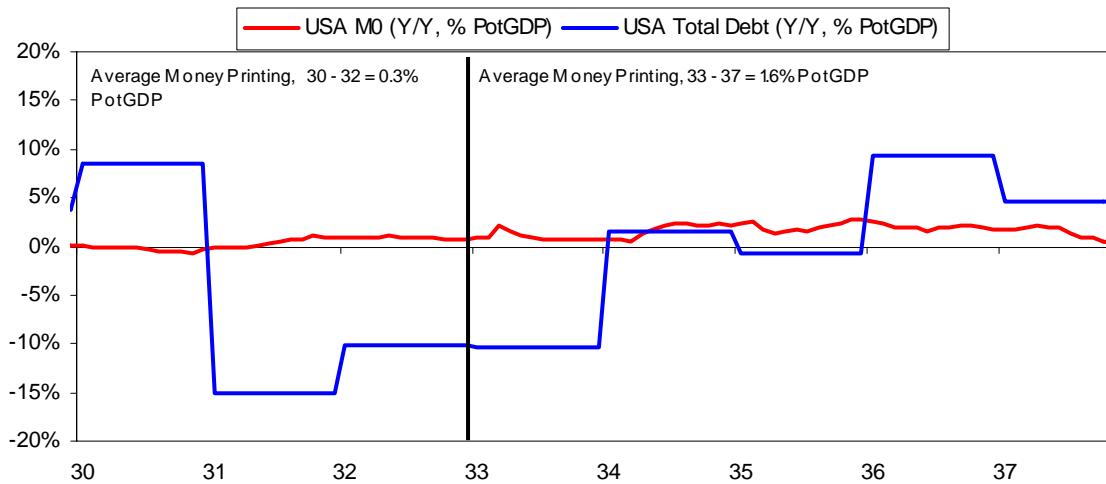


Sources: Global Financial Data & BW Estimates for charts above

As shown below, real economic activity also rebounded after the announcement.

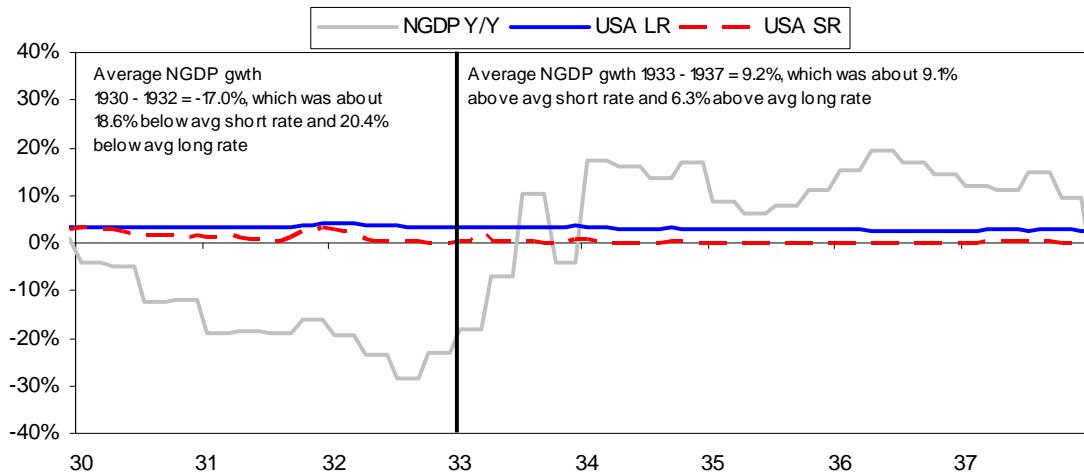


Credit stopped declining at this point and stabilized at low levels of creation, while money printing increased moderately.

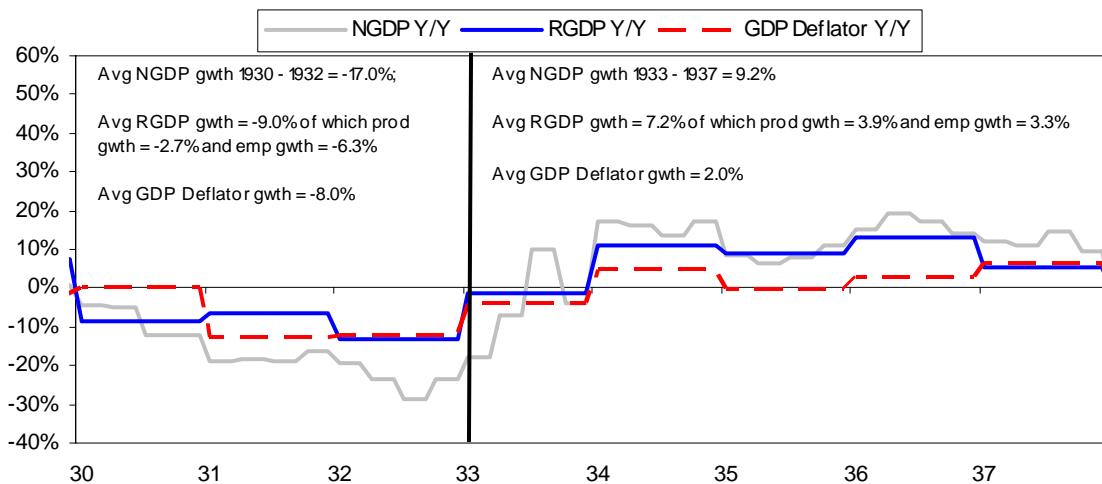


Sources: Global Financial Data & BW Estimates for charts above

With the different policy steps taken from 1933 through 1937, nominal GDP growth moved substantially above government rates, greatly reducing debt burdens.



This nominal GDP growth consisted of strong real growth (from a depressed level) and moderate inflation.

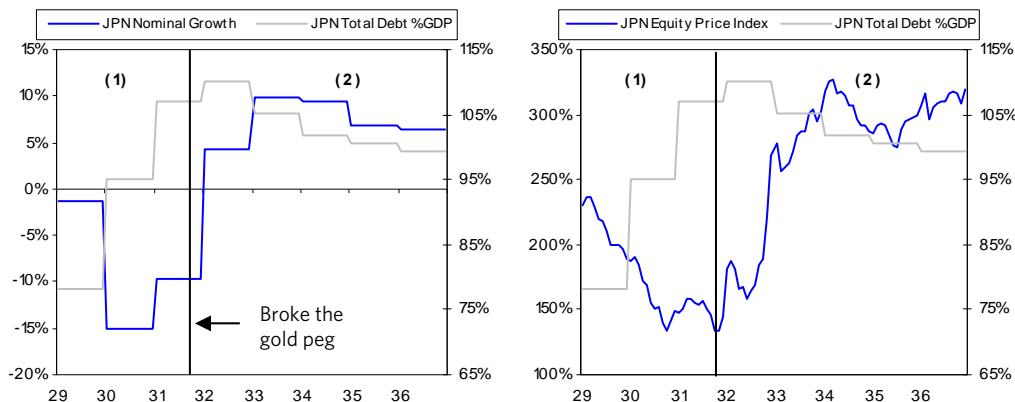


Sources: Global Financial Data & BW Estimates for charts above

## Japan Depression and Reflation, 1929-1936

The Japanese deleveraging during the Great Depression was similar to the experience of the US, though Japan printed money earlier than the US did. The ugly deflationary phase, labeled (1), began three months after the Wall Street Crash of 1929 when Japan returned to the gold standard at a high pre-WWI level. That arose because the political party gaining power believed the debt excesses of the past required fiscal and monetary restraint to fix the debt problems. The expensive currency and the deteriorating global economy caused a collapse in real growth, severe deflation, a decline in exports, a crash in stock prices, and a tightening of liquidity as Japan's gold reserves fell. Collapsing incomes resulted in debt increasing from nearly 75% of GDP in 1929 to nearly 110% of GDP by the end of 1931. Then, in response to this pain, a new government came into power in late 1931 and broke the link to gold as one of its first moves. Over the course of a year, the yen devalued about 60% against the dollar and gold. At the same time, the government increased expenditures by about 3% of GDP, and the Bank of Japan kept rates low and monetized a modest amount of government debt. This stimulus supported a recovery in exports, price levels and incomes over the period from 1932-1936, labeled (2) in the charts below.

The charts below show debt levels against nominal GDP growth year over year (left chart) and against the total return of stocks (right chart). Debt levels as % of GDP are on the right axis of each chart. The line shows where the government delinked the currency from gold. The devaluation and low short rates brought nominal growth above nominal interest, which led the total debt to fall by 10% of GDP.



The table below shows the attribution of the changes in some detail. As shown, during the ugly deflationary depression phase from 1929-1931, incomes collapsed as nominal GDP fell 9% per year, mostly from deflation, though real growth fell as well. As a result, nominal growth was 14% below nominal rates, and debt to GDP rose at a rate of 11% per year. After the devaluation, nominal growth recovered at a rate of 7% in this period, a combination of 6% real growth and moderate 1-2% inflation eroding domestic debt burdens. Nearly half of the recovery in nominal GDP came from a rebound in exports that was supported by the more competitive yen and global recovery. This level of growth, combined with low interest rates, kept nominal GDP growing 2% above nominal rates. Accordingly, the private sector reduced its debt burdens, though the government kept borrowing through the period.

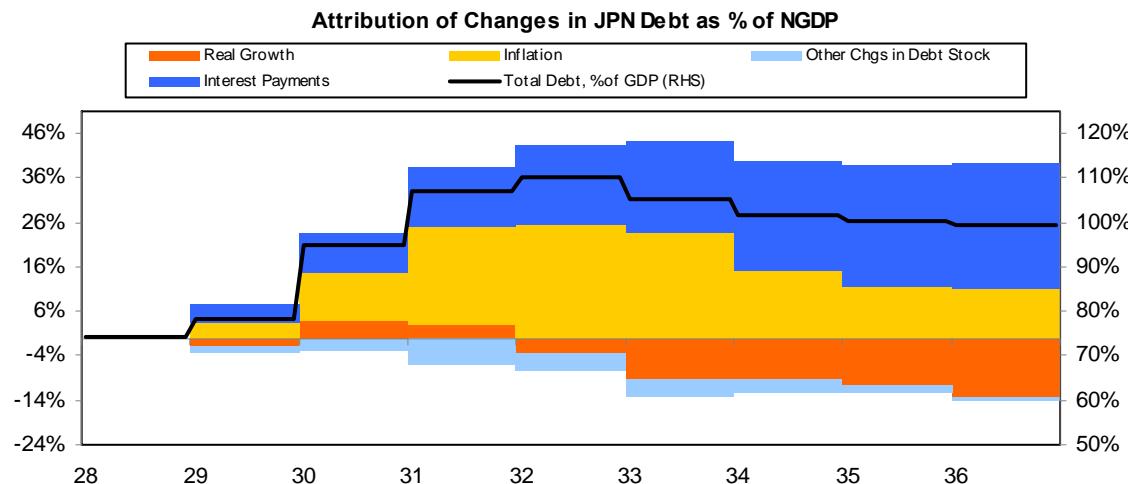
| Japan<br>1929 to 1931 1932 to 1936               |        |        |
|--|--------|--------|
| Overall Economy                                  |        |        |
| Nominal GDP Growth, Avg. Y/Y                     | -8.6%  | 7.0%   |
| Of Which:  |        |        |
| GDP Deflator                                     | -7.4%  | 1.4%   |
| Real   | -1.2%  | 5.6%   |
| Of Which:  |        |        |
| Domestic   | -6.6%  | 3.9%   |
| Foreign  | -2.0%  | 3.2%   |
| Monetary Policy                                  |        |        |
| Nominal GDP Growth - Gov't Bond Yield            | -13.7% | 2.3%   |
| Nominal GDP Growth                               | -8.6%  | 7.0%   |
| GDP Deflator                                     | -7.4%  | 1.4%   |
| Real   | -1.2%  | 5.6%   |
| Gov't Bond Yield, Avg.                           | 5.1%   | 4.7%   |
| M0 Growth % GDP, Avg. Ann.                       | -1.0%  | 0.7%   |
| FX v. Price of Gold (+ means rally v. gold), Ann | 2.7%   | -19.3% |
| FX v. USD (TWI for USA), Ann                     | 2.7%   | -10.5% |

- Nominal growth recovered from -9% to 7%
- Severe deflation moved to moderate inflation
- Real growth moved from contracting to strongly growing
- Nearly half of the recovery came from foreign demand
- Strong rebound in nominal growth and slight decline in bond yields leads to conditions for "beautiful deleveraging"
- Money printing of about 0.7% per year

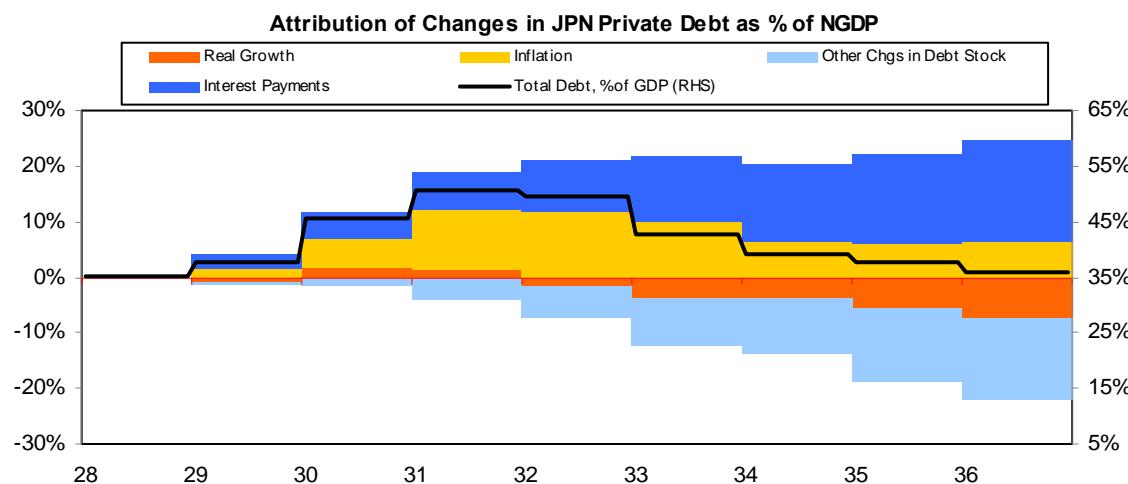
| Japan<br>1929 to 1931 1931 to 1936          |       |       |
|---|-------|-------|
| Attribution of Change in Nominal Debt %NGDP |       |       |
| Total Debt Level as % GDP: Starting Point   | 74%   | 107%  |
| Total Debt Level as % GDP: Ending Point     | 107%  | 99%   |
| Change in Total Debt as % GDP               | 33%   | -8%   |
| Change in Total Debt as % GDP, Ann.         | 11.2% | -1.5% |
| Of Which:                                   |       |       |
| Nominal GDP Growth                          | 8.6%  | -5.4% |
| Real Growth                                 | 1.0%  | -3.2% |
| Inflation                                   | 7.6%  | -2.2% |
| Change in Nominal Debt                      | 2.6%  | 3.9%  |
| Interest Payments                           | 4.6%  | 2.9%  |
| Other Chgs                                  | -2.0% | 1.0%  |
| Of Which:                                   |       |       |
| Government Sector                           | 5.9%  | 1.4%  |
| Private Sector                              | 5.3%  | -2.9% |

- Nominal growth contributed to 5% decline in debt / GDP during reflation
- Government continued to borrow
- Private sector deleveraging

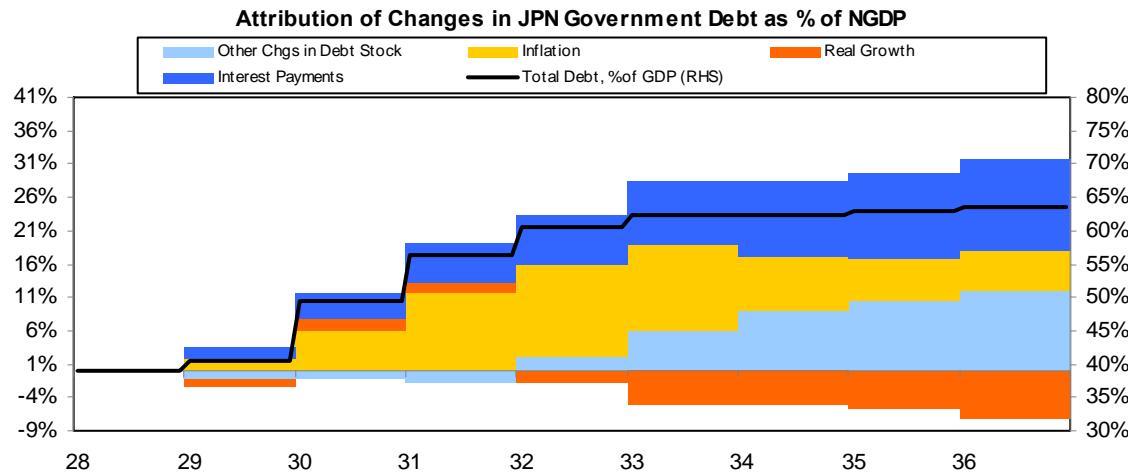
As shown below, the biggest driver of the increase in debt relative to GDP in the ugly deleveraging phase was deflation. At the same time, a real growth contraction further pushed incomes downward and borrowing to pay for interest payments pushed debts higher. After the gold peg was broken in late 1931, debt to GDP gradually fell, as rising income from real growth and inflation offset increasing debt stocks.



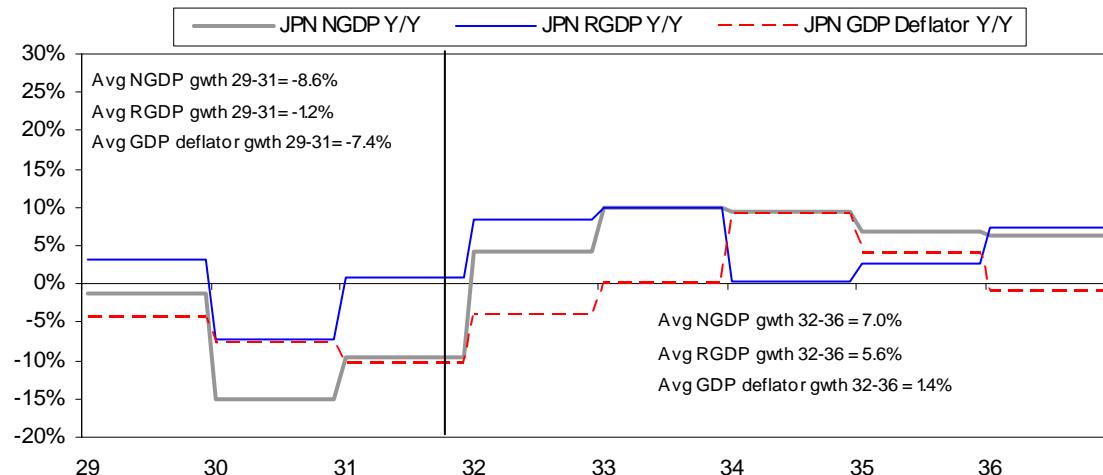
The private sector saw nearly all of their increase in debt/GDP from the ugly deleveraging stage reversed as inflation and real growth boosted incomes and offset interest burdens. Note that we do not have good information on whether defaults played a material role in the deleveraging.



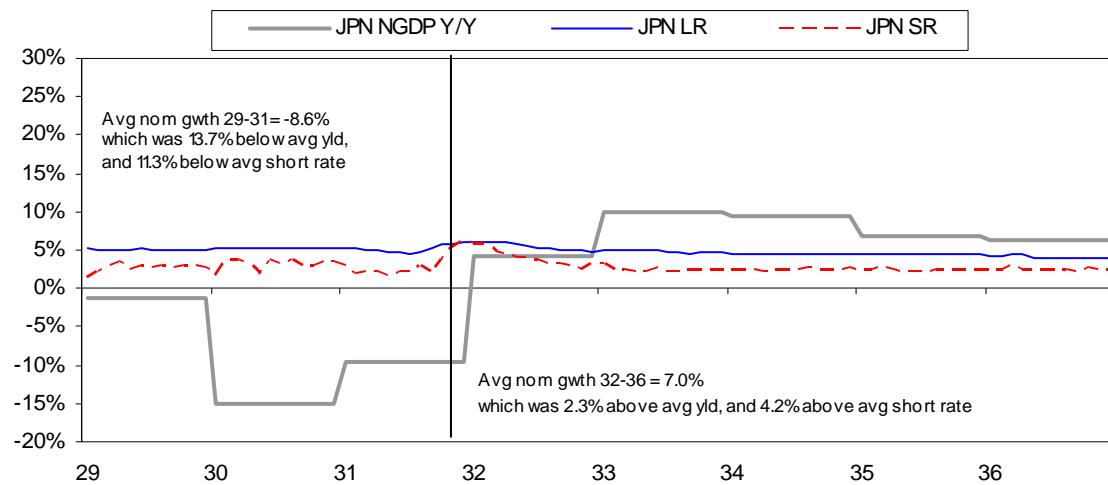
During the reflation, the deleveraging in the private sector was partially offset by an expansion in government borrowing that funded extensive military spending programs.



The chart below shows nominal GDP growth during the two phases of the deleveraging. In the ugly deleveraging phase, a deflation rate of 7.4% shrank incomes, even as the contraction in real growth was more modest. Following the devaluation, nominal GDP grew at an average rate of 7.0% per year due to strong real growth and more modest inflation.

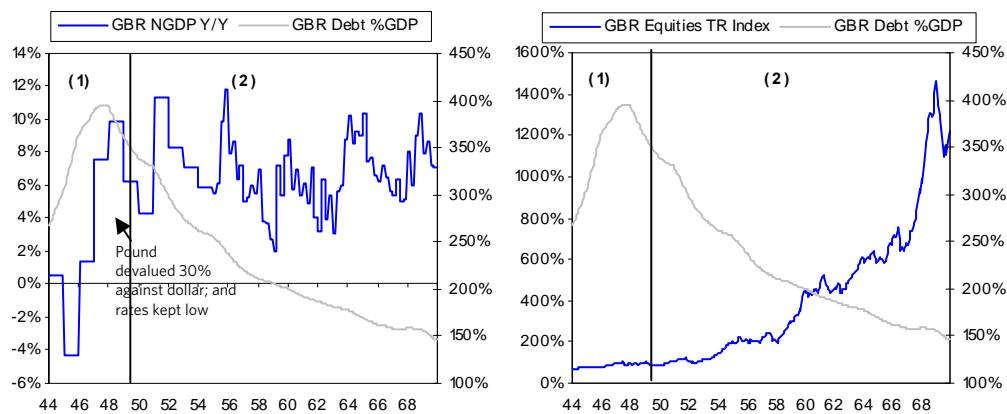


Nominal long rates were on average about 50bps lower following the devaluation. With the rebound in growth following the devaluation bringing nominal rates above nominal interest rates, Japan was able to gradually lower its debt burdens over the subsequent years.



## UK Deleveraging, 1947-1969

The charts below show debt levels against nominal GDP growth year over year (left chart) and against the total return of stocks (right chart). Debt levels as % of GDP are on the right axis of each chart. The line shows where a significant amount of “money printing” occurred. The first phase is labeled (1) and the second phase is labeled (2). The UK acquired lots of debt both before and during World War II and entered a recession at the end of World War II, pushing debt burdens higher. As shown, from the end of 1943 to the end of 1947 debt levels rose from just above 250% of GDP to 400%. While in 1948 debt burdens dipped a bit with a recovery in incomes, in September 1949 the UK printed money and devalued the pound by 30% against the dollar and gold, at the same time also keeping short rates basically at zero. As a result nominal growth rose above nominal interest rates, debt levels fell by 250% and stocks rallied between 1948 and 1969.



Sources: Global Financial Data & BW Estimates

At the same time that the UK kept interest rates low with easy money during the period, there was a big currency devaluation in 1949 and the BOE increased asset purchases to about 1% GDP in 1950, both of which helped to keep nominal growth above nominal interest rates, which was the most important influence in lowering the debt/income ratio.

The table below shows how the most important part of this deleveraging occurred. I broke it up into two parts – from 1947 to 1959 and from 1960 to 1969 because they were a bit different.

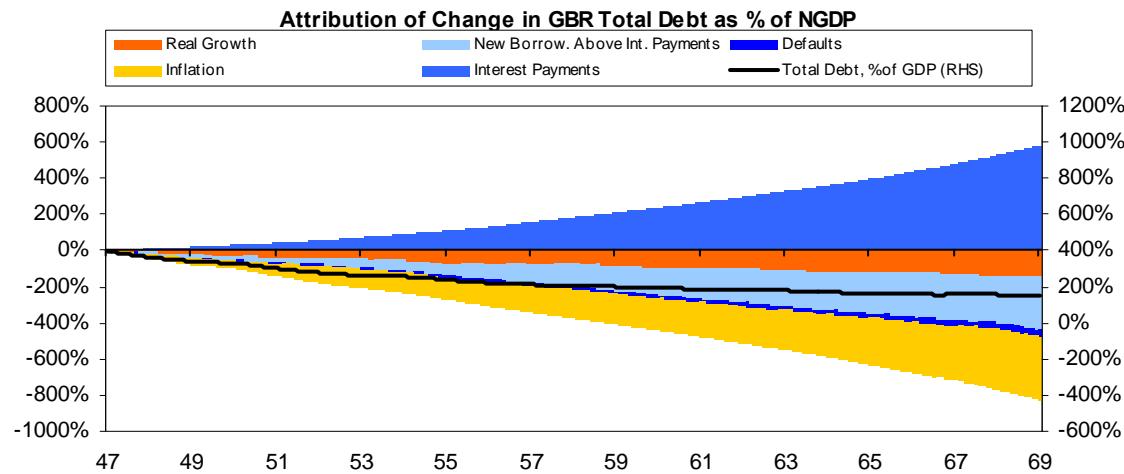
|   | UK:<br>1947-1959 | UK:<br>1960-1969 |
|---|------------------|------------------|
| <b>Overall Economy</b>                                  |                  |                  |
| Nominal GDP Growth, Avg. Y/Y                            | 7.0%             | 6.8%             |
| Of Which:   |                  |                  |
| GDP Deflator  | 4.0%             | 3.6%             |
| Real  | 2.9%             | 3.1%             |
| Productivity Growth                                     | 2.4%             | 2.6%             |
| Employment Growth                                       | 0.5%             | 0.6%             |
| Of Which:   |                  |                  |
| Domestic  | 5.6%             | 5.6%             |
| Foreign   | 1.4%             | 1.2%             |
| <b>Monetary Policy</b>                                  |                  |                  |
| Nominal GDP Growth - Gov't Bond Yield                   | 2.8%             | 0.3%             |
| Nominal GDP Growth                                      | 7.0%             | 6.8%             |
| Gov't Bond Yield, Avg.                                  | 4.2%             | 6.5%             |
| M0 Growth % GDP, Avg. Ann.                              | 0.3%             | 0.4%             |
| Central Bank Asset Purchases & Lending, 10yr Dur., Ann. | 0.0%             | 0.1%             |
| FX v. Price of Gold (+ means rally v. gold), Ann        | -1.4%            | -1.5%            |
| FX v. USD (TWI for USA), Ann                            | -3.0%            | -1.5%            |
| <b>Attribution of Change in Nominal Debt %NGDP</b>      |                  |                  |
| Total Debt level as % GDP: Starting Point               | 395%             | 200%             |
| Total Debt level as % GDP: Ending Point                 | 200%             | 146%             |
| Change in Total Debt (% GDP)                            | -195%            | -54%             |
| Change in Total Debt (% GDP), Ann.                      | -16%             | -5%              |
| Of Which:   |                  |                  |
| Nominal GDP Growth                                      | -21%             | -24%             |
| Real Growth   | -7%              | -5%              |
| Inflation   | -14%             | -19%             |
| Change in Nominal Debt                                  | 5%               | 18%              |
| Net New Borrowing                                       | 6%               | 21%              |
| New Borrow. Above Int. Payments                         | -12%             | -16%             |
| Interest Payments                                       | 18%              | 37%              |
| Defaults  | -1%              | -3%              |
| Of Which:   |                  |                  |
| Government Sector                                       | -9%              | -3%              |
| Private Sector  | -7%              | -2%              |

Sources: Global Financial Data & BW Estimates

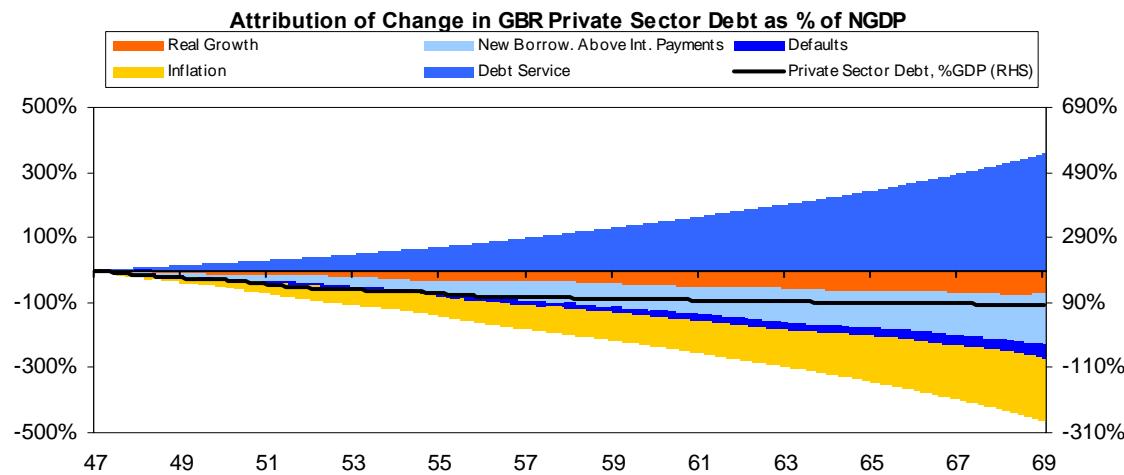
BOE keeps interest rates below nominal growth for more than two decades

UK devalues the pound by 30% against the dollar in Sept. 1949 and pound falls further over the subsequent period

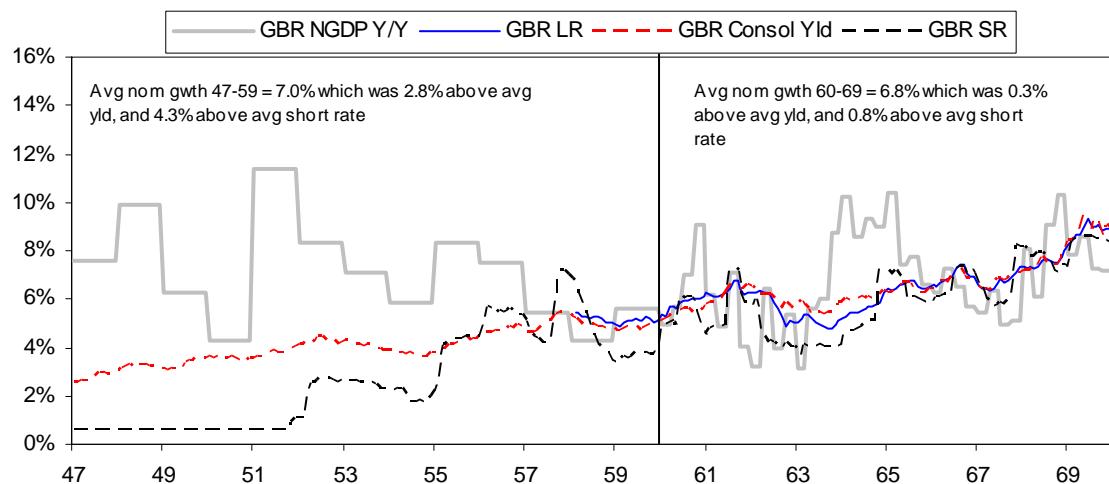
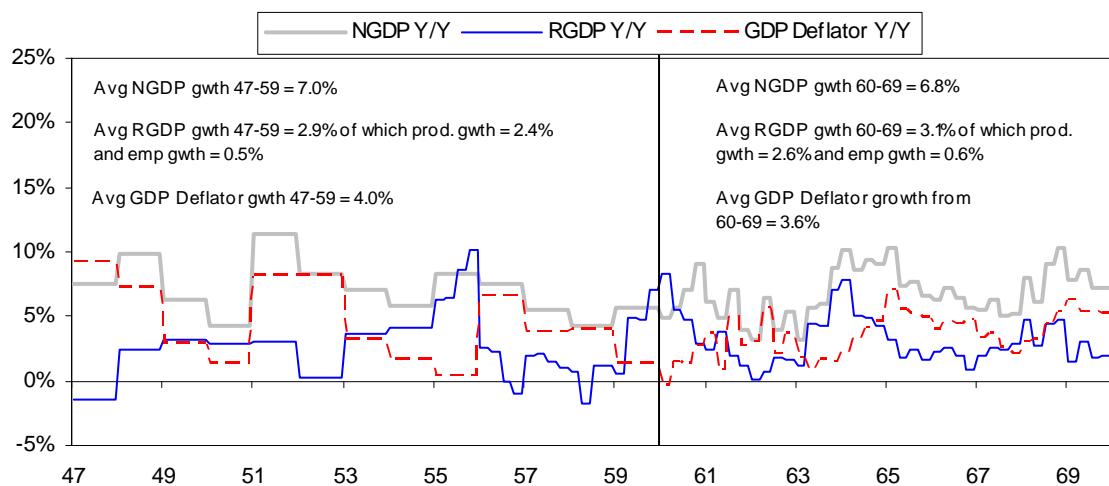
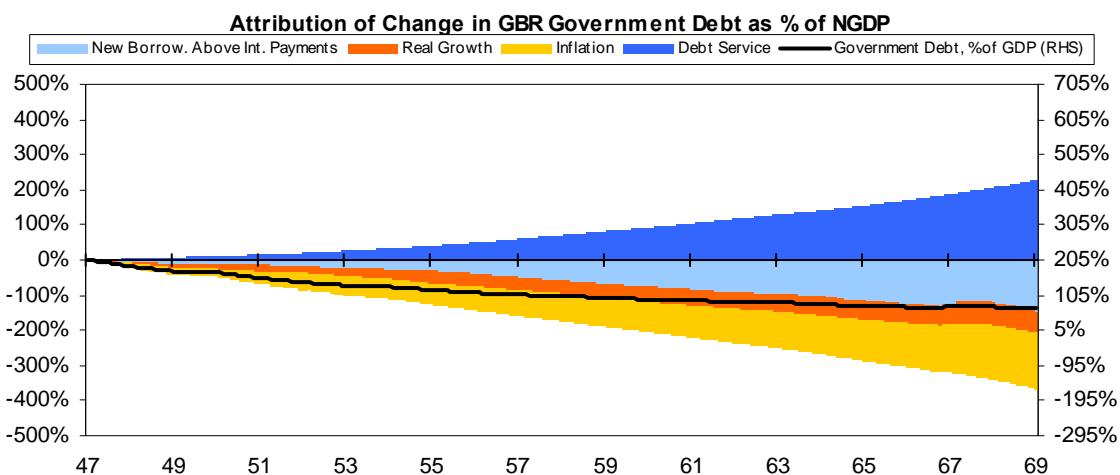
As shown below, as a result of this mix in policies, the decline in total debt in the post-war period occurred via a rise in nominal GDP which outpaced more modest increases in the amount of new borrowing. Inflation of around 4% from 1947-1970 drove nearly 2/3 of the decline in debt to GDP that is attributable to GDP growth. Net new borrowing was small as borrowing for interest payments was offset by paying down debts. This is shown in the chart below.



The same is true for both the government and the private sector. The net new borrowing by the government was relatively small through the period, particularly from 1947-1960. The charts below show the attributions of the changes in the debt ratios.



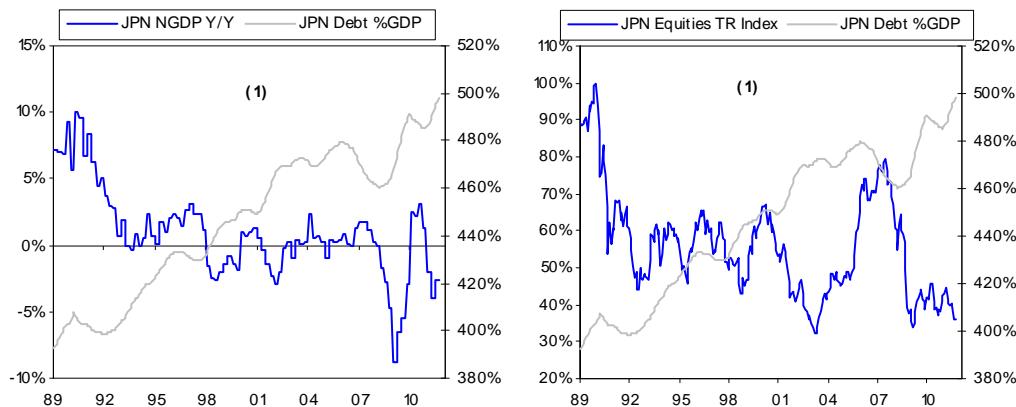
Sources: Global Financial Data & BW Estimates for charts above



Sources: Global Financial Data & BW Estimate for charts above

## Japan Deleveraging, 1990-Present

As shown below, Japan has been stuck in a moderate “ugly deflationary deleveraging” for over 20 years. In 1989 the private sector debt bubble burst and government sector debt/fiscal expansion began, but there was never adequate “money printing/monetization” to cause nominal growth to be above nominal interest rates and to have the currency devalue. While Japan has eased some, nominal income growth has been stagnant, with persistent deflation eroding moderate real growth. Meanwhile, nominal debts have risen much faster, pushing debt levels higher, from about 400% of GDP at the end of 1989 to 500% today. Equities have declined by nearly 70%.

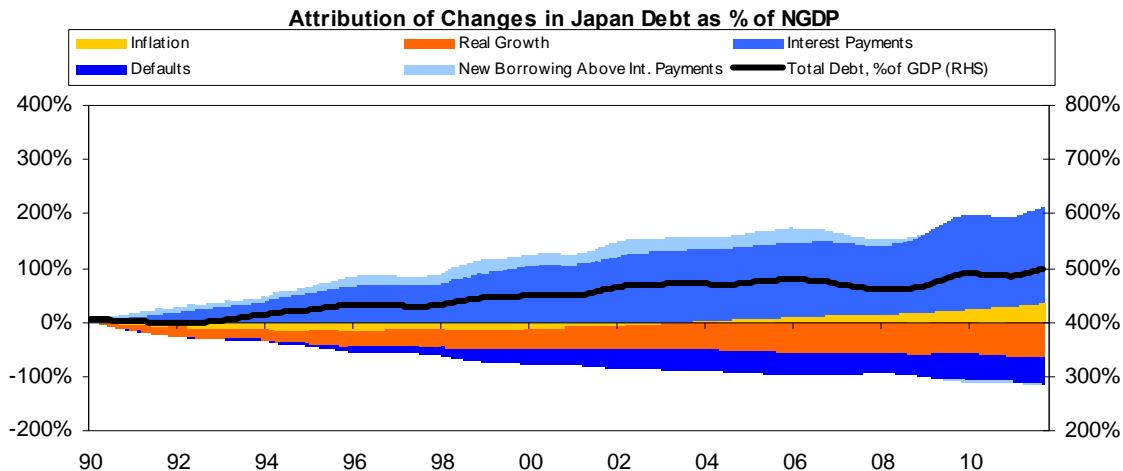


The BOJ has “printed/monetized” very little in duration-adjusted terms throughout the deleveraging process, with most of the printing that it has done going to short-term cash-like assets of little duration. As result, it has failed to reflate and the government is building a terrible debt burden.

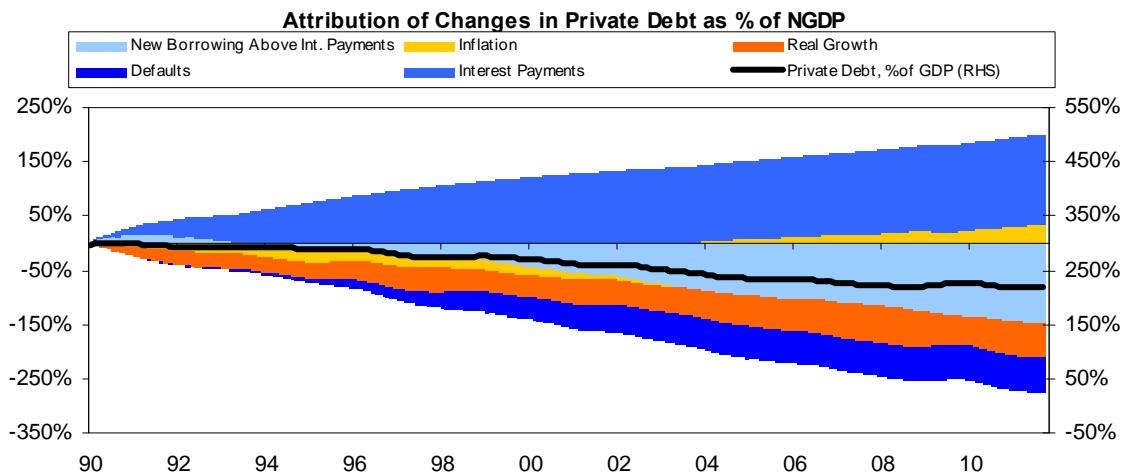
As shown in the table below, money creation has been limited at 0.7% of GDP per year, and the yen has appreciated 2.9% per year against the dollar. As a result, since 1990 real growth has averaged 1.1% with persistent deflation (averaging -0.5%). This has left nominal growth 2% below nominal interest rates which cumulatively has led to a large increase in the debt/income ratio. While the private sector has delevered modestly, Japan's total debt level has climbed from 403% to 498% because of government borrowing and deflation.

| Japan:<br>1990-Present                                  |       |
|---|-------|
| <b>Overall Economy</b>                                  |       |
| Nominal GDP Growth, Avg. Y/Y                            | 0.6%  |
| Of Which:   |       |
| GDP Deflator  | -0.5% |
| Real  | 1.1%  |
| Productivity Growth                                     | 1.0%  |
| Employment Growth                                       | 0.0%  |
| Of Which:   |       |
| Domestic  | 0.2%  |
| Foreign   | 0.4%  |
| <b>Monetary Policy</b>                                  |       |
| Nominal GDP Growth - Gov't Bond Yield                   | -2.0% |
| Nominal GDP Growth                                      | 0.6%  |
| Gov't Bond Yield, Avg.                                  | 2.6%  |
| M0 Growth % GDP, Avg. Ann.                              | 0.7%  |
| Central Bank Asset Purchases & Lending, 10yr Dur., Ann. | 0.1%  |
| FX v. Price of Gold (+ means rally v. gold), Ann        | -3.5% |
| FX v. USD (TWI for USA), Ann                            | 2.9%  |
| <b>Attribution of Change in Nominal Debt %NGDP</b>      |       |
| Total Debt level as % GDP: Starting Point               | 403%  |
| Total Debt level as % GDP: Ending Point                 | 498%  |
| Change in Total Debt (% GDP)                            | 95%   |
| Change in Total Debt (% GDP), Ann.                      | 4%    |
| Of Which:   |       |
| Nominal GDP Growth                                      | -1%   |
| Real Growth   | -3%   |
| Inflation   | 2%    |
| Change in Nominal Debt                                  | 6%    |
| Net New Borrowing                                       | 8%    |
| New Borrow. Above Int. Payments                         | 0%    |
| Interest Payments                                       | 8%    |
| Defaults  | -2%   |
| Of Which:   |       |
| Government Sector                                       | 8%    |
| Private Sector  | -4%   |

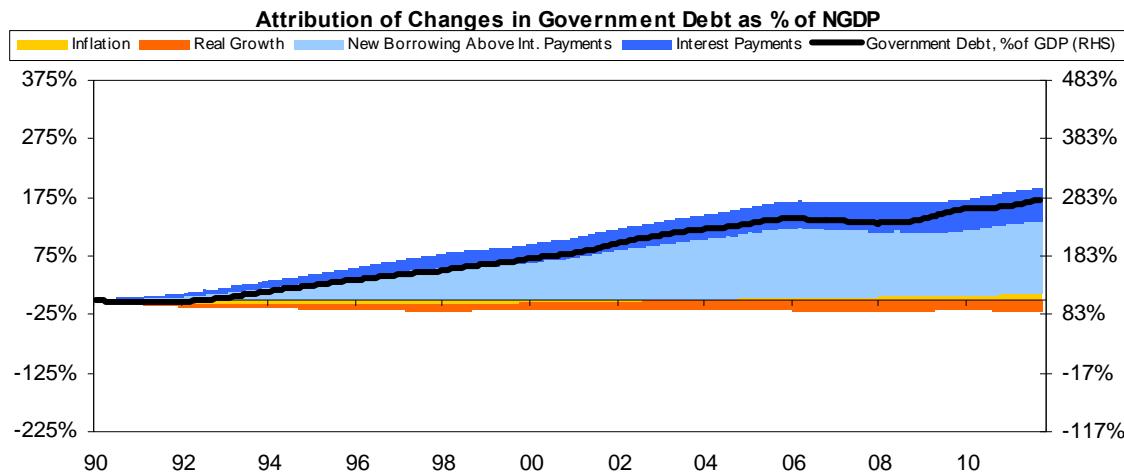
The charts below show how the Japan case developed over time, breaking out the cumulative contributions of different drivers to changes in debt burdens relative to incomes. In aggregate in the economy, new borrowing has merely covered continued debt service and no more. Persistent deflation has added to debt burdens, while defaults and real growth have reduced them.



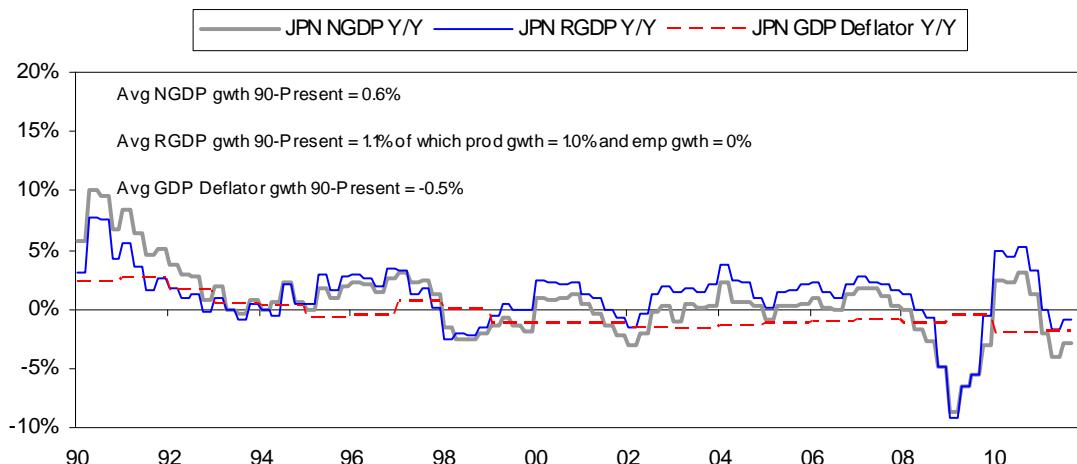
Debt levels for the private sector have fallen modestly. Defaults, real growth and paying down debt after paying interest have helped. Interest payments have been substantial and deflation has also added to debt burdens.



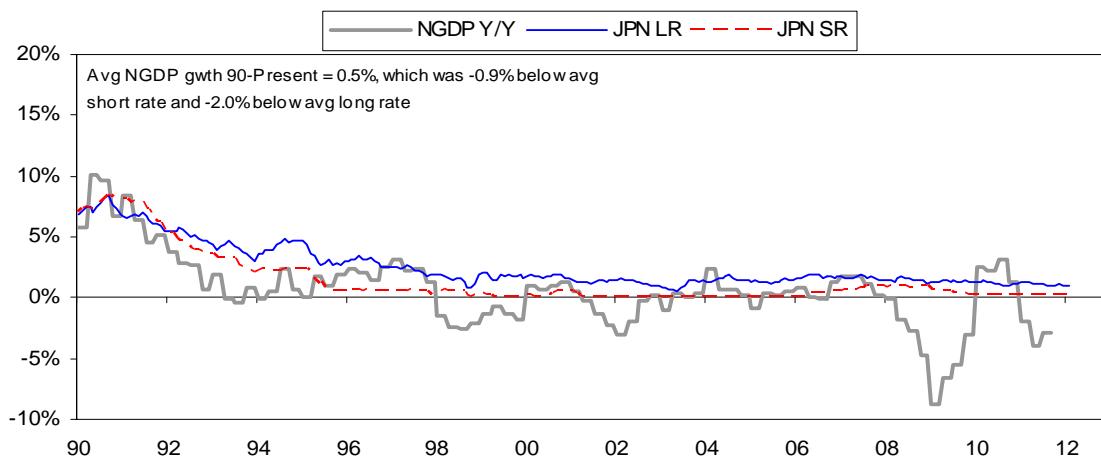
Government borrowing has gone up significantly, mostly to cushion the weak private sector.



Weak nominal GDP growth has resulted from the combination of mediocre real GDP growth and deflation.



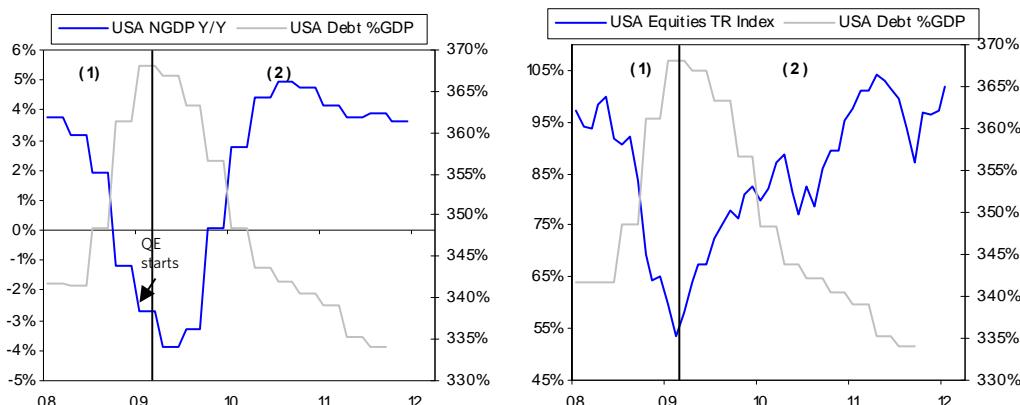
And nominal GDP growth rates have remained below Japanese government rates for most of this period, creating a persistent upwards pressure on debt burdens.



## US Deleveraging, 2008-Present

Like the US deleveraging in the 1930s, the lead-up consisted of a debt driven boom, and the deleveraging has transpired in two stages: a contraction in incomes followed by reflation and growth. However, because of a swift policy response from the Fed, which was prompt in guaranteeing debt and aggressively printing money, the contractionary period only lasted six months (versus over three years in the 1930s), and since then there has been reflation and debt reduction through a mix of rising nominal incomes, default and debt repayment.

As shown in the charts below, unlike both the US in the 1930s and Japan since 1990, the US has quickly entered a reflation and ended the “ugly deflationary deleveraging” phase of the process (which lasted from July 2008, just before Lehman fell, to March 2009, when the Fed instituted its aggressive program of quantitative easing to monetize the debts). During the “ugly” phase, incomes fell, debt burdens rose from about 340% GDP to 370% and stocks lost almost half their value. Because so much debt around the world is dollar denominated, the contraction in global credit and dollar liquidity created a squeeze for dollars, and the dollar strengthened significantly against a trade-weighted basket. Exports collapsed faster than domestic demand. Following the reflation that began in March 2009, incomes recovered, debt burdens fell below their initial starting level to around 335% and stocks recovered all of their losses. At this time, the credit markets are largely healed and private sector credit growth is improving. Thus far, this deleveraging would win my award of the most beautiful deleveraging on record. The key going forward will be for policy makers to maintain balance so that the debt/income ratio keeps declining in an orderly way.



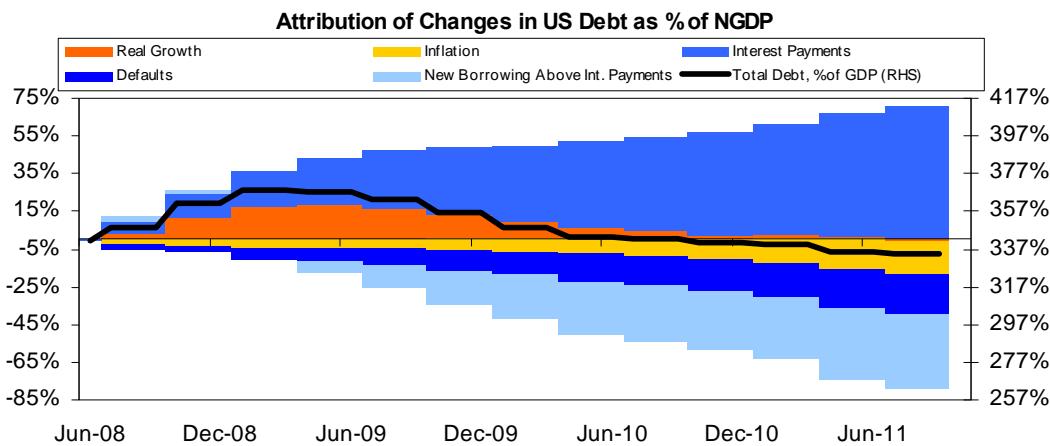
The magnitude of the easing by the Fed has been substantial. Not only did the Fed cut rates and backstop essential credit during the liquidity crisis, but it pursued one of the most aggressive easing policies by pushing money into risky assets. The Fed began to push money into the system with the announcement of a significant QE1 in March 2009 with the purchase of Treasuries and agency-backed bonds. The Fed further increased its holdings of longer duration government debt (mostly Treasuries) with QE2 starting in August 2010 and Operation Twist starting in the fall 2011. During these three periods, changes in asset holdings on a duration-adjusted basis (equivalent to 10-year duration) peaked at 8%, 5% and roughly 2% of GDP annualized pace respectively.

As shown below, during the contractionary period, nominal growth fell at an annualized rate of -5.4% due to a collapse in real activity between July 2008 and February 2009. Falling incomes sent the debt to GDP level higher, even as credit creation collapsed.

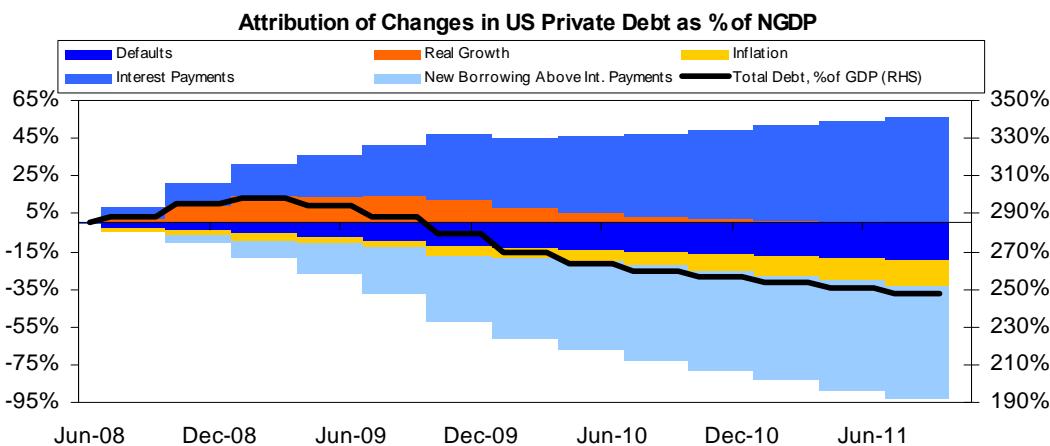
In March 2009, the Fed eased aggressively through QE, as discussed, buying government bonds and pushing a massive amount of money into the system (more than \$1.5 trillion). This push of money and the subsequent reflation of assets stimulated a recovery in economic activity, which rebounded at a rate of 3.5% per year. Nominal growth has been marginally higher than nominal government rates. Debt levels have fallen 13% of GDP per year, because the private sector has deleveraged while government borrowing has risen. Nominal growth contributed to an annualized 12% decline in the debt/income ratio, defaults contributed to a 6% reduction and repayments contributed to a 15% reduction while interest payments contributed to a 20% increase in the debt/income ratio.

|   | US:<br>July 2008-Feb 2009<br>(Pre-QE) | US:<br>March 2009 -Present<br>(Post QE) |
|---|---------------------------------------|---|
| <b>Overall Economy</b>                                  |                                       |   |
| Nominal GDP Growth, Avg. Y/Y                            | -5.4%                                 | 3.5%                                    |
| Of Which:   |                                       |   |
| GDP Deflator  | 2.0%                                  | 1.4%                                    |
| Real  | -7.2%                                 | 2.0%                                    |
| Productivity Growth                                     | -2.4%                                 | 2.3%                                    |
| Employment Growth                                       | -4.8%                                 | -0.3%                                   |
| Of Which:   |                                       |   |
| Domestic  | -1.3%                                 | 1.8%                                    |
| Foreign   | -4.1%                                 | 1.7%                                    |
| <b>Monetary Policy</b>                                  |                                       |   |
| Nominal GDP Growth - Gov't Bond Yield                   | -8.7%                                 | 0.3%                                    |
| Nominal GDP Growth                                      | -5.4%                                 | 3.5%                                    |
| GDP Deflator  | 2.0%                                  | 1.4%                                    |
| Real  | -7.2%                                 | 2.0%                                    |
| Gov't Bond Yield, Avg.                                  | 3.4%                                  | 3.2%                                    |
| M0 Growth % GDP, Avg. Ann.                              | 3.1%                                  | 3.3%                                    |
| Central Bank Asset Purchases & Lending, 10yr Dur., Ann. | 0.5%                                  | 3.1%                                    |
| FX v. Price of Gold (+ means rally v. gold), Ann        | -3.2%                                 | -18.9%                                  |
| FX v. USD (TWI for USA), Ann                            | 40.2%                                 | -4.8%                                   |
| <b>Attribution of Change in Nominal Debt %NGDP</b>      |                                       |   |
| Total Debt level as % GDP: Starting Point               | 342%                                  | 368%                                    |
| Total Debt level as % GDP: Ending Point                 | 368%                                  | 334%                                    |
| Change in Total Debt (% GDP)                            | 27%                                   | -34%                                    |
| Change in Total Debt (% GDP), Ann.                      | 40%                                   | -13%                                    |
| Of Which:   |                                       |   |
| Nominal GDP Growth                                      | 20%                                   | -12%                                    |
| Real Growth   | 26%                                   | -7%                                     |
| Inflation   | -7%                                   | -5%                                     |
| Change in Nominal Debt                                  | 20%                                   | -1%                                     |
| Net New Borrowing                                       | 28%                                   | 5%                                      |
| New Borrow. Above Int. Payments                         | 0%                                    | -15%                                    |
| Interest Payments                                       | 29%                                   | 20%                                     |
| Defaults  | -8%                                   | -6%                                     |
| Of Which:   |                                       |   |
| Government Sector                                       | 20%                                   | 6%                                      |
| Private Sector  | 20%                                   | -20%                                    |

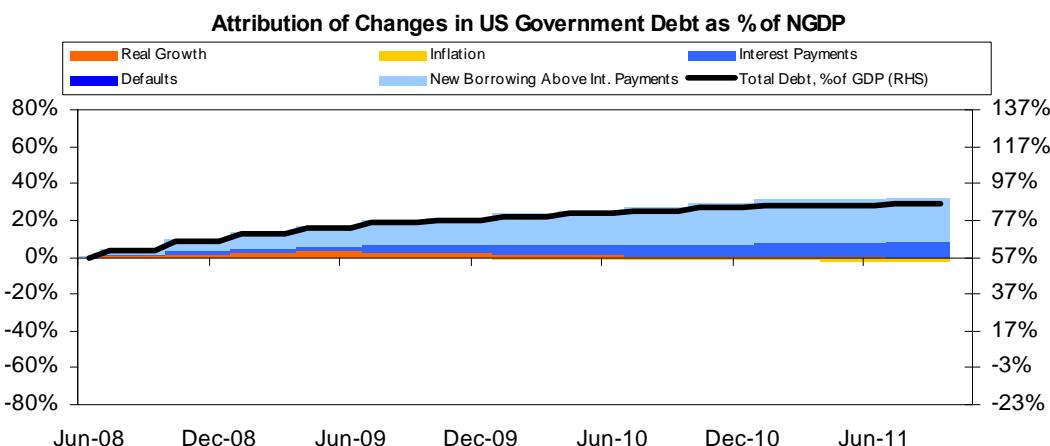
As shown, debt levels increased during the contraction phase but declined in response to reflation so that they are now down a bit from the starting point. With debt levels so high, interest payments have been a significant burden, but they have been offset by a mix of paying down debts, moderate inflation and defaults, with debt repayment the largest component.



The private sector has reduced its debt level by 37% GDP. Debt repayment has been the biggest factor here, with defaults and inflation also making contributions, more than offsetting the interest burden.

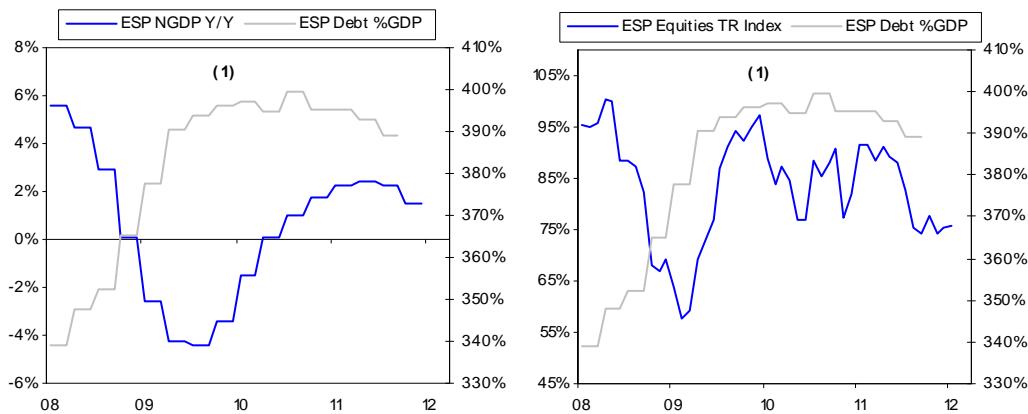


Private sector debt repayment has been somewhat (less than half) offset by government borrowing beyond interest payments.



## The Recent Spain Deleveraging, 2008-Present

As shown below, Spain has been going through the first and “ugly deflationary” phase of the cycle and has not yet moved on because it can’t “print/monetize”; it is dependent on the ECB to do this. As shown, incomes also began to fall in Spain from July 2008 and debts rose from that point from about 365% to close to 400%. Debt burdens have since stabilized but are still higher than at the start of the deleveraging. Equities initially fell nearly 45% and are still 25% below July 2008 levels.



Though Spain has not been able to print money directly, the ECB has pushed a significant amount of money into Spain by buying its bonds and providing liquidity to its banks which prevented a more severe deleveraging. It provided this support in the summer of 2010 and again in the fall of 2011, when credit tightened. During both these periods, peak purchases by the ECB pushed money into Spanish risky assets at a rate of more than 10% of Spanish GDP (adjusted to a 10-year duration). The push of money has come from a mix of sovereign and covered bond purchases, and shorter-term loans, such as the recent LTRO. Despite this printing the ECB has not pushed Spanish sovereign spreads and interest rates down enough so that nominal growth is above nominal rates (as shown later).

Understandably, in Spain the policy response has been much slower than in the US because the policy options are limited, most importantly because Spain cannot print money. And understandably, Spain has seen its credit spread climb and rising debt service costs have sent debt/income levels much higher. Unlike in our other cases, Spain's government bond yield has a substantial credit risk component because of Spain's inability to print.

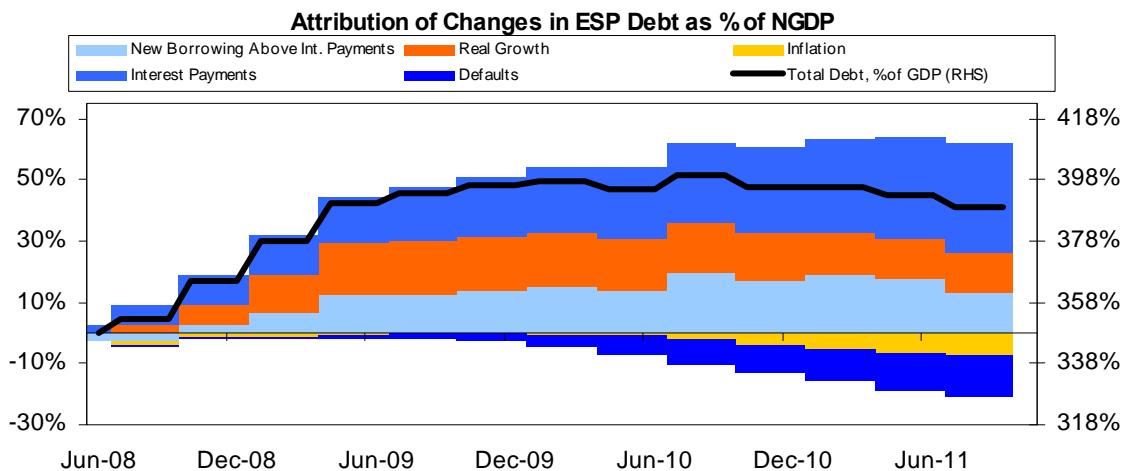
Nominal growth has been negative during the Spanish deleveraging because inflation has been 0.6% and real growth has been -1.1%. As a result, nominal growth has been 5.5% below government bond yields. The euro has devalued 20% against gold on an annualized basis, but much less against the dollar as all major currencies have devalued against gold.

| Spain:<br>09/08-Present                                 |        |
|---|--------|
| <b>Overall Economy</b>                                  |        |
| Nominal GDP Growth, Avg. Y/Y                            | -0.5%  |
| Of Which:   |        |
| GDP Deflator  | 0.6%   |
| Real  | -1.1%  |
| Productivity Growth                                     | 1.9%   |
| Employment Growth                                       | -3.1%  |
| Of Which:   |        |
| Domestic  | -1.7%  |
| Foreign   | 1.2%   |
| <b>Monetary Policy</b>                                  |        |
| Nominal GDP Growth - Gov't Bond Yield                   | -5.5%  |
| Nominal GDP Growth                                      | -0.5%  |
| Gov't Bond Yield, Avg.                                  | 5.0%   |
| M0 Growth % GDP, Avg. Ann.                              | 3.6%*  |
| Central Bank Asset Purchases & Lending, 10yr Dur., Ann. | 2.0%*  |
| FX v. Price of Gold (+ means rally v. gold), Ann        | -20.0% |
| FX v. USD (TWI for USA), Ann                            | -4.9%  |

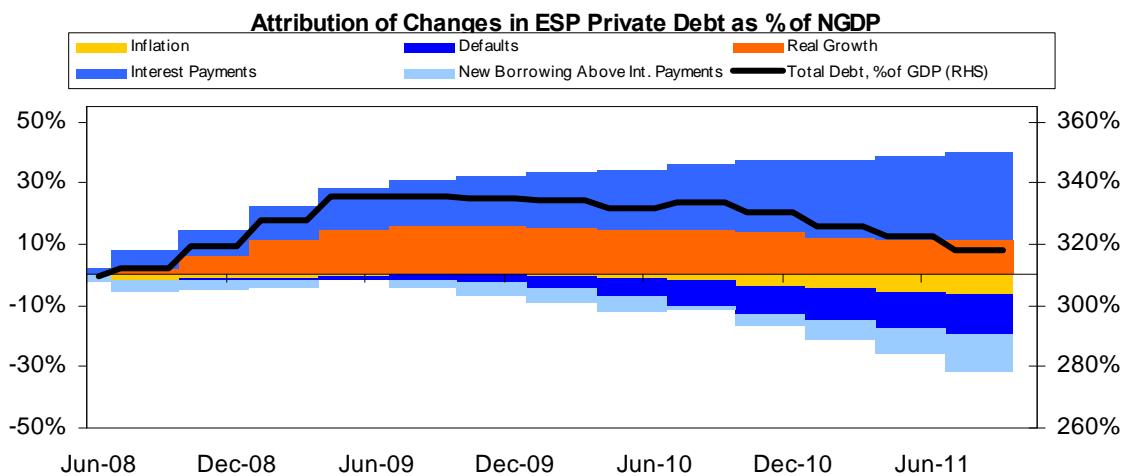
| <b>Attribution of Change in Nominal Debt %NGDP</b> |      |
|--|------|
| Total Debt level as % GDP: Starting Point          | 348% |
| Total Debt level as % GDP: Ending Point            | 389% |
| Change in Total Debt (% GDP)                       | 41%  |
| Change in Total Debt (% GDP), Ann.                 | 13%  |
| Of Which:  |      |
| Nominal GDP Growth                                 | 2%   |
| Real Growth  | 4%   |
| Inflation  | -2%  |
| Change in Nominal Debt                             | 11%  |
| Net New Borrowing                                  | 15%  |
| New Borrow. Above Int. Payments                    | 4%   |
| Interest Payments                                  | 11%  |
| Defaults   | -4%  |
| Of Which:  |      |
| Government Sector                                  | 10%  |
| Private Sector                                     | 3%   |

\*For ESP, ECB lending to ESP and ECB purchases of ESP assets is shown.

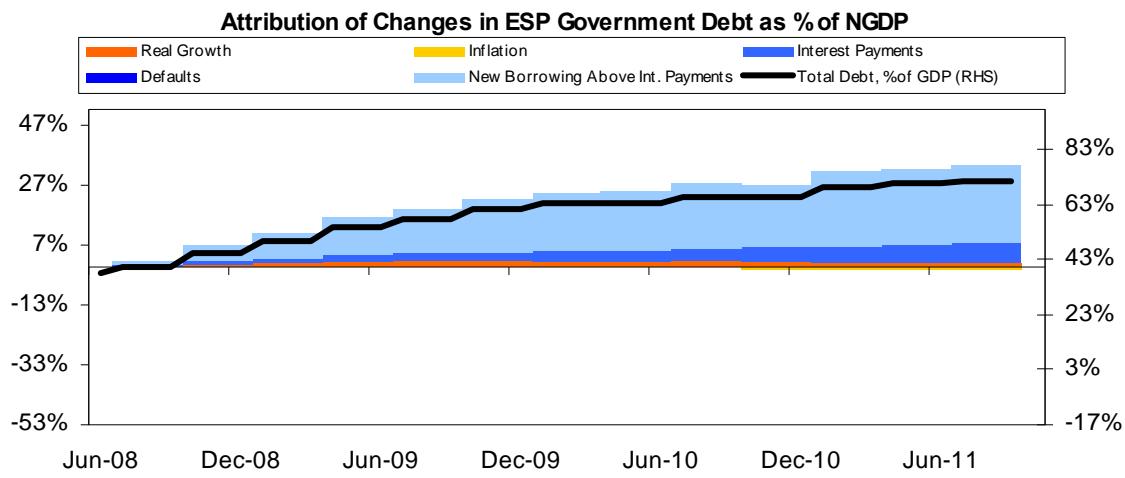
As shown below, Spain's debt level has increased due to a high and rising interest burden, new borrowing above interest payments and negative real growth. Rising interest payments are the largest component here as higher Spanish credit spreads have increased debt service costs. Inflation and defaults have moderately reduced debt burdens.



While the private sector has been repaying debt, even with debt repayment, private sector debt levels are above where they were in June 2008 (though they have recently declined) because of borrowing for interest payments and negative real growth.



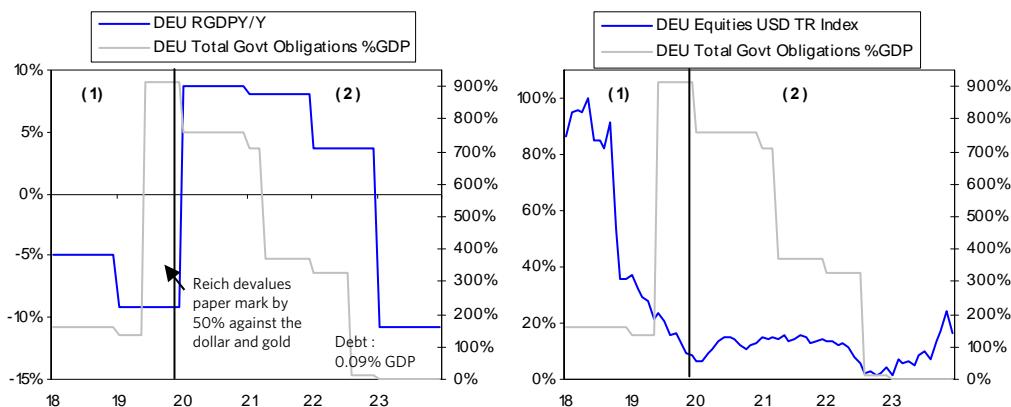
The government has levered up during the period. Government debt was relatively low at the start of the crisis and still remains a fraction of aggregate debt in Spain.



At this time, while the ECB's moves have helped, the prospects remain poor for Spain because, with monetary policies where they are, nominal growth will remain weak and too much of the adjustment process will depend on austerity and debt reduction.

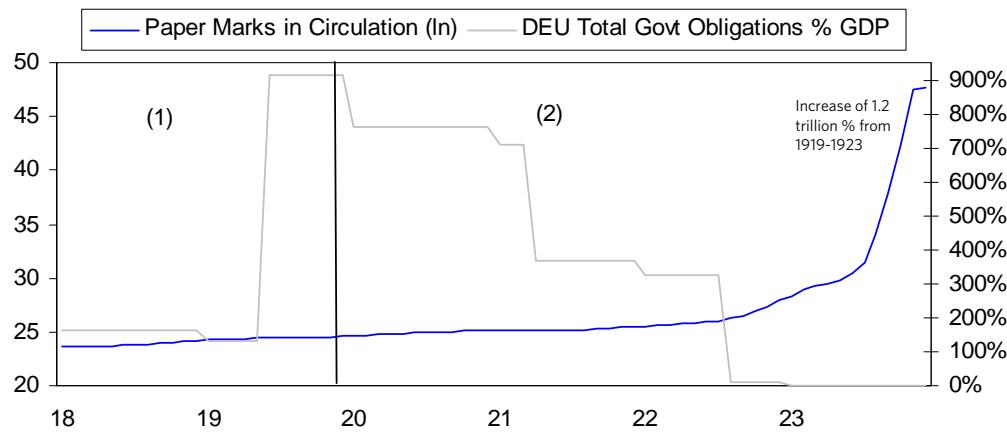
## Germany's Weimar Republic: 1918-23

Weimar Germany is a case where hyperinflation and default eroded the punishingly high debt burdens. In 1918, the government ended the war with a debt to GDP ratio of about 160% after their considerable borrowing to finance war spending. Total government obligations rose to an extraordinary level of 913% GDP after the Allied parties imposed reparation payments on Germany to be paid in gold.<sup>8</sup> 1918 and 1919 was a period of economic contraction, with real incomes falling 5% and 10% in those two years. The Reich then spurred a recovery in incomes and asset prices at the end of this period by devaluing the paper mark against the dollar and gold by 50% between December 1919 and Feb 1920. As the currency fell, inflation took off. Between 1920 and 1922, inflation eroded government debts denominated in local currency, but made no impact on the reparation debt since it was owed in gold. But in the summer of 1922, the Reich stopped making payments on reparations, effectively going into default.<sup>9</sup> Over a series of negotiations lasting until 1932, the reparation debts were restructured and effectively wiped out. The currency depreciation led creditors to favor short-term loans and to move money out of the currency which required the central bank to buy more debt in order to fill in the void. This spiral led to hyperinflation that peaked in 1923 and left local government debt at 0.09% GDP.



Sources: Global Financial Data & BW Estimates

The Reichsbank increased its printing after the 1919/20 devaluation and the printing accelerated in 1922 and 1923. By the end of the hyperinflation in 1923 the Reichsbank had increased the money supply by 1.2 trillion percent between 1919 and 1923.



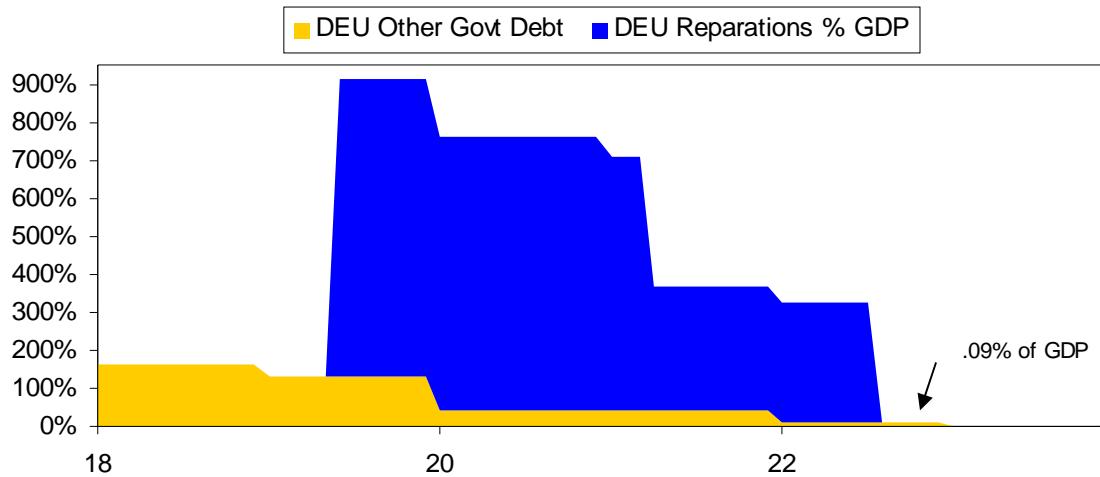
<sup>8</sup> We show the debt level rising after the 1919 Treaty of Versailles made clear the reparations would be huge; the exact amount was initially set by the start of 1921 at 269 billion gold marks and then subsequently restructured.

<sup>9</sup> In the spring of 1921 the Allied Reparations Commission restructured the reparations, cutting them by half to 132 billion marks, but this debt still remained extremely high at about 325% GDP. After the Reich stopped paying reparations in the summer of 1922, the debts were restructured multiple times – to 112 in 1929, and then basically wiped out in 1932.

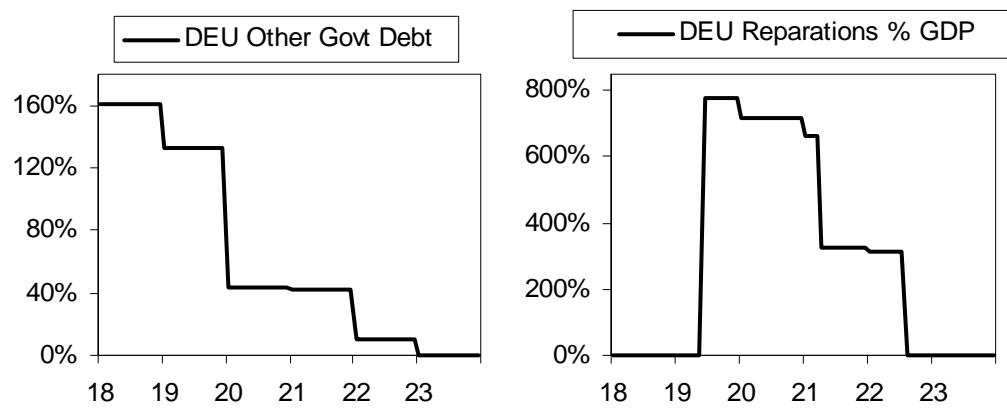
The case of Weimar is one of the most extreme inflationary deleveragings ever. At the end of the war, the Reich government was forced to choose between a shortage of cash and economic contraction or printing to stimulate incomes. The government chose to print and devalue to stimulate the economy, beginning with a 50% devaluation at the end of 1919 that brought the economy out of recession. Eventually, a loss of confidence in the currency and an extreme amount of printing led to hyperinflation and left the currency basically worthless. As shown below, the currency fell essentially 100% against gold and printing was exponential. Starting debt of 913% fell to basically zero. Non-reparations government debt of 133% GDP in 1919 was wiped out by inflation. Gold-based reparation of 780% GDP effectively went into default in the summer of 1922 when reparation payments were halted. I summarize this in the table below and then go through the pieces.

| Weimar Republic: 1919-1923                |                |
|---|----------------|
| <b>Monetary Policy</b>                    |                |
| Chg in FX v. Gold Over Period             | -100%          |
| Total % Chg in M0 Over Period             | 1.2 Trillion % |
| <b>Attribution of Change in Debt %GDP</b> |                |
| Starting Total Govt Obligations %GDP      | 913%           |
| Of Which:                                 |                |
| WWI Reparations                           | 780%           |
| Other Govt Debt                           | 133%           |
| Change in Total Govt Obligations %GDP     | -913%          |
| Of Which:                                 |                |
| WWI Reparations (Defaulted On)*           | -780%          |
| Other Govt Debt (Inflated away)           | -133%          |

The next chart shows the aggregate government obligations owed and its two pieces, the gold-based reparations and other government debt:



As discussed, the non-reparations government debt was eroded rapidly through inflation. While the reparations were not technically imposed until 1921, they effectively existed shortly after the war and it was mostly a question of negotiating how big they would be (the official amount was settled at the start of 1921 and then reduced that spring by about 50%, still a huge sum). Because the reparations were denominated in gold, they held their value until Germany ceased payments in 1922. They were then restructured several times over the next decade until they were effectively wiped out.



# US Deleveraging 1930s

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This document provides a timeline for the U.S. Deleveraging in the 1930s. I wrote it in a way to both make clear important cause and effect relationships and to convey an up-close feeling of what it was like to go through the experience as an investor. As a result, sometimes you will read about market action in detail that has no historical importance but provides perspective for investors trying to navigate such moves. For example, throughout this period there were giant market whip-saws and swings in sentiment that misled and hurt many. Also, the waves of destruction in asset values that occurred through changing market values and asset confiscations were enormous. So it is important that we, as managers of our clients' wealth, visualize how we would have navigated these changes. Only by going through this experience virtually, as well as going through the other deleveragings (the Weimar Republic in the 1920s, Latin America in the 1980s and Japan in the 1990s) and testing our strategies can we be confident that we can successfully navigate the next few years.

This timeline is meant to be read with frequent reference to the accompanying charts that show all markets and stats that I believe are important. Facts and notes for the timeline were taken from several books shown in the bibliography in the back.

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| Appendix Two: Legislative Changes 1930-1937  | pg. 109 |

## Preface

Money serves two purposes – it is a medium of exchange and a storehold of wealth. So it serves two masters – 1) those who want to obtain it for “life’s necessities,” usually by working for it and 2) those who have the value of their stored wealth tied to its value. Throughout history these two groups have been called different things – e.g., the first group has been called workers, the proletariat, and “the have-nots” and the second group has been called capitalists, investors, and “the haves.” For simplicity, I will call the first group workers and the second group investors. They, along with the government (which sets the rules), are the major players in this drama for money.

Like many dramas, this one both arises and transpires in ways that have reoccurred through time, going back to before Roman times. One man’s financial assets are another man’s financial liabilities (i.e., promises to deliver money). When the claims of financial assets are too high relative to the money available to meet them, a deleveraging arises. In the last couple of centuries, this happened when the ability to increase financial assets, most importantly credit, has been impaired because monetary policy is dysfunctional, often because interest rates are at 0% and can’t be lowered further. As a result, the claims (i.e., financial wealth) need to fall relative to what they are claims on (i.e., money). This happens through extinguishing the claims (e.g., bankruptcies) and/or increasing the supply of money.

This **fundamental imbalance** between the size of the claims on money and the supply of money has occurred many times in history and has always been resolved in some mix of the two previously mentioned ways. This resolution process is painful for all of the players. In fact, the pain has sometimes been so bad that some civilizations turned against the capitalist system (i.e., the system based on this type of capital formation). For example, some historians say that the problems that arose from credit creation were why charging interest was a sin of usury in both the Catholic Church as well as in the Arab religions. Throughout the Middle Ages, no Christian could charge interest to another Christian, so the Jews played a large part in the development of trade because it was the Jews who lent money for business ventures and financed voyages. But the Jews were also moneylenders who debtors could not repay, and this often led to anti-Semitism. Supposedly, much of the killing of Jews was caused by them holding the mortgages on property and creditors wanting to extinguish the debts. Debtor-creditor relationships have typically turned very antagonistic in these fights for money and many other patterns of human behavior that are important to know about regularly surfaced during these dramatic times. Other relationships and the actions of various players were comparably noteworthy. So it is very important for us to read these historic dramas.

The Great Depression is probably the greatest such drama in recorded history. It is certainly a classic that must be studied by anyone who cares about wealth preservation and the well-being of society. Additionally, it is the D-process that is most similar to the current dynamic because it was the last global deleveraging.

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## Conditions in 1929 Leading up to the Crash

As long as there has been money and it has been lent, the biggest issue has been the value of the money. Since being paid back with goods (e.g., wheat) doesn't work well for many reasons, debts are typically denominated in money, but lenders need some assurances that governments won't just print up a lot of it and devalue their claims. In the 1920's, these assurances were made by governments promising to exchange their money for gold at a fixed exchange rate. In other words, the world was on a gold standard back then. This played an important role in determining how events transpired in the 1920's, leading up to the crash, but I won't get into that now. The important thing to know is that the world was on a gold standard then.

1929 was a year of spectacular economic growth<sup>10</sup> which was great for both workers and investors. The unemployment rate was down to less than 1%, which was the lowest since 1920, and corporate profits were the highest that they had ever been. The stock market's strength seemed to benefit everyone. Credit was readily available which allowed a lot of borrowing to buy stocks, houses, investment assets and many other things at high prices. Prior years were similar, though less extreme.

Stockbrokers fueled the rapid expansion of their business by offering easy credit terms.<sup>11</sup> The call loan market, a relatively new and rapidly growing market, rose rapidly, quite like the securitized debt market grew in 2005-07. The diversion of funds to invest in the call loan market by corporations, foreigners, and individuals reflected a speculation in credit, motivated by attractive interest rates, that fueled the speculative mania in stocks of the period in much the same way the carry trade did in 2006-2007.<sup>12</sup>

Stocks sold at extremely high multiples financed by borrowing (i.e., margin). Many stocks were valued as much as 30 to 50 times earnings. Then money started to tighten. In May 1928, the Federal Reserve System began tightening credit, raising its discount rate to 4 ½%. It was raised again to 5% in July 1928 and to 6% in August 1929.<sup>13</sup>

Required margin deposits also rose before the crash. Most brokers became concerned about the extent of their margin loans at the high stock prices and in the face of higher interest rates in midsummer of 1929. So brokers began to raise the margin requirements on loans from 10%-25% to 50% by the Crash.<sup>14</sup> Also, prior to the Crash, brokers tried to reduce their call loan exposure on margin accounts.

Banks were strong going into the Crash and not over-leveraged. The leading banks had great strength because they had deposits that were not more than seven times their capital and surplus. This was a conservative ratio, especially when only 60% of bank assets were typically in loans and up to one-third of those were call loans, which were short-term.<sup>15</sup>

In August, the Fed eased a bit<sup>16</sup> because the economy slowed in reaction to the earlier tightening, so production peaked in most industries in the first half of the year, before the Crash.<sup>17</sup>

The peak in the market occurred on the first trading day in September, at 381 on the Dow Jones Industrial Index. Keep this price in mind as we will track the Dow's level through this timeline. Most people were bullish at the time, but a few notable, knowledgeable and independent thinkers gave warnings. For example, Roger Babson had

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<sup>10</sup> Armstrong p. 239

<sup>11</sup> Wigmore p. 26

<sup>12</sup> Wigmore p. 94

<sup>13</sup> Wigmore p. 28

<sup>14</sup> Wigmore p. 28

<sup>15</sup> Wigmore p. 100

<sup>16</sup> Wigmore p. 95

<sup>17</sup> Wigmore p. 101

"become shrill" in predicting the coming collapse of prices because of "tight money," so he recommended selling stocks in September and again in October.

In the first week of October there was a big drop in stock prices. The Dow Jones Industrial Index declined in two days from 344 to 325, or 6%. Margin calls were numerous.<sup>18</sup> Some brokers were rumored to be in trouble because of the heavy slate of initial public offerings which continued unabated. But, in the second week of October, prices bounced back to 352, though they soon started to slip again.

It became widely known that big margin calls and sell orders existed on October 24<sup>th</sup>, so everyone who worked on the exchange was alerted to be prepared. Then the collapse and panic came. There was a tidal wave of panic, not a gradual loss of confidence. The streets of the financial district were in an uproar from shortly after the opening of the Exchange as investors heard of the disaster and, unable to gain information through normal channels, went to the Exchange to seek information firsthand.

An attempt to stabilize the market was made by a small group of the biggest bankers known as "the Bankers' Pool," who committed to buy \$125 million in shares at about 12:00 noon. At midday Richard Whitney, the president of the Exchange, went on to the floor to the post for U.S. Steel and bid \$205 for 25,000 shares (over \$5 million) and other members of the pool behaved similarly. This caused a big bounce in the stock market. The leading stocks had been down 15%-20%, but they bounced early as fast as they had gone down. Professionals, speculators, and coolheaded investors bought aggressively as they believed that we had seen a correction that was a great buying opportunity. The Dow Jones Industrial Index bounced back 26 points from a low for the day of 272 (down 33) to close at 299 (down 6).<sup>19</sup> This classic pattern of big moves to support the market leading to big accompanying bounces would repeat numerous times throughout the bear market.

At the end of Black Thursday, a second organized effort to help the market was formed by a group of brokers. Some 35 leading brokers accounting for 70% of NYSE business assembled at the offices of Hornblower & Weeks and agreed that the worst was over and that they should act to reassure their customers. They took out a full page ad in the *New York Times* the next day, confidently telling the public that it was a great time to buy.<sup>20</sup> This would not be the last time that those who listened to the confident advice of their brokers and advisors would be misled. Prices started to slide again. Over the weekend, margin calls went out and foreign banks were reported to be switching out of brokers call loans and buying bankers acceptances, to seek safety. At the same time, prices were bid up for U.S. government and high grade railroad bonds, as investors sought safety.

On Monday night, margin calls were enormous, and heavy Dutch and German selling came in overnight for the Tuesday morning opening. On Tuesday morning, out-of-town banks and corporations pulled \$150 million of call loans and Wall Street was in a panic before the Exchange opened.<sup>21</sup> The Fed responded, as central banks typically do in such circumstances, by providing liquidity. The immediate problem to be dealt with by the Federal Reserve and the New York City banks was the collapse of the call loan market,<sup>22</sup> as it withdrew the credit that investors had used to fund their positions. So, the Federal Reserve Bank of New York bought \$25 million in U.S. securities to inject funds into the banking system so the banks could increase their call loans.<sup>23</sup>

Once again, opportunistic buying came into the market and the market rallied in the last 15 minutes of Tuesday, October 29th, triggering optimism.<sup>24</sup> Nonetheless, the combined decline in the Dow Jones Industrial Index for Monday and Tuesday was 20%. So, the contraction in wealth and the problems of leveraged holders of assets had begun.

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<sup>18</sup> Wigmore p. 5

<sup>19</sup> Wigmore p.6

<sup>20</sup> Wigmore p. 11

<sup>21</sup> Wigmore p. 13-15

<sup>22</sup> Wigmore p. 96

<sup>23</sup> Wigmore p. 96

<sup>24</sup> Wigmore p. 18

On Wednesday morning, October 30<sup>th</sup>, the stock market opened strong. The NYSE announced after Wednesday's close that trading on Thursday, October 31<sup>st</sup>, would begin at noon and that the Exchange would close on Friday and Saturday to catch up on paperwork.

Then the Federal Reserve Bank of New York cut its discount rate from 6% to 5% in coordination with the Bank of England, which cut its bank rate from 6 ½% to 6%.<sup>25</sup> Classically, the announcements stimulated strong buying when the exchange opened, but not enough to cause prices to go to new highs. So the rally didn't last, as leveraged longs were being squeezed.

Stocks continued to plunge the next week, starting with a stampede to sell when the NYSE opened on Monday, November 4<sup>th</sup>. On Tuesday the exchanges were closed for Armistice Day. On Wednesday, November 6<sup>th</sup>, the stock markets opened with heavy selling. Stocks continued to fall the next week.<sup>26</sup>

The Crash helped high grade and railroad bonds and hurt BAA and other lower quality bonds. The yields on BAA industrial and utility bonds dropped a little, in contrast to high grade bonds, so that the yield spreads between BAA and AA bonds became the widest in 1929.

Municipal bonds constituted one of the larger securities markets in 1929, second only to the U.S. government bond market. In 1929 the municipal bond market behaved much like the corporate bond market. Bond prices declined enough to raise yields by ¼% to ½%, a progression throughout the year in response to the investor surge into the stock market and tightening short-term credit conditions and then prices rose and yields declined during the Crash as investors leaving the stock market created a strong demand for high quality municipals.

However, some regions where there was a financial bubble, such as Florida, were already in default. More Florida defaults were anticipated, including a default by Miami, whose bonds yielded 5.75%, 1% above any other major city's bonds.

On Wednesday, November 13<sup>th</sup>, John D. Rockefeller placed a bid for 1 million shares of Standard Oil (N.J.) at \$50, down \$33 from its 1929 high of \$83. Then, the administration felt that it had to do something so, after the close on November 13<sup>th</sup>, Treasury Secretary Mellon announced that the United States would reduce corporate and individual income taxes by 1% to stimulate confidence, and they prohibited short selling. In response to these moves and to stocks appearing cheap, the market bottomed on November 14<sup>th</sup> and rallied 25% through December.<sup>27</sup>

Most everyone thought the problems were over and many regretted not buying when prices were cheap. Speculators resumed their past activities. The Chairman of the Chase National Bank reinvested heavily in stocks. William Durant created a new pool in Radio Corp. of America stock. The Chairman of General Theatres Equipment, Inc., organized a new pool in his own company's 6% convertible debentures with Chase Securities, etc.<sup>28</sup>

## Government Policies

Herbert Hoover had been president only seven months when the Crash occurred. The day after the Crash he issued his famous statement: "The fundamental business of the country, that is production and distribution of commodities, is on a sound and prosperous basis."

Contrary to what is popularly believed, the Hoover Administration was prompt and positive in its reaction to the Crash. For example, Hoover arranged for a committee of 400 businessmen to advise the President on business

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<sup>25</sup> Wigmore p. 19

<sup>26</sup> Wigmore p. 22

<sup>27</sup> Wigmore p. 25

<sup>28</sup> Wigmore p. 25

conditions. It was led by a "Committee of 72", which was made up of men who seemed like titans in the business and social world of the 1920s,<sup>29</sup> so it consisted of the best of the best. The Hoover Administration hoped that the Crash would destroy excessive speculation but not the economy,<sup>30</sup> much the same way the Bush administration viewed the initial declines as a healthy correction of speculative excesses. The federal government also expanded its public works plans to \$250 million for 1930. This constituted the most active and direct role in the economy taken by the federal government in generations, and the policy appeared to work.

Also, Hoover's policy supported the Federal Reserve in its policy of credit easing.<sup>31</sup> President Hoover's attack on the impending Depression, together with the easy money that the Fed provided, were generally expected to produce an economic upswing by mid-1930.

As mentioned, the Fed eased aggressively when the crash occurred. The day before Black Thursday the New York Federal Reserve reduced its buying rate for bankers acceptances from 5 1/8% to 5%. Then, during the Crash, the New York Federal Reserve reduced its discount rate from 6% to 5% on November 1st and to 4 1/2% on November 15<sup>th</sup>. On the same dates, it reduced its buying rate for bankers acceptances to 4 3/4% and 4 1/4%. Another reduction to 4% on November 21<sup>st</sup> prevailed until January 31<sup>st</sup>, 1930.<sup>32</sup>

## 1H1930

### Optimism Returns

In 1930 it was widely believed that the stock market action had had a 50% correction<sup>33</sup> that was over, largely because those sorts of moves are what people remembered.

A number of well-known analysts pointed to value and earnings as reasons why the market was fundamentally sound. Then, like now, people remembered past cyclical downturns, especially those in 1920, 1914 and 1907, and pointed out that 50% corrections occurred in these cases and that the worst was over back in 1920 within 130 days of the top. However, the reasons for the various panics prior to 1929 were different. In some cases, panics were caused by drastic declines in the gold reserves prompting a lack of confidence in government's ability to meet its debts with sound money, which sent capital fleeing from banks into safe securities and even into hoarding gold. In other cases, panic was created by natural disasters which seriously disrupted the cash flow between various sectors of the United States, sparking bank failures which gave rise to the birth of the Federal Reserve.<sup>34</sup> The optimism wasn't just confined to market participants. All the Federal Reserve districts predicted an upturn in the economy in the second half of 1930. The commercial banks also forecast an upturn. So, in 1H1930, optimism prevailed.

The banking system was considered strong at the time.<sup>35</sup> Loans and investments of all member banks expanded steadily through 1930. Their investments in U.S. government securities, municipals, railroad bonds, utility bonds, and foreign bonds all expanded throughout the year, and the new-issue market for common stocks recovered, too.<sup>36</sup>

From the depths of the panic in late 1929, the market had begun to recover moving through the first quarter of 1930.<sup>37</sup> The stock market rose strongly in the first four months of 1930. For those who still had money, 1930 held the opportunity for a killing.<sup>38</sup> Stocks seemed cheap because they fell faster than the economy, so prices

<sup>29</sup> Wigmore p. 89-90

<sup>30</sup> Wigmore p. 89-90

<sup>31</sup> Wigmore p 113

<sup>32</sup> Wigmore p. 96

<sup>33</sup> Armstrong p. 242

<sup>34</sup> Armstrong p. 337

<sup>35</sup> Wigmore p. 116

<sup>36</sup> Wigmore p. 119

<sup>37</sup> Armstrong p. 242

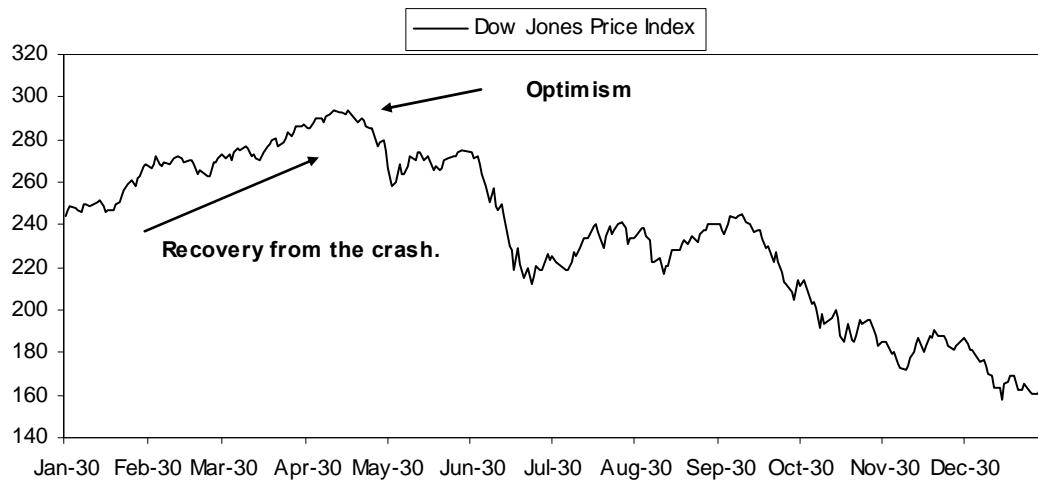
<sup>38</sup> Wigmore p.137

were low in relation to earnings. For example, AT&T was only off 0.1% in earnings, yet the stock price was 25% lower than at the 1929 high.<sup>39</sup> Outside Wall Street, industry looked strong. So in the first quarter of 1930 it was widely believed that stocks were clearly in a 50% correction and nothing more,<sup>40</sup> so stocks rose as the Fed eased and the Hoover administration was responsive to the problems.<sup>41</sup> On March 31, Congress passed a stimulus package called the Public Buildings Act and on April 4 approved an appropriation for state road building projects in order to help stimulate the economy.

Bonds remained steady during January and February despite the Fed's cut in the discount rate during February, but in March they rallied in response to a second cut to 3.5%. The Fed had cut the discount rate from 6% to 3.5% in just seven months in an attempt to halt the decline in the economy. Interest rates plummeted straight down during the first quarter of 1930.<sup>42</sup>

As mentioned, the Fed bought a lot of T-Bills following the crash and until March 1930. Additionally, it is noteworthy that the Directors of the New York Fed and its professional staff wanted to buy a lot of U.S. government bonds to prevent the decline in Federal Reserve credit resulting from the decline in the Federal Reserve's bill holdings. However, the Federal Reserve Board in Washington opposed the New York bank's requests, fearing that it would scare foreign investors and weaken the dollar.<sup>43</sup>

For all these reasons, optimism ran fairly high during the first quarter of 1930.<sup>44</sup> By April 10<sup>th</sup>, the Dow had rallied back up to 293.36. But poor earnings reports continued. In that sense, the stock market action, economic activity, Fed moves and the administration's moves were broadly similar to those in 2008 and early 2009. In other words, despite monetary and fiscal stimulation and a general sense that stocks had gotten cheap and the economy was in a normal contraction, economic weakness persisted and dragged stocks lower.



Source: Global Financial Data

<sup>39</sup> Armstrong p. 254

<sup>40</sup> Armstrong p. 242

<sup>41</sup> Wigmore p. 138

<sup>42</sup> Armstrong p. 242

<sup>43</sup> Wigmore p. 117

<sup>44</sup> Armstrong p. 242

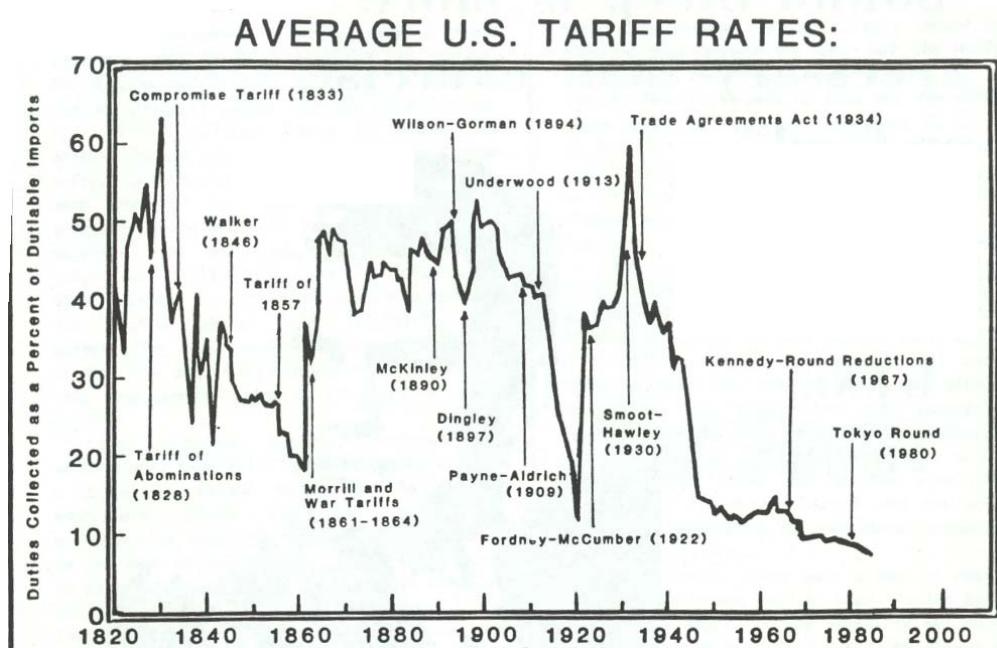
## 2H1930

### Trade Wars, Economic Weakness, Financial Losses, and the Smoot-Hawley Tariff Act

The economic weakness was global as well as domestic. During this second quarter of 1930 world trade and production declined and unemployment increased.<sup>45</sup> Even with a big fiscal stimulus (about 1% of GDP), and the Fed easing, the world economy weakened. Naturally (i.e., typical of bad downturns) trade tensions and protectionist sentiment emerged. In the U.S., it was widely argued that industries would rebound as long as Europe was forced to stop its dumping policies. While workers and capitalists in industries that had to compete with imports generally liked tariffs, foreigners and those who traded or dealt in world markets didn't. As the week of June 16 began, the news of what would become known as the Smoot-Hawley Tariff Act weighed on the stock market<sup>46</sup> even though it raised by tariffs by only 20%. Though workers liked tariffs, investors did not. On Monday, June 16<sup>th</sup>, stocks gapped down. The Dow Jones industrials plummeted to 212.27, closing the week at 215.30.<sup>47</sup> The selling pressure continued the following week as the industrials fell to 207.74, off 14.9% from the close of June 14.

The Senate and the House passed the Smoot-Hawley Tariff bill on June 17, raising U.S. tariffs by 20% on average, making U.S. tariffs the highest in the world. Several other countries immediately did the same.<sup>48</sup>

To convey how tariffs changed over time, most importantly how they increased in economic bad times, we show the following interesting chart that we stumbled across. Protectionism is an almost certain consequence of economic bad times.



Source: Armstrong, "The Greatest Bull Market in History"

<sup>45</sup> Armstrong p. 260

<sup>46</sup> Armstrong p. 258

<sup>47</sup> Armstrong p. 260

<sup>48</sup> Wigmore p. 115

It is a mistake to attribute the deleveraging to the Smoot-Hawley tariff,<sup>49</sup> as U.S. exports as a percentage of GDP in terms of constant dollars were only 5.28% in 1929 and declined to 4.44% in 1931, so they were rather small and declined a bit more than proportionally with the total economy. The economic contraction which took place worldwide was primarily created by the asset bubble bursting and the debt crisis emerging.

Hoover planned a fiscal 1931 budget surplus, but the likelihood of a surplus diminished as 1930 progressed. In the fiscal year ending June 1931 there was a budget deficit of \$463 million because of a \$1 billion decline in federal receipts. Increasing budget deficits in periods of economic hardship are virtually inevitable.

## The Real Economy Deteriorates

In the second half of 1930, the economy weakened.<sup>50</sup> Then, as now, auto production dropped to about 50% of capacity and the commodities-based industries, such as the oil, mining, farm equipment, and pulp and paper industries, suffered declines.<sup>51</sup> In less than two quarters steel production utilization dropped from 95% to 60% of capacity and commodities prices fell sharply. Housing and mortgage debt collapsed.<sup>52</sup> Classically, these industries decline as the demand for discretionary durables, oil and commodities used in production declines.

On September 9, 1930, President Hoover stopped all immigration with the exception of tourists, students and professional men and women, and the Labor Department was also instructed to rigidly enforce the laws against illegal aliens, so in 1930 thousands of deportations were made.<sup>53</sup> Moves to curtail immigration and to force immigrants to leave the country are also typical of deleveragings.

At the end of the year the index of prices for 47 farm products was down 29.3% from pre-Crash prices, and publicly traded industrial commodities averaged a price decline of approximately 25%. Hoover declared that speculators who sold commodities short were conspiring against the public welfare.<sup>54</sup> Demonizing those who made money betting on the decline is also typical of deleveragings.

In 1930, earnings declined. According to a survey by Moody's taken of the first 744 companies to report on their 1930 earnings, there was a 23.2% average decline in corporate earnings in comparison to 1929's strong earnings. But this average figure is a bit misleading because of differences. Of the total, half were industrial corporations, which posted a decline in earnings of 35.9% for 1930,<sup>55</sup> while other industries such as utilities (including the telephone and telegraph companies) were unaffected. In fact, through most of 1930, many industries were not yet doing all that badly as consumer spending did not drop off that sharply at this point. So, the 1930s fall in earnings looked like a shallow recession.

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<sup>49</sup> Armstrong p. 266

<sup>50</sup> Wigmore p. 130

<sup>51</sup> Wigmore p. 193

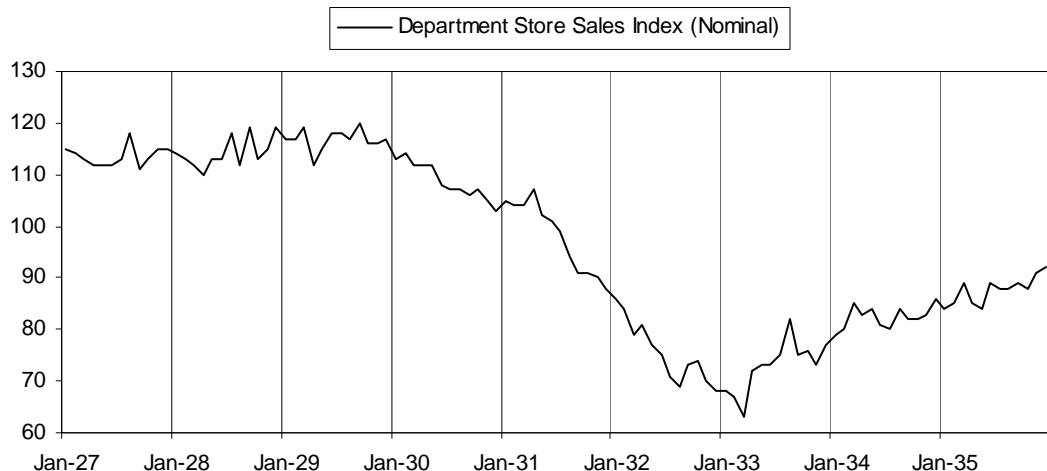
<sup>52</sup> Armstrong p. 282

<sup>53</sup> Armstrong p. 284

<sup>54</sup> Wigmore p. 133

<sup>55</sup> Armstrong p. 309

The chart below shows department store sales. Notice how they slipped, but did not collapse, in 1930.



June was the worst month for the stock market in 1930. The Dow Jones Industrial Index dropped almost 23%,<sup>56</sup> commodities prices broke their lowest levels since 1914 and the Smoot-Hawley tariff was passed. Lowering money rates and reducing brokers loans had no effect.<sup>57</sup> Then, as now, the Treasury bond market was strong while credit spreads widened.<sup>58</sup>

The stock market stabilized for the summer months, though the news was bad – e.g., Miami defaulted, Warner Bros. and Shell Union Oil halted their dividends, and the budget deficit outlook worsened.<sup>59</sup>

However, the majority of market analysts began to turn bullish during August of 1930 and prices rallied to a peak of 247 on September 10<sup>th</sup>, though the economy continued to slide and liquidity fears<sup>60</sup> were beginning to arise. Once again, market participants over-anticipated a recovery that didn't materialize, and the disappointing reality of the economy drove prices lower.

Railroads then were like autos now, in that they had problems rolling their maturing debts and faced large rollovers ahead (in 1931) and the government considered providing them with special loans because they were considered to be an essential industry that was too important to allow to fail. For this reason, the story of the railroads during the Great Depression is worth noting for those trying to anticipate the fate of the autos over the next few years.

Then, like in 2008, despite a severe decline in government interest rates, corporate bonds eventually collapsed<sup>61</sup> as public confidence gave way and mortgage spreads to treasuries increased. Specifically, interest rates on first mortgages stayed at 5.5% to 6% while seconds yielded at least 7%, because despite the decline in government rates, banks were still maintaining high rates on mortgages<sup>62</sup> because of the increased credit risks and the banks fears of illiquidity. Municipal bonds and municipal governments did well in 1930 until credit fears developed in the last quarter.<sup>63</sup>

In October of 1930, the stock market broke its November 1929 lows.<sup>64</sup>

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<sup>56</sup> Wigmore p. 141

<sup>57</sup> Armstrong p. 275

<sup>58</sup> Wigmore p. 198

<sup>59</sup> Wigmore p. 142

<sup>60</sup> Armstrong p. 283

<sup>61</sup> Armstrong p. 242

<sup>62</sup> Armstrong p. 282

<sup>63</sup> Wigmore p. 206

<sup>64</sup> Armstrong p. 283

## Bank Failures Begin

During the Crash and in 1930, there was a lot of talk about the strength of the banking system and the strength of the banks was expected to limit the duration of the contraction. Bank earnings generally declined only 25%-30% in 1930, and four of the top ten banks paid higher dividends in 1930. So, banks appeared strong through most of 1930.<sup>65</sup>

However, some banks began to look vulnerable when the economy and stock market weakened late in 1930. The decline in the stock market in the second half of 1930 made some banks especially vulnerable because they owned stocks.<sup>66</sup> Also, some important banks had also engaged in unsound speculation and made unsound loans. Other banks were affected by the impact of declining commodities prices on their customers' credit and by the worsening economic conditions, particularly those banks that had large real estate loans. Runs eventually occurred in numerous cities during 1930. However, the majority of early bank failures were confined to banks in the Midwest and country banks that had a lot of money in real estate loans.<sup>67</sup>

Many bankers had liquidity problems because they held many illiquid foreign bonds, real estate loans, railroad loans, and investment loans, so they sought safety and liquidity in the short-term market then, in much the same was as they did in 2008 and early 2009. During the first six months of 1930, 471 banks failed, though none of the big ones.

Then, like now, the velocity of money fell as credit contracted and people moved to holding cash. The hoarding of gold coins began to increase by late 1929 as the government stopped issuing new gold coinage.<sup>68</sup>

Through all of 1930, 1,350 banks suspended operations, compared with 659 banks in 1929,<sup>69</sup> but bank failures weren't a big worry.<sup>70</sup> Also, Wall St. brokerage firms started failing.<sup>71</sup> Financial companies which had employed high leverage in 1929 paid a heavy price for it in 1930.<sup>72</sup> Goldman Sachs Trading wrote down its portfolio value \$165 million at the end of 1930 in order to bring it to market value. Then, as now, almost half the write-offs were on securities for which no adequate public market existed.<sup>73</sup> Also, investment funds at the Wall Street firms began to collapse as managers lost most of their clients' money. For example, Goldman Sachs' two leading funds both fell by about 90%.

It wasn't until December 1930 that bank failures became a big deal. Until then, the majority of bank failures had been in the Midwest. But in December, the Bankers Trust Co. in Philadelphia failed, which was followed by the failure of the Bank of United States.<sup>74</sup> Manufacturers Trust Company also experienced runs at some branches and needed help from the Clearing House Association. Bank stocks plunged. The reputations of U.S. banks suffered abroad, where the Bank of United States was thought to be more important than it actually was because of its name.<sup>75</sup>

Back then, there was no active lender-of-last-resort role at the Federal Reserve to deal with smaller regional banks, so the Bank of United States got no lender-of-last-resort loans. The Federal Reserve did what its role proscribed when bank suspensions accelerated in November and December 1930, i.e., it increased its open

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<sup>65</sup> Wigmore p. 161

<sup>66</sup> Wigmore p. 121

<sup>67</sup> Wigmore p. 120

<sup>68</sup> Armstrong p. 276

<sup>69</sup> Wigmore p. 122

<sup>70</sup> Armstrong p. 274

<sup>71</sup> Armstrong p. 283

<sup>72</sup> Wigmore p. 193

<sup>73</sup> Wigmore p. 155-157

<sup>74</sup> Armstrong p. 285-6

<sup>75</sup> Wigmore p. 125

market purchases aggressively, so that its holdings of T-bills doubled by December 31<sup>st</sup>.<sup>76</sup> Back then, the role of the Federal Reserve was to control money supply and not to determine who got money and who didn't. Political shifts follow economic shifts. This time was no different. The Democrats swept Congress in the November mid-term elections. Still, at the end of 1930, a majority of those in finance and business predicted that there would be an economic recovery in 1931.<sup>77</sup>

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<sup>76</sup> Wigmore p. 126

<sup>77</sup> Wigmore p. 208

## International Problems

The foreign debt problem had also become a big drag on the global economy, which hurt the U.S. economy. Then, as now, these debts were heavily denominated in U.S. dollars. Then, the Chairman of the Federal Reserve Board privately advised Hoover to cut war debts by 70% and reparations by 40% to improve international trade and financial conditions, but this was rejected because it was felt that the U.S. needed the money.<sup>78</sup> All the countries of Western Europe and the United Kingdom had dollar-denominated bond issues after the war and, in varying degrees, were facing problems coming up with dollars, which then, as this time around, strengthened the dollar.

In the boom years, emerging market debt had become popular as it seemed to offer higher interest rates with not much risk. Issues of South American governments had been especially popular. For example, Argentine bonds were rated Aa by Moody's, which also gave an A bond rating to Buenos Aires, Chile, Cuba, Peru, Rio Grande do Sul, and Uruguay. Bolivia, Brazil, Colombia, and Rio de Janeiro were rated Baa, which still implied investment quality. Rates on these bonds were 1%-2% over comparably rated domestic corporate issues in 1928-1929 when the carry trade was popular.<sup>79</sup> But in 1930, U.S. investors didn't want to roll over maturing foreign debt.<sup>80</sup> Foreign governments with maturing issues had to resort to short-term borrowing. Then, as now, these countries didn't get loans from the U.S. government. Later in the deleveraging, many of these countries defaulted on their U.S. bond issues.

France and Great Britain were heavily in debt to the United States, but the greatest source of instability was Germany, which had built up massive international short-term debts that it could not service or roll. Germany had a huge reparations burden, it lacked foreign exchange reserves, the savings of individuals had been wiped out by hyperinflation in the early 1920s, and the rest of Europe feared a rebirth of German militarism so it tried to hold Germany back economically. Since hyperinflation and reparations payments eliminated domestic savings, both German industry and government were forced to borrow abroad.<sup>81</sup> As it was short of cash, Germany's central bank, the Reichsbank, raised its rate from 4% to 5% in October in order to raise short-term funds.<sup>82</sup> By this time Hitler had emerged on the scene and created a problem for the governing Social Democrats, thus destabilizing their ability to govern, making investors more wary about lending to Germany.

Similarly, economic problems in South America caused political and social problems there. In September there was a revolt in Chile and a revolution in Argentina and in October a rebel coup in Brazil.<sup>83</sup> Naturally, this turbulence scared investors both foreign and domestic, and this scared capital away, worsening their problems!

During such times of great stress, political and social polarization emerges as various strongly held opposing views, especially of "the have-nots" (workers) and "the haves" (investors), and this makes it difficult for leaders to govern. Such periods are great test of whether a nation's system of checks and balances really works or paralyzes decision making.

## 1Q1931

Still, in January 1931, most people confidently expected an imminent recovery. For example, at their January 1931 annual meetings, virtually all bank chairmen predicted a business recovery during 1931. So did politicians, financiers, businessmen, and even Europeans, who had been the most skeptical of similar predictions in early

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<sup>78</sup> Wigmore p. 116

<sup>79</sup> Wigmore p. 199

<sup>80</sup> Wigmore p. 203

<sup>81</sup> Wigmore p. 202

<sup>82</sup> Wigmore p. 205

<sup>83</sup> Wigmore p. 205

1930.<sup>84</sup> This is because the problems still seemed manageable, so there was a presumption that there would be a return to this norm.

February 1931 was a month of mixed economic data. The Dow Jones Industrial Average rallied sharply during February as confidence returned. For three weeks prior to Washington's Birthday, stocks rose and there were stories of big bears caught short and big M&A deals rumored. International Telephone & Telegraph gained 100% from its January low and there were rumors that it would again attempt to buy Radio Corp's communication business. These developments worried investors with cash and shorts that they'd miss out on the return to normalcy, so they bought, causing a buying panic. Optimism was pervasive and broadly expressed. The Dow Jones Industrials rallied 20% from the December low and selected stocks doubled,<sup>85</sup> so there was no doubt that the economy was on the road to recovery.

On stocks, the head of Chase bank commented: "I do not know whether we shall see lower prices in the stock market or not...There are many securities, both stocks and bonds, which are now selling for less than they will be worth in normal times and at prices which should prove attractive to the investor." His conclusion and forecast were: "I think that we are approximately at the worst of the Depression and that the next important move will be upward...I expect conditions at the end of 1931 to be a good deal better than they are at the end of 1930."<sup>86</sup> In January, even Paul Moritz Warburg, who had become somewhat of a respected soothsayer for identifying the "speculative orgy" just prior to the collapse and who was a well-known banker and a director of the Manhattan Co., said "from the banker's point of view, I do not hesitate to say that within a few years hence the level at which some of our securities sell today will look...incomprehensibly low...even though one might anticipate a year or two of reduced dividends."<sup>87</sup>

Similarly, the President of U.S. Steel, James Augustine Farrell, was quoted in *Time* magazine saying that stocks had reached "the low from which an uptrend was now in motion" and the chairman of both RCA and General Electric, Owen D. Young, stated before the American Bankers Association meeting that in his opinion improvement was at hand. Numerous leaders within industry echoed these opinions. Also, in February 1931 the Federal Reserve Board declared that the banking system was much stronger than 18 months earlier. At the same time, state and local governments were generally considered strong and creditworthy.

Investors shared this view, and the Dow Jones Industrials rallied into February, exceeding the January high as well as the highs that had been established during both November and December of 1930.<sup>88</sup> The chart below shows the rally and what subsequently happened. Once again, sentiment affected stock prices and the economy, and knowledgeable people confidently gave misleading advice that sucked people with cash into the market and shorts out of the market, hurting both. I point this out to show how misleading a consensus of experts and market movements can be.<sup>89</sup>

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<sup>84</sup> Wigmore p. 208

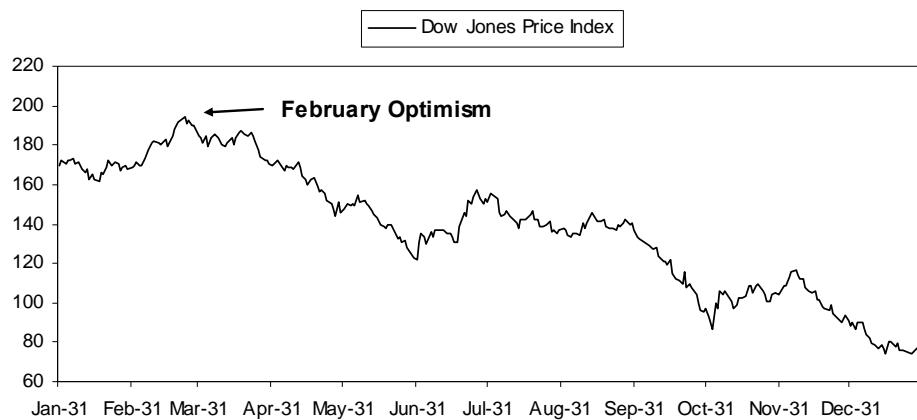
<sup>85</sup> Armstrong p. 316-7

<sup>86</sup> Armstrong p. 302

<sup>87</sup> Armstrong p. 303-304

<sup>88</sup> Armstrong p. 307

<sup>89</sup> Armstrong p. 303



Source: Global Financial Data

Along with the rally in stocks, railroad bonds rallied in February, exceeding the highs of December 1930 and January 1931. Corporate and municipal bond defaults started to pick up in 1931.<sup>90</sup> Real estate backed bonds were one of the worst investments, second only to foreign bonds.<sup>91</sup> Interestingly, bond defaults caused more losses than stock market declines in the Depression. In fact, supposedly losses on investments in foreign bonds were greater than losses on investments in stocks.<sup>92</sup> Stocks, at least, could be sold at a price quoted on the exchange. Bond issues backed by real estate simply went into default and were illiquid.

## Wages and Consumer Finance

At this time, there were greatly divergent views about how to solve the Depression. For example, some people thought that wages should be pushed up and others thought they should fall. For example, the president of the Chase National Bank, which was the largest bank in the U.S. at the time, Albert Wiggins, said "it is not true that high wages make prosperity. Instead, prosperity makes high wages. Many industries may reasonably ask labor to accept a reduction of wages designed to reduce costs and to increase both employment and the buying power of labor."<sup>93</sup> Others argued that by lowering wages it would reduce the cost of production, thereby reducing retail prices and stimulating purchases, which would speed recovery.

Naturally, price wars were taking place in many industries as businesses with high fixed capacity wanted to get any incremental contributions possible, even though these revenues were at a loss.<sup>94</sup>

Despite interest rates declining, banks did not lend much to individuals because of their perceived credit and liquidity risks. Credit spreads blew out. The small individual seeking to borrow money was typically forced to pay over 40% a year! A common practice was that a wage earner's pay check was postdated. This gave rise to the often termed "salary-purchasers." These people offered \$50 for a \$55 paycheck, taking advantage of the person who needed the cash immediately. Pawnbrokers were reported to be lending money at the highest possible legal rate and then forcing the client to pay \$10 for \$1 worth of merchandise to get around the laws. The "usurers" would collect \$10 a month interest on a \$50 loan for years at times. Below is a report showing average lending rates from various types of lenders to small individuals.<sup>95</sup>

*Annual Interest Rate Charged*

|                               | Range of Interest % |      |
|-------------------------------|---------------------|------|
|                               | Low                 | High |
| <b>Life Insurance Co</b>      | 6%                  | 6%   |
| <b>Building and Loan Soc</b>  | 6%                  | 12%  |
| <b>Credit Union</b>           | 6%                  | 18%  |
| <b>Commercial Banks</b>       | 9%                  | 22%  |
| <b>Installment Finance Co</b> | 16%                 | 25%  |
| <b>Industrial Banks</b>       | 17%                 | 34%  |
| <b>Remedial Loan Soc</b>      | 12%                 | 36%  |
| <b>Personal Finance Co</b>    | 30%                 | 42%  |
| <b>Pawnbrokers</b>            | 12%                 | 120% |
| <b>Salary Buyers</b>          | 120%                | 480% |

<sup>90</sup> Armstrong p. 307

<sup>91</sup> Armstrong p. 300

<sup>92</sup> Armstrong p. 360

<sup>93</sup> Armstrong p. 302

<sup>94</sup> Armstrong p. 310

<sup>95</sup> Armstrong p. 319

Stocks slipped at the end of the first quarter as earnings disappointed (see table below). In March, the Dow Jones Industrials fell, closing March virtually on the low near the 171 level. The long bonds rallied, not by much, though they went to a new high for the year during March.<sup>96</sup>

*1Q 1931 Earnings  
(thousands of dollars)*

|                           | <b>1931</b> | <b>1930</b> | <b>%Chng</b> |
|---------------------------|-------------|-------------|--------------|
| <b>American Bank Note</b> | 1,019       | 1523        | -33%         |
| <b>Borg Warner</b>        | 325         | 1097        | -70%         |
| <b>Caterpillar</b>        | 1,031       | 3365        | -69%         |
| <b>Chrysler</b>           | -979        | 180         | -644%        |
| <b>Corn Products Ref</b>  | 2,389       | 3152        | -24%         |
| <b>Curtis Publishing</b>  | 4,654       | 6533        | -29%         |
| <b>General Electric</b>   | 11,488      | 15042       | -24%         |
| <b>General Foods</b>      | 5,572       | 5990        | -7%          |
| <b>General Motors</b>     | 28,999      | 44968       | -36%         |
| <b>Gillette</b>           | 1,421       | 2164        | -34%         |
| <b>Hudson Motor Car</b>   | 226         | 2316        | -90%         |
| <b>Hupp Motor Car</b>     | -680        | 66          | -1130%       |
| <b>McGraw Hill Pub</b>    | 372         | 534         | -30%         |
| <b>Montgomery Ward</b>    | -1,783      | -2318       | 30%          |
| <b>National Cash Regs</b> | -373        | 912         | -141%        |
| <b>Otis Steel</b>         | 20          | 634         | -97%         |
| <b>Packard Motor Car</b>  | 113         | 2654        | -96%         |
| <b>du Pont</b>            | 12,656      | 17347       | -27%         |
| <b>Studebaker</b>         | 809         | 1347        | -40%         |
| <b>Westinghouse Elec</b>  | -2,885      | 4546        | -163%        |

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<sup>96</sup> Armstrong p. 319

## 2Q1931

### The Global Dollar Shortage Caused a Global Debt Crisis and a Strong Dollar

Because lots of debts were denominated in dollars and the ability to earn dollars fell (because of reduced US imports), and because the ability to borrow dollars also fell as credit tightened, a global dollar shortage emerged. Of course, simultaneously there were lots of debts denominated in all currencies that couldn't be paid, though dollars were especially short.<sup>97</sup>

Time magazine reported that the president of the Chase National bank said, "The most serious of the adverse factors affecting business is the inability to obtain dollars in amounts sufficient both to make interest and amortization payments on their debts to us and to buy our exports in adequate volume. Cancellation or reduction of the inter-allied debts has been increasingly discussed throughout the world. This question has an importance far beyond the dollar magnitude of the debts involved...I am firmly convinced it would be good business for our Government to initiate a reduction in these debts at this time."

The battle for world trade continued to lead to more trade barriers. With the trade war going on, foreign nations were unable to earn enough dollars to make payments on their outstanding loans.<sup>98</sup> The effects of the deleveraging were becoming severe in Canada which was a prominent trading partner. Canada imposed tariffs so stiff against U.S. Steel that U.S. owners were forced to sell off assets in Canada.<sup>99</sup>

Fears over the banking situation were as alive in Europe as they were within the United States.<sup>100</sup> The Treaty of Versailles had isolated Germany and Austria, reducing their economic viability significantly. The practices of "printing" paper money which came about via deficit spending that was monetized created higher rates of inflation in Europe.<sup>101</sup> Germany was saddled with reparation payments it could not make. So, Germany was forced to borrow dollars in order to meet its obligations, but without a trade surplus it remained a credit risk.

Austria was in no better shape.<sup>102</sup> The combined debts of Germany, Austria, Hungary and other Eastern European nations on a short-term floating basis appeared to slightly exceed \$5 billion. This was a figure which was almost equal to the peak in money which had been lent on call within the stock market back in 1929. This figure did not include long-term bond issues, war debts or municipal issues which had been floated and held largely by private investors.<sup>103</sup> In other words, these debts were huge.

The small international investor was attracted to German bonds by the favorable carry, but Germany had big reparations payments so it indirectly sent this money back to the governments of the people it was getting the money from. Germany couldn't service its existing debt, most importantly its reparations, so it borrowed the money to do it. Many of the buyers of German bonds were foreign private citizens who were attracted by the higher interest rates (6% to 7%); the proceeds were paid to the foreign nations who demanded reparation payments. It was essentially a Ponzi scheme that transferred the earnings of the small investor into the hands of the German government through the medium of bonds, which transfers them back to the government that Germany owed it to. Germany wasn't really servicing its debts, but as long as this continued, nobody questioned it. This "Ponzi scheme" approach to servicing debt has, throughout time, commonly existed and, more than any other factor, caused credit problems.

On May 10, 1931, Germany and Austria signed a free trade agreement that was viewed as antagonistic by the French. The Bank of France, accompanied by many other French banks, presented short-term Austrian bills for

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<sup>97</sup> Wigmore p. 236

<sup>98</sup> Armstrong p. 301

<sup>99</sup> Armstrong p. 319

<sup>100</sup> Armstrong p. 341-46

<sup>101</sup> Armstrong p. 339

<sup>102</sup> Armstrong p. 341-46

<sup>103</sup> Armstrong p. 352-3

redemption. This was the final straw which broke the back of the European economic system as repayments were impossible. Britain came to the aid of Austria, advancing 4.5 million pounds. The French responded by selling the pound through the liquidation of their sterling holdings, which caused a liquidity crisis, to get back at Britain.

The liquidity shortage caused bank runs in Austria. On May 13, 1931 riots broke out in front of Austria's Credit-Anstalt bank, which was Austria's largest bank.<sup>104</sup> On May 15, runs were reported throughout Hungary as well. On May 17, 1931 the Credit-Anstalt published its balance sheet and showed sharply reduced capital because of operating losses in almost 250 Austrian companies which it controlled.<sup>105</sup> This triggered a run on its foreign deposits which threatened to exhaust Austria's gold and foreign exchange reserves.<sup>106</sup>

Similar problems plagued Germany. In June Germany's central bank, the Reichsbank, saw its reserves of gold and foreign exchange drop by one-third to the lowest level in five years. In an attempt to attract liquidity at the end of July, the Reichsbank raised its discount rate to 15% and its rate on collateralized loans to 20%. Bank runs continued in Germany so the German government took over the Dresdner Bank, the second largest in the nation. It did this by buying preferred shares, which was the popular way of governments buying interests in banks to help stabilize them. Sound familiar? Germany's reserves continued to decline throughout 1931.<sup>107</sup>

Hoover described the situations as follows: "The nations of Europe have not found peace. Hates and fears dominate their relations. War injuries have permitted no abatement. The multitude of small democracies created by The Treaty of Versailles have developed excessive nationalism. They have created a maze of trade barriers between each other..." The battlefield was forming along the lines of 1) socialism and capitalism within countries and 2) countries against other countries.<sup>108</sup>

Running from Europe, investors' money poured into the U.S., so U.S. interest rates fell. The Fed reduced the discount rate to 1.5% in hopes of making the dollar less attractive to investors. Britain had been losing gold to the United States as scared investors fled Britain and Europe in general.<sup>109</sup> The Central European states raised their interest rates in an attempt to attract foreign capital. This was then followed by foreign exchange controls so investors were not permitted to take money out of the country. This created a drastic side-effect - a halt in international trade.<sup>110</sup> Although no one officially went off the gold standard in May of 1931, since the exportation of capital was prohibited, no gold payments were made. So this had the same result as abandoning the gold standard by the Central European states.

Global tensions worsened. In June of 1931, the European press began to attack the United States. They asserted that the economic policies of the U.S. were attracting the world's gold, creating the flight from European stock markets and foreign exchange markets. U.S. gold reserves had climbed by \$600 million despite the Fed's cut in the discount rate as the flight to safety was too powerful to negate. Despite the deleveraging in the U.S., the U.S. was viewed by world investors as still the safest place at that point, supported by the dollar shortage, debt squeeze in Europe, as well as political concerns there.<sup>111</sup>

As the second quarter of '31 began, hoarding of gold continued to rise including in the US which contributed to reducing the velocity rate of money by 22% from the previous year. Gold became very attractive both in physical form as well as in gold stocks.<sup>112</sup>

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<sup>104</sup> Armstrong p. 341-46

<sup>105</sup> Wigmore p. 294

<sup>106</sup> Wigmore p. 293

<sup>107</sup> Wigmore p. 297

<sup>108</sup> Armstrong p. 381-2

<sup>109</sup> Armstrong p. 342-46

<sup>110</sup> Armstrong p. 346

<sup>111</sup> Armstrong p. 347

<sup>112</sup> Armstrong p. 331

On June 7, the German Finance Minister publicly stated that the Austrian banking crisis would spread to Germany in about 60 days in his opinion, so the panic began immediately. Virtually every German bank suffered runs and foreign banks began to pull credit seeking the immediate redemption of German trade bills and bankers' acceptances.<sup>113</sup>

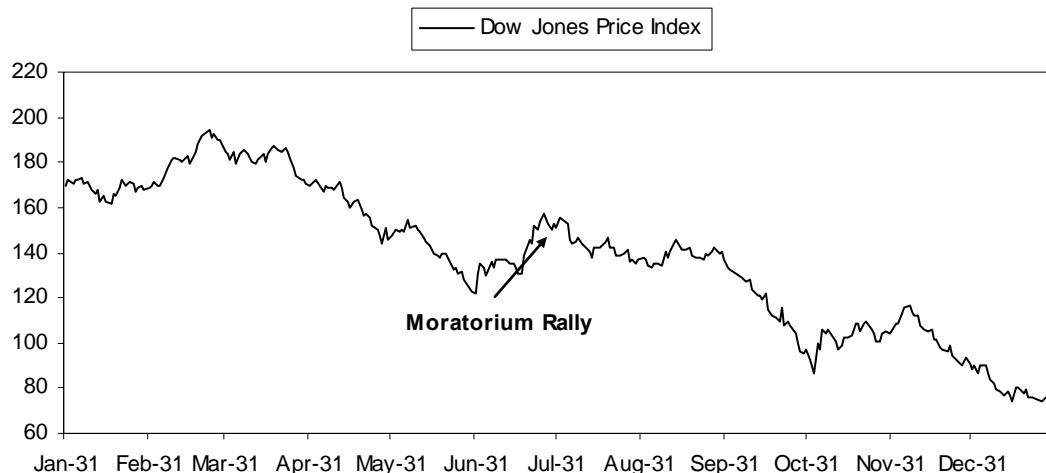
On June 19th, in an attempt to ease Germany's debt problems, President Hoover proposed a one-year moratorium on Germany's war debts, catching most political observers by surprise. The international reaction to the moratorium was favorable. In fact, commentators expected the moratorium was the first step toward restoring international finances, stimulating trade and ending the Depression. Stocks and commodities rose for several days in what became known as the "moratorium rally".<sup>114</sup>

At the time (i.e., in mid-1931), there still was not a sense of crisis to produce stronger actions by the administration, as it was generally assumed the economy would recover and that the moves that occurred were adequate. Financial markets held up reasonably well through June. Governor Harrison of the Federal Reserve Bank of New York thought that the commercial banking system was stronger than ever because of its increased liquidity. No major industries appeared to be in danger of bankruptcy, and the U.S. economy appeared to be moving sideways.<sup>115</sup>

The stock market rose 13% in three weeks in the "moratorium rally" and was up 36% from June 1st at this point.<sup>116</sup> This was the biggest rally since the decline began and commodity prices soared as well, so confidence again returned.

Within a week of Hoover's public announcement of his moratorium proposal, 15 governments had agreed with the plan "unconditionally!" The only important opponent was France who still held bitter resentment toward Germany. So, many people believed that the international debt problem was being managed.

The chart below puts this rally in perspective. It conveys how seeming very big rallies at the time, and the big increases in confidence that accompanied them, were rather small when one steps back to put them in perspective. There was, and still is, a strong tendency for people - workers, investors and policymakers - to exaggerate the importance of relatively small things because they look big up close.



Source: Global Financial Data

<sup>113</sup> Armstrong p. 347

<sup>114</sup> Wigmore p. 295

<sup>115</sup> Wigmore p. 210

<sup>116</sup> Wigmore p. 210

The international debt crisis continued during the moratorium rally. On July 11<sup>th</sup>, only five days after the moratorium was announced, the German government asked the United States to make further loans and to renegotiate reparations, because short-term investments were still being rapidly withdrawn from Germany. At the same time, the German stock exchanges were closed for Monday and Tuesday, and on Monday July 13<sup>th</sup> a nationwide bank holiday was declared in Germany. The German banking system was in chaos. Banks' deposits shrank almost 30% in the year through June 30, 1931 and the unemployment rate soared. The government was threatened from both the left and the right as Communist riots broke out in many cities and Hitler threatened not to make German reparations payments.<sup>117</sup>

National governments were unable to finance their cash requirements in Germany, South America, Sweden, Hungary, Romania, and the United Kingdom, and virtually every South American country, except Argentina, defaulted on its foreign debts. Their bond prices dropped to a range between \$5 and \$25. Eastern Europe did not default during the year, but the prices of East European external debt issues dropped below \$40 in anticipation of the problems ahead. Economic chaos caused political chaos as the battle for wealth between workers and capitalists intensified. Almost every country in South America had a problem with revolution, revolt or war,<sup>118</sup> so investors, both from these countries and from elsewhere, moved their money elsewhere.

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<sup>117</sup> Wigmore p. 296

<sup>118</sup> Wigmore p. 291

## 3Q1931

### The Debt Moratorium and the Run on Sterling...

The euphoric "Moratorium Rally" did not last<sup>119</sup> because the moratorium obviously didn't fix the debt problems. On July 20, 1931, a conference was called in London to discuss the European banking crisis. Hoover's proposal was to call a complete "standstill" among all banks everywhere, preventing anyone from calling upon German or Central European short-term obligations. This didn't bring comfort to investors who had their wealth stored in them. A group of New York bankers complained to the White House and warned that they would not comply with the standstill, which led Hoover to later say, "If [bankers] did not accept within twenty-four hours (his standstill proposal), I would expose their banking conduct to the American people." So the bankers reluctantly backed off.<sup>120</sup>

English banks had lots of loans to Germany so when Germany couldn't pay these banks were in trouble.<sup>121</sup> So naturally, investors wanted to take their money and run, so there was a run on England's reserves. The U.K. banks then, like the U.K. banks now, were in trouble because they owned lots of debt that was in dollars and not being paid back and they were losing cash because depositors and creditors were justifiably scared about what would happen to their money. Then, as now, the Bank of England could only resort to printing money, because credit from elsewhere was not ample. Seeing these problems, on July 24, 1931, the French began sizable withdrawals of gold from London. When the French began to withdraw their gold deposits, other nations followed suit. The Bank of England attempted to stem the run by implementing the typical textbook action of raising interest rates. Of course this didn't work.

Then, on August 1, 1931, the Bank of England asked the U.S. government for a loan from private U.S. banks. Hoover encouraged this action to be taken immediately. But the selling pressure against the pound through the withdrawals of gold by governments and the selling of the pound by private investors forced the Bank of England to request an even bigger loan on August 26. Both loans were made, but even this was far from enough to stem the tide.<sup>122</sup> The bank rate was raised from 3 ½% to 4 ½% on July 29.<sup>123</sup> Another big loan from US and French bankers was made on August 28. Note that, through history, the U.K. has always been a preferred country in getting U.S. loans.

But these loans didn't stop investors' run out of sterling. In fact, they essentially helped to fund them by providing the loans. During July the Bank of England lost nearly one-third of its gold reserves. The Bank of France supported sterling throughout the week of September 7-12 but Dutch banks began to call their funds heavily from London to meet their domestic cash needs, as they were being squeezed also.

On September 19 sterling dropped sharply and banks refused to book any speculative short sales of sterling. The London Stock Exchange was in panic.<sup>124</sup> Finally, on Sunday, September 20, 1931, the Bank of England abandoned the gold standard and effectively defaulted on its foreign obligations. U.K. bonds plunged.<sup>125</sup>

Sterling fell 31% over next 3 months. On Monday, the first day of trading after the suspension of gold payments, sterling dropped to a low of \$3.71 from the Friday's level of \$4.86. Then, sterling exchange rates fluctuated widely, from as high as \$4.20 to as low as \$3.50 during September. As with the earlier described stock market action, there were plenty of false rallies with bullish sounding developments which easily could have led people to overlook the big move. Sterling averaged \$3.89 in October, \$3.72 in November and \$3.37 in December.

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<sup>119</sup> Armstrong p. 351

<sup>120</sup> Armstrong p. 354-5

<sup>121</sup> Wigmore p. 298

<sup>122</sup> Armstrong p. 355-6

<sup>123</sup> Wigmore p. 299

<sup>124</sup> Wigmore p. 301

<sup>125</sup> Armstrong p. 359

The Scandinavian countries devalued by a percentage similar to that of the United Kingdom (31%) as did Portugal, New Zealand, Egypt, and India. Australia devalued by over 40%, Canada by only 17%.

Every foreign bond hit a new low for the period in 1931, and every issue but those for Switzerland and France declined 20% or more from its 1931 high price, as investors ran from government bonds fearing that they would either be paid back with devalued paper money or be defaulted on. Bonds of Germany, Austria, and the rest of Eastern Europe, with the exception of Czechoslovakia, sold off drastically. Austria's bonds dropped to \$35, Germany's to \$22, Poland's to \$32, Berlin's to \$14 and Yugoslavia's to \$29.<sup>126</sup>

However, England's credit was not seriously hurt by the event, though the bond initially sold off. That is because the devaluation made it easy for the U.K. to pay off U.K. bonds with the pounds the Bank of England could produce. So on these bonds there was no default risk or a shortage of demand, so the only risk was inflation risk, but that wasn't a problem because the devaluation did little more than negate deflation. United Kingdom 5 ½% bonds due in 1937 dropped to \$92 immediately after the devaluation, having been \$104 a week prior, but \$90 was the low price for 1931 and the bonds were back over \$100 by year end. England had been so hampered by an overvalued currency that the devaluation acted like a tonic. Stocks in the next few months rose up 30%, and by the end of October the Bank of England repaid \$100 million of its foreign debts as money flowed back into London banks. This is a classic example of how devaluations in deflationary environments create debt relief and negate deflation rather than rekindle inflation.<sup>127</sup> Of course, 30% less in sterling is still 30% so investors anticipating devaluations want to get into something stable like gold.

### Problems Spread to the U.S.

The devaluation of sterling in 1931 sent shock waves through U.S. securities markets that pushed stock prices to new lows. Some other countries' stock markets simply stopped trading. For example, the Berlin Bourse closed from July 13 to September 3, opened with short selling banned, then closed again. In Amsterdam on September 21, after a sharp decline in prices, all transactions were cancelled and the Exchange closed.<sup>128</sup> The New York Stock Exchange remained open, but as in dark November 1929, short selling was forbidden and investors worried, so risk premiums increased.

The Dow Jones Industrials dropped more sharply than ever before, except for its collapse into November 1929. The industrials fell below the 100 level and closed September on the low of the month.<sup>129</sup> The Dow declined a further 38% between September 1<sup>st</sup> and October 5<sup>th</sup>.<sup>130</sup> As October began, the havoc continued, forcing the industrials down to 86, nearly half the price at the peak of the "moratorium rally" during June 1931. Undoubtedly a good deal of the fear was of confiscation risk as well as price risk.

The sharp decline in stock prices during September of 1931 was also accompanied by a sharp decline in production within many industries. Auto production during September fell 25.6% from August levels.<sup>131</sup> Commodities prices declined all year. Investors just wanted safety and that pulled cash and credit out of the hands of consumers and workers.

Banks needed to sell bonds to raise cash, which contributed to rising yields. Yields on long-term U.S. Treasury bonds rose from 3 ¼% to 4% in the fourth quarter of 1931. Also, there were concerns about U.S. Treasury's ability to roll bonds coming due over the next two years as a result of its World War I Liberty Bond financing

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<sup>126</sup> Wigmore p. 302

<sup>127</sup> Wigmore p. 303

<sup>128</sup> Wigmore p. 291

<sup>129</sup> Armstrong p. 362

<sup>130</sup> Wigmore p. 236

<sup>131</sup> Armstrong p. 236

maturing.<sup>132</sup> There was a \$2 billion budget deficit to finance, plus \$10 billion in U.S. maturities in 1932–1933. The U.S. was beginning to look like the U.K. before its devaluation.<sup>133</sup>

After the sterling crisis there were no further refundings in 1931 because of the weakness of the market. The U.S. Treasury 4 ¼% bonds due in 1952 dropped from over \$114 in June to as low as \$102 in October, rose back to \$108 in November and fell down again to \$100 in December – all of which was too much volatility for successful underwriting.<sup>134</sup>

Despite the fact that the Supreme Court had upheld the legality of shortselling back in 1905, the growing sentiment was clearly seeking a scapegoat, and stock market bears and Wall Street tycoons became the targets. They were widely blamed for causing the numerous bank failures and governmental defaults.<sup>135</sup> As law suits mounted and people fought over losses – sometimes in the courts and sometimes in the streets – the Dow Jones Industrials fell severely as capitalists got scared and sought safety.<sup>136</sup>

## 4Q1931

### International Crisis Shakes Domestic Markets

The decline in business conditions accelerated sharply after the international crisis as those who controlled businesses were the capitalists and capital preservation was their primary objective. Bank failures were at record levels in the last quarter of 1931, and many industries, particularly railroads, began to suffer severe losses. The Gross National Product dropped 7.7% in constant dollars. Unemployment approached 25% by the end of the year.<sup>137</sup> While National Income had declined by 31% in current dollars from the peak, the income of all businesses fell 65%. Corporate profits had declined from 10% of National Income to a loss equal to a negative 1 ½% of National Income.<sup>138</sup>

At the time, hardly anyone believed that more and cheaper credit availability would have stimulated business, because even with interest rates of zero, the real cost of more borrowing was very high and the industries which needed credit weren't good credits.<sup>139</sup> It was unimaginable then, and comparably implausible to us now, that banks and other investors will lend to unsound borrowers in a deflation.

In September 1931, the dollar ceased to be a safe haven. Since other countries defaulted and devalued, their needs for dollars fell and the United States' budget and credit problems started to raise concerns<sup>140</sup> that the U.S. would have to choose between default and devaluation. So, after the sterling crisis and the U.S. banking crisis worsened, gold reserves fell, the economy fell, and there was a run on banks.<sup>141</sup> U.S. gold reserves increased right up to the week ending Saturday, September 19, 1931—the day before the United Kingdom decided to suspend gold payments. The U.S. gold outflow began on the following Monday, when foreign banks, including the Bank of France, bought almost \$100 million in gold from the Federal Reserve. Within three weeks of the suspension of sterling, the United States lost approximately 10% of its reserves.<sup>142</sup> The Fed raised the discount rate substantially, hoping that higher interest rates would attract investors back.<sup>143</sup>

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<sup>132</sup> Wigmore p. 289

<sup>133</sup> Wigmore p. 226

<sup>134</sup> Wigmore p. 289

<sup>135</sup> Armstrong p. 366

<sup>136</sup> Armstrong p. 321

<sup>137</sup> Wigmore p. 209

<sup>138</sup> Wigmore p. 229-30

<sup>139</sup> Wigmore p. 227

<sup>140</sup> Armstrong p. 373

<sup>141</sup> Wigmore p. 214

<sup>142</sup> Wigmore p. 215

<sup>143</sup> Armstrong p. 373

To counter the gold outflow, the New York Federal Reserve Bank raised its discount rate from 1 ½% to 2 1/2% on October 8<sup>th</sup>, but foreign investors' concerns had reached the point of not being affected by changes in interest rates. Rumors abroad that the United States would go off the gold standard as the U.K. did prompted a record one-day gold outflow on October 14<sup>th</sup>. The New York Federal Reserve Bank discount rate was raised another 1% to 3 ½% the next day. The next week, France agreed not to withdraw any more gold from the United States, and both countries agreed to consult each other before advancing any new proposals for extending the war debts moratorium.<sup>144</sup>

However, the supply-demand imbalance for dollars continued to worsen as the Federal government's deficit became too big to fund in September 1931, so the Federal Reserve bought U.S. long bonds.<sup>145</sup>

In mid-October Canada prohibited the exportation of gold , causing investors who tried to protect themselves by hiding in gold to be trapped.

Besides foreigners withholding gold,<sup>146</sup> there was domestic hoarding of gold and currency by U.S. individuals.<sup>147</sup> There was a sharp contraction in bank deposits generally during the last quarter of 1931 as foreigners pulled out and individuals shifted bank deposits into gold and cash hoarding.<sup>148</sup> Reflecting this, currency in circulation, including gold and silver, jumped by about 20% from June 1931 to December.<sup>149</sup>

The Fed's tightening to keep capital produced a cash shortage that caused loans to be called. Bankers began to call in loans from many sectors, trying to increase their cash reserves. Many homes and farms were forced into foreclosure because their loans weren't renewed. Company bankruptcies were increased as creditors called in all the loans to debtors. The contraction in the money supply was not caused by the Federal Reserve intentionally, but because of the behavior seeking safety via the withdrawal of foreign capital, domestic hoarding, and the foreclosure on property which further depressed the values of tangible assets.<sup>150</sup>

The Federal Reserve was given authority to buy U.S. T-bonds in April 1932 so it bought them as deficits increased and foreign investors withdrew funds. Because of the balance of payments imbalance being financed through the Fed's liquidity creation, a currency crisis developed.<sup>151</sup>

The chart below shows Fed purchases and holdings of government securities from January 1931 to December 1932. As shown, the balance sheet was significantly expanded by this process.

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<sup>144</sup> Wigmore 216-17

<sup>145</sup> Wigmore 216-17

<sup>146</sup> Armstrong p. 374

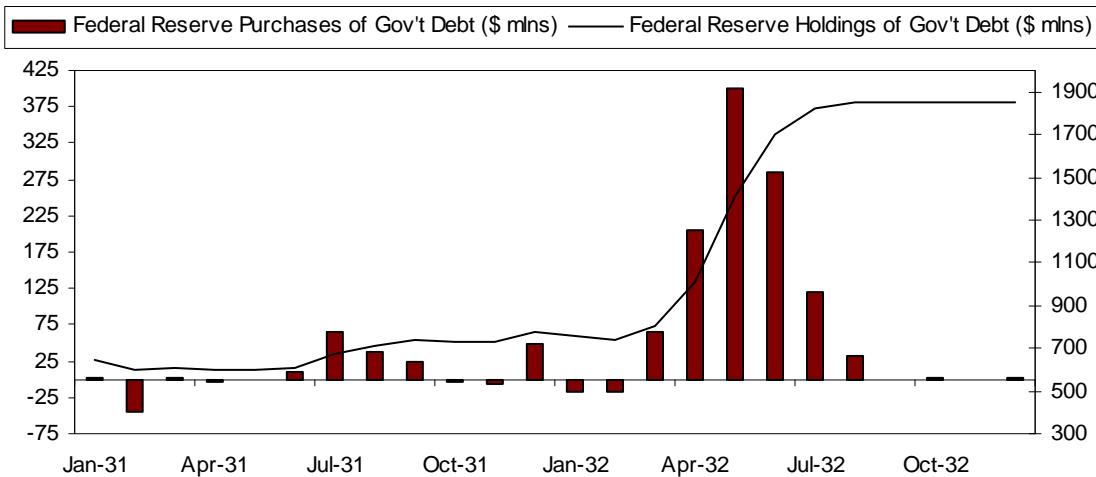
<sup>147</sup> Armstrong p. 374

<sup>148</sup> Wigmore p. 218

<sup>149</sup> Wigmore p. 219-220

<sup>150</sup> Armstrong p. 375

<sup>151</sup> Wigmore p. 216-17



Through the 1920s and up until 1933, the money supply was essentially linked to the supply of gold and, through the multiplier effect, the supply of money created the supply of credit and that credit growth funded economic growth. In the 1920s,<sup>152</sup> \$1 in gold led to \$13 in debt as money was lent and relent to create an amount of debt that was many times the supply of money. Of course, debt is the promise to deliver money, so when this ratio became high, the system became precariously balanced. When credit starts to fall, usually because there is not enough money to meet debt obligations, credit falls and the demand for money increases, so the ratio falls.

When the supply of money is linked to the supply of gold, debt must contract more and economic activity must also fall more than if the supply of money can be increased. When investors lose confidence in a bank or the government and they hoard their assets (e.g., in cash and gold), as was the case during the Depression, the hoarding reduces the availability of credit. Since the Fed could not create gold, its only option was to create paper money. It was then believed that central banks could not create much paper money while on a gold standard because such a move would revive Gresham's law of bad money driving out the good.<sup>153</sup> If investors wanted to cash in their US bonds, notes and bills at the same time, the government would be forced to choose between not increasing the money supply, which would lead to interest rates rising, or printing money. That is because not enough cash as measured through M1 exists to cover all the debt obligations. Of course, as long as investors feel comfortable with bonds as a "store of wealth," and don't need the cash, everything is fine. But when confidence in bonds is lost and/or cash is needed, investors run in the direction of cash and gold. There is simply not enough cash to go around, especially as gold is taken out of reserves, and a massive contraction takes place. When nations began to default on their bonds and the need of the federal governments to borrow more than investors would lend, confidence in bonds and government debt maintaining their value gave way, driving investors into gold and cash for safety. Because debt multiplies the value of these tangible assets, it creates a bubble which eventually comes to a head creating a stampede into cash. This has been true through history, all the way back to Roman times and before.<sup>154</sup>

During August, runs for cash closed most of the banks in Toledo and Omaha and banks in L.A., New York and Brooklyn. Bank failures accelerated in July and August.<sup>155</sup> In the Depression, the bank failures were primarily due to the declines in corporate bond, stock, real estate, and commodities values, as well as declines in business generally, which destroyed asset values and income. The weakness of the economy became apparent only in the summer months, as real estate foreclosures accelerated, wage and salary cuts were initiated in major industries, and domestic and international trade fell off sharply. Then, as now, real estate was one of the weakest areas of the economy. Real estate values had collapsed earlier in some regions, particularly in Florida and South Carolina.

<sup>152</sup> Armstrong p. 370

<sup>153</sup> Armstrong p. 370

<sup>154</sup> Armstrong p. 371

<sup>155</sup> Wigmore p. 218

This problem spread to New York where there were foreclosures on commercial properties and rental buildings by savings banks and life insurance companies which produced a rash of foreclosure auctions beginning in June 1931.<sup>156</sup> Then, as now, the collapse of real estate values generated increased uneasiness towards the banks. The bubble in real estate was reflected in real estate loans by national banks doubling from 5% of loans in 1928 to 10% in 1930.<sup>157</sup>

Because illiquid assets could not be sold to raise liquidity, President Hoover wanted to allow the Federal Reserve to accept illiquid collateral to lend against.<sup>158</sup>

On December 10, 1931, Chase securities announced write-downs of \$120 million to account for losses in securities still carried at pre-Crash values. Similar credit problems were pervasive. Banks' net profits were reduced from over \$556 million in 1929 to \$306 million in 1930 to virtually zero in 1931. Securities losses at banks were a record \$264 million in 1931 compared with \$109 million in 1930 and \$95 million in 1929. Loan losses were a record \$295 million compared with \$195 million in 1930 and \$140 million in 1929. Interest earned on loans, bills and commercial paper dropped from \$1.6 billion in 1929 to \$1.3 billion in 1930 and \$1.1 billion 1931. Then, as now, the banks were squeezed from every direction.<sup>159</sup>

All sorts of moves were made to hide the real values of assets of banks. Such attempts to hide losses in deleveragings are typical. For example, laws were changed to preserve the fiction of profits, a moratorium was declared on removing railroad bonds from the legal investment list in New York State, so that banks did not have to realize losses on the sale of bonds taken off the "legal list", and federal authorities allowed banks to carry at par all U.S. bonds and other bonds within the four highest credit ratings (Baa to Aaa).<sup>160</sup>

### **Hoover's "Super Plan"**

Then, as now, the administration started to exert pressure on the banks to lend. Hoover's "Super Plan" to do this created what was known as the National Credit Corporation. Hoover realized that vast sums of assets were frozen and that, combined with international investors' capital withdrawals, this spelled potential international disaster, so his idea was to create another form of central bank in a sense. The National Credit Corporation would be a private organization funded by \$500 million in deposit contributions from the banks themselves. In turn, these funds would be used to bail out banks with cash flow problems by lending them cash against good collateral held on their books. He believed that this was essential to bring a halt to the bank failures and the foreclosures which further increased fears among the people and led to domestic hoarding of gold.

Hoover's plan began to gel prior to the British default of September 21, 1931. At a confidential meeting during early September, Hoover called to the White House the entire Advisor Council of the Federal Reserve Board members, which consisted of 24 bankers and Treasury officials, and proposed that the banks pool together \$500 million for the creation of this new project. In addition, he proposed that this new pool be given borrowing powers of \$1 billion, thus allowing them to buy a substantial amount of illiquid assets to take them off banks' balance sheets.

Then the British default took place. Suddenly the gold reserves of the U.S. fell. Eleven days later, Hoover called a special meeting of the leading men from the banks, insurance and loan agencies along with several top government officials. Hoover wanted to avoid publicity on this meeting, so the meeting took place on October 4, at the home of Andrew Mellon rather than at the White House.<sup>161</sup> Hoover later wrote that many attending the meeting held at Mellon's house did not want to contribute funds to this central pool and urged that the

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<sup>156</sup> Wigmore p. 228

<sup>157</sup> Wigmore p. 220

<sup>158</sup> Wigmore p. 224

<sup>159</sup> Wigmore p. 221

<sup>160</sup> Wigmore p. 221

<sup>161</sup> Armstrong p. 375

government should put up the money. But Hoover was strongly against using taxpayer's money, so the meeting ended with the bankers agreeing to call a meeting of all major New York banks for the following day.

Hoover had also proposed that banks and insurance companies hold back on foreclosures and that a central system of discounting mortgages should be established. Again, the concept was a central bank which would accept mortgages in the same manner as the Fed accepts cash or liquid notes. Basically this is what the Fed is doing now. The savings and loan group agreed with Hoover's proposals which called for an immediate end to foreclosures upon responsible people. The insurance industry refused to go along with the proposed banking structure which would have 12 districts and accept mortgages as deposits.

Hoover then met with Congressional leaders at the White House on October 6. He found them unwilling to use tax payer money to fund any government structure to provide stability for the real estate situation.<sup>162</sup> Hoover then created the Home Loan Banks which stood in the middle of the savings and loans. He also created the National Credit Corporation, which further helped confidence in banks.

News of these new plans restored confidence both domestically and internationally. But at first, the Europeans misunderstood these proposals and assumed they would be funded by government, which they felt meant inflation and a decline in U.S. gold reserves. Therefore, initially, this news added some pressure to the dollar coming from Europe. Eventually, they understood the plan and fears that the United States would go into default on its commitment to deliver gold began to subside along with the gold withdrawals going into year end. The concept of this new form of centralized private banking to unlock frozen capital and to help prevent further banking failures was well received by the markets as well.<sup>163</sup> The low in the U.S. gold reserves had been reached during the final week in October and it rose steadily throughout November. Stocks also rallied. Everyone became bullish and even the famous investor Roger Babson, who called the stock market's top in 1929, ran a small ad with its headline "Is Bear Market Over?"<sup>164</sup>

The Dow rose 35% from early October to early November. Most of the rebound was concentrated in the week of October 5<sup>th</sup>-10<sup>th</sup>, during which President Hoover announced his proposals for a National Credit Corporation and various other provisions to ease the banking crisis. But, like other failed rallies on bullish announcements, this rally failed when the proposals proved too small for the problem.<sup>165</sup> Stocks declined sharply, taking the Dow down to a new low of 74 in late December. That brought the leading stock averages down to only one-third of their 1931 highs and one-sixth of their 1929 highs. The only important nations which remained on the gold standard were the US and France.

## 1H1932

In spite of the National Credit Corporation, bank failures were still hitting the papers almost daily. The Reconstruction Finance Corporation (RFC), which was the TARP program of the time, was proposed to Congress by President Hoover in December 1931 and signed into law on January 23, 1932,<sup>166</sup> with authority to spend \$1.5 billion. Largely as a result of all this support for banks and others, the Dow rallied from that December 1931 low of 73 to nearly 86 in early January which was about a 19% gain, but finished January back down at the 76 level.<sup>167</sup>

The tensions between workers and capitalists intensified in 1932. In 1932 there were demonstrations in Washington and politicians turned their sights on the investment community as a whole. Some politicians accused the banks of intentionally trying to destroy the economy of the world in an effort to force the United States to cancel the outstanding war debts of Europe so that normal commercial debts could be settled with the

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<sup>162</sup> Armstrong p. 376

<sup>163</sup> Armstrong p. 376

<sup>164</sup> Armstrong p. 378

<sup>165</sup> Wigmore p. 237

<sup>166</sup> Wigmore p. 311

<sup>167</sup> Armstrong p. 395

banks. Some politicians supported the total abolition of the stock market while others urged that the shorts could be exposed and jailed as if their actions rose to the level of treason.<sup>168</sup> The proletariat and politicians turned on capitalists and investors.

The fiscal 1932 budget deficit grew because revenues were cut in half between fiscal 1929 and fiscal 1932, while federal budget expenditures grew by half. Believing that a budget deficit could lead the U.S. to default, the administration began to push for tax increases and expenditure cuts.<sup>169</sup> Everyone wanted a balanced budget back then. Business support for a balanced budget was almost universal. The American Bankers Association and the Investment Bankers Association predictably passed resolution at their conventions early in the year favoring higher taxes and lower expenditures to balance the budget. Political support for a balanced budget was broadly bipartisan.<sup>170</sup>

In January 1932, the Comptroller of the Currency abandoned mark to market accounting for banks. Bank examiners were instructed to use par value as the "intrinsic value" of bonds rated Baa or better held by national banks.<sup>171</sup> The Comptroller of the Currency also issued a demand to all national banks that they report on what bonds they were holding. Even good bonds had been devastated so banks either faced huger paper losses on what they held, or suffered actual cash losses if they sold.<sup>172</sup>

Optimism returned in mid-February when the RFC began to make loans to banks and railroads and when Congress passed an amendment to the Federal Reserve statute permitting the Federal Reserve banks to hold US government bonds, as well as gold, as cover for Federal Reserve obligations so the Federal Reserve System was freed to pursue an aggressive open market policy of purchasing government securities without being constrained by the loss of gold to foreigners expected to follow such an "inflationary" policy. So, the Dow Jones Industrial Index jumped by 19.5%.<sup>173</sup> The stock market immediately rallied back to the January high and managed to close above the 80 level.

On February 11, Hoover managed to obtain cooperation from all parties to usher through the Glass-Steagall bill, which broadened the scope of debt that was eligible for rediscounting at the Federal Reserve. Broadening the scope of collateral that can be discounted at the central bank is a classic step in the D-process. This was perceived as bullish as it was felt that this would help many banks to unfreeze assets that were previously unacceptable as collateral at the Fed. The bill was signed by Hoover on February 27.<sup>174</sup>

At the time, the Senate Finance Committee conducted hearings into international banking and war debts. It sought a complete list of all foreign bond issues which were currently in default. That information was obtained from the Institute of International Finance. The Senate made that list public in January 1932. The list totaled \$815 million worth of foreign bonds denominated in dollars with defaults covering 57 issues, with all being obligations of South American governments. The majority of the junk bonds were held by small investors who had been lured into buying them by numerous advertising campaigns which touted bonds as the "safe" investment and offered high yields.<sup>175</sup>

Investor fears intensified, so in Europe and the U.S., the hoarding of U.S. \$20 gold coins increased, with the premium rising to 50% - i.e., the price rose to as much as \$30.

Japanese bonds and the yen had collapsed. Japan had abandoned the gold standard a few months before, so the yen fell from the par level of 49.84 cents to 35 cents. As a result, Japanese bonds denominated in dollars

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<sup>168</sup> Armstrong p. 388

<sup>169</sup> Wigmore p. 308

<sup>170</sup> Wigmore p. 309

<sup>171</sup> Wigmore p. 312

<sup>172</sup> Armstrong p. 392

<sup>173</sup> Wigmore p. 331

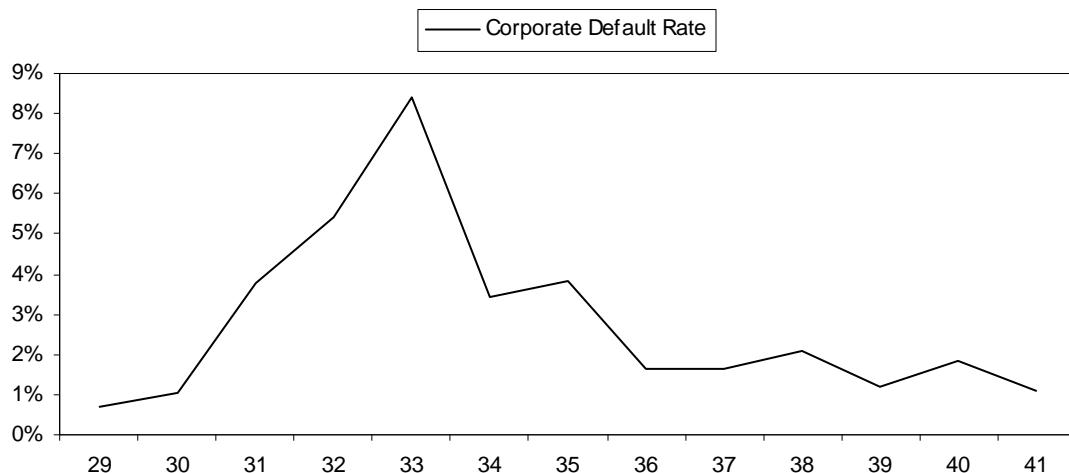
<sup>174</sup> Armstrong p. 395

<sup>175</sup> Armstrong p. 391-2

collapsed from 100 to 61. The total U.S. investment in Japan was reported to be \$450 million, of which \$390 million was Japanese bonds. But Japan's gold reserves had dropped to only \$190 million which represented half of the outstanding debt to the United States alone, so it wasn't difficult to figure out that Japan would default on its obligations to pay its debts in gold.

Throughout history the French have always been among the first to hoard gold in a crisis and the French government was always the first to ask for gold during a monetary breakdown - e.g., in 1968 when DeGaulle asked for gold instead of dollars from the U.S., etc. The French people are the same, so they caused the French government problems by asking the French government for gold. To avoid demand from the French public, the French government stated that it would only make gold payments in \$8,000 lot minimums. As a result, gold coins were in very high demand. In the United States, many contracts began to be issued in terms which required payment in gold coin. While gold was rising in street value, other commodities continued to decline.

That reflected decreasing confidence in holding debt, including government debt, during a deleveraging when the demand for commodities is weak.<sup>176</sup>



In February, the business failures were the highest on record for any month.<sup>177</sup>

In March, the stock market sold off again as expectations that the Fed's move to reliquify were disappointed. The market decline began in March and extended for 11 weeks until the Dow had dropped from 88 on March 8<sup>th</sup> to 44 on May 31<sup>st</sup>, a decline of 50%. This stock market decline occurred while the Federal Reserve was following an unprecedented open market policy of expanding its holdings of U.S. government securities from \$740 million at the end of February 1932 to \$1.8 billion at the end of July.<sup>178</sup>

The British pound, which had fallen from the par value of April 1931 before the devaluation, began to fall again, dropping to \$3.65 from its March high of \$3.77. The downtrend would eventually continue into November of 1932 when the pound dropped to \$3.15. Only the French and the Swiss currencies remained steady.<sup>179</sup>

Trading volume on the NYSE during April had declined to 31.4 million shares. This was the first panic sell off where new lows were achieved on lower volume. The Dow Jones Industrials fell almost continuously straight down, closing May on the low for the month. Yet volume declined considerably. The lower volume reflected

<sup>176</sup> Armstrong p. 396-9

<sup>177</sup> Armstrong p. 396-9

<sup>178</sup> Wigmore p. 331

<sup>179</sup> Armstrong p. 404

lower investor participation as they had essentially given up on it. Big sell-offs on low volume late in a bear market are a good sign of exhaustion. On a percentage basis, the market decline was about equal to the panic of 1907 and that of the panic of 1920.<sup>180</sup>

Hoover tried to but couldn't get credit going. Hoover and Treasury Secretary Mills regularly blamed the banks for restricting loans and condemned both the public and the banks for hoarding.<sup>181</sup> Hoover tried to get the banks to lend, but couldn't. For example, Hoover organized committees of prominent citizens in all Federal Reserve districts to try to encourage the larger regional banks to make loans.<sup>182</sup> During May 1932, Hoover requested a doubling in the RFC authorization to \$3 billion, of which \$300 million was earmarked for aid to local governments.<sup>183</sup> But nothing was adequate.

Back then, the Fed didn't handle failed banks, so they were turned over to the RFC. The government didn't have the administrative resources to handle all of these problems.<sup>184</sup>

Like TARP, the RFC lent to financial institutions. In fact, the relationship with the Bank of America then and the Bank of America now is basically the same. In 1932, the Reconstruction Finance Corporation prevented bank closings from being more numerous by lending \$1.3 billion by the end of August 1932 to 5,520 financial institutions, which included its first loan to the Bank of America for \$15 million, which it ultimately expanded to \$64.5 million, and the Federal Reserve continued to buy U.S. Treasury bonds. The Federal Reserve System's holdings of U.S. government securities expanded from \$870 million on March 31, 1932, to \$1784 million by June 30.<sup>185</sup>

Then, like now, the RFC (the TARP equivalent) and the Fed made loans directly to borrowers who couldn't roll debt, while letting others default. They felt compelled to do this because the banks were unwilling to lend even to borrowers facing bond maturities. The intense desire for liquidity created such competition for short-term government securities that Treasury bill yields were negative in much of October, November and December.<sup>186</sup>

The decline in short-term interest rates was also driven by aggressive Fed buying of T-bills. Between April and August 1932, the Federal Reserve instituted an unprecedented open-market purchase program in an effort to create bank liquidity. This helped. The 11 months following January had fewer suspensions than either 1930 or 1931. Federal Reserve borrowing was relatively low for banks in major cities during 1932, and these banks' investments were stable, which also gave the impression that the emergency in banking conditions had passed. The effect on money market rates was dramatic. 3-to-6-month Treasury securities yields dropped 180 basis points from 2.25% to 0.30% in eight weeks once the Federal Reserve began its purchases.<sup>187</sup>

Interestingly, the market reactions to government moves began to change. While previously government programs to increase lending and spending were viewed by the market optimistically, in mid-1932 they did not produce optimism.<sup>188</sup> It was then apparent that Hoover had established many programs to stimulate lending, spending and job creation, but they did not have the desired effect, yet they cost a lot of money. In fact, some government attempts to help banks hurt them. For example, the RFC lending to some banks saved them from bankruptcy, but the banks gave all their good assets to the RFC as collateral. A J.P. Morgan & Co. partner described this dynamic as follows: "For a fatal year and a half the RFC continued to lend money to the banks on adequate collateral security and gradually bankrupted them in the effort to save them." The RFC made large loans to banks on the collateral of real estate loans and securities that many considered to be of questionable value, but the RFC still had to make these loans based on some estimate of the fair market value of the collateral and with some margin of surplus collateral. These collateral values were well below the banks' book values in the

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<sup>180</sup> Armstrong p. 404

<sup>181</sup> Wigmore p. 313

<sup>182</sup> Wigmore p. 326

<sup>183</sup> Wigmore p. 312

<sup>184</sup> Wigmore p. 323

<sup>185</sup> Wigmore p. 318

<sup>186</sup> Wigmore p. 326

<sup>187</sup> Wigmore p. 318

<sup>188</sup> Armstrong p.419

securities. As a result, the borrowing banks found they had pledged all but their worst assets to the Federal Reserve and to the RFC at a discount from the par values and could only get back a portion of their deposits.

Many banks would have had their net worth effectively wiped out if all their assets, securities, and loans had to be written down to the low values of mid-1932. This is essentially what happened when the RFC calculated how much it could lend a bank. This failure to make the banks healthy became apparent, so banks' deposits dropped further than could be borrowed from the RFC after it had sold its highly liquid securities, so the bank had no more good assets on which to borrow elsewhere.<sup>189</sup>

Borrowing from the RFC also signified a bank was in need, which led to withdrawals. There was a vicious circle in progress for the banks which borrowed from the RFC. Directors, officers, other banks, and often major customers were aware of a borrowing bank's problems, and this information circulated in the business community and naturally caused large depositors to be cautious about the size of deposits they left with the bank, so they pulled them.<sup>190</sup> So, if word got out that a bank was borrowing from the RFC its condition was immediately suspect and runs on its deposits began.<sup>191</sup>

Because the banks wanted to hoard cash to keep safe and because they didn't want to lend to borrowers who weren't creditworthy, the banks did not want to roll over many maturing debts. Railroads were in trouble of their large revenue and income losses, so they were unable to pay the \$300-\$400 million in bond maturities that came due in 1932.<sup>192</sup> But the government wanted the banks to rollover these debts, so the government via the RFC and the ICC mandated that railroad bonds (heavily owned by the banking system) maturing in 1932 should not be paid off in cash lent by the RFC, but rather should be settled by a combination of cash and refunding bonds which lenders had no choice but to accept.<sup>193</sup> Needless to say, this further undermined the confidence of investors in their abilities to get cash from their investments and in the legal system protecting their rights.

In March 1932 suspicion led the U.S. Senate to authorize an investigation into securities practices which ultimately led to the massive legal and structural changes in the securities industry embodied in the Securities Act of 1933, the Securities and Exchange Act of 1934, and the Glass-Steagall Act of 1933.<sup>194</sup> The government investigation of stock manipulation was like a witch hunt.<sup>195</sup> Understandably there was a lot of congressional digging that turned up abuses. However, this went beyond reasonable.

Congress had problems making decisions as conflicting factions argued endlessly. For example, the fiscal 1933 budget was debated in Congress from March through June while Hoover gave little guidance on the budget cuts necessary, trying to place the onus for them on Congress in this election year. Foreign investor reaction to both the anti-investor mood and the indecision in government was negative and contributed to capital flight, which was clearly expressed in U.S. gold losses throughout the period.<sup>196</sup>

The Federal Government had a big budget deficit and the pending tax bill seemed to be going nowhere. Meanwhile, spending increased as Hoover sought to create jobs for the unemployed. The billions of dollars being spent in recovery attempts without any plan for paying for them scared European investors, so gold outflows began to increase.<sup>197</sup>

Back then it was a popular technique of the government to package spending as loans – i.e., to create “loans” to entities which spent which allowed the government to keep the loans on its books as assets. For example, if the

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<sup>189</sup> Armstrong p. 420

<sup>190</sup> Wigmore p. 325

<sup>191</sup> Wigmore p. 312

<sup>192</sup> Wigmore p. 396

<sup>193</sup> Wigmore p. 318

<sup>194</sup> Wigmore p. 336

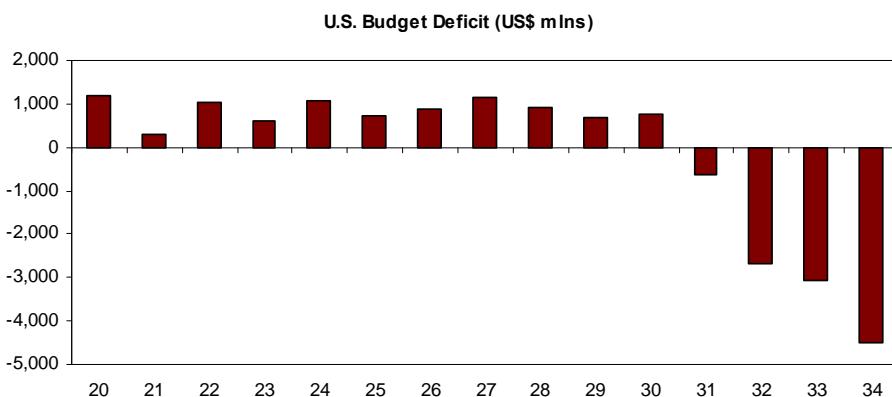
<sup>195</sup> Armstrong 412-3

<sup>196</sup> Wigmore p. 314

<sup>197</sup> Armstrong p. 411

government made a loan to a bank, it could treat that as an exchange of one asset for another rather than an expense. This technique made the budget deficit look smaller than if the same money was provided as assistance. So, the government promoted loan programs outside the budget, particularly for the RFC. Of course, the impact of these loan programs on government financing requirements was no different than if the programs were government spending,<sup>198</sup> so the supply demand imbalance for government credit remained.

At this time there was a move to redistribute wealth. Although governments would stop short of full blown communism, laws progressively were intended to redistribute wealth. For example, the gradated income tax rate eventually rose to 90%<sup>199</sup> and the budget deficit ballooned (see below).<sup>200</sup>



In Europe, concerns about the deficit and the inhospitable environment in the United States sparked heavy withdrawals of gold by European investors. Within the first ten days in June, \$152 million in gold bullion had been withdrawn. On June 6, 1932, President Hoover signed into law the new Revenue Act, which increased income taxes and corporation taxes along with a variety of excise taxes. On June 14, 1932, France withdrew her last gold which was held on deposit at the NY Federal Reserve.<sup>201</sup>

The Federal Reserve publicly reassured the public that it intended to continue buying U.S. governments in order to fund the deficit and hold interest rates down. Of course, this was incompatible with the stable exchange rate policy. So, despite these assurances, purchases of bonds finally came to a halt in August, after which the Federal Reserve holdings of U.S. securities remained very stable at \$1,850 million. That year net new U.S. borrowing in 1932 exceeded \$3 billion, the federal budget deficit exceeded \$2.5 billion, and the deficit was over one-half of federal expenditures.

On June 16 in Switzerland, a group of seven nations met and finally agreed at Lausanne to reduce the German reparations payments from \$64 billion to less than \$1 billion.

## 2H1932

The economy continued to plunge with deflation. Broad measures of the economy in 1932 had dropped to about 50% of their 1929 levels in current dollar terms, though if expressed in constant dollars the decline was approximately 28% from 1929. There were a record 31,822 bankruptcies, with liabilities of \$928 million. Though these were painful, they reduced debt service obligations, thus helping to fix the debt service imbalance. Industry as a whole had an after-tax loss of \$2.7 billion in 1932, compared with its peak profits of \$8.6 billion in 1929, forcing drastic cost-cutting, reducing their breakeven levels.<sup>202</sup> Through this painful process, those businesses that survived became leaner and meaner.

<sup>198</sup> Wigmore p. 313

<sup>199</sup> Armstrong p. 415

<sup>200</sup> Armstrong p. 420

<sup>201</sup> Armstrong p. 421

<sup>202</sup> Wigmore p. 315

At the same time, workers became militant, which scared investors. Unemployment averaged 36.3% for non-farm workers during 1932. During July of 1932, 11,000 veterans marched on Washington, demanding immediate cash payment of the soldier's bonus instead of spreading it out over several years.

The atmosphere of unrest, if not revolution, unsettled investors, businessmen and politicians, especially as socialism and communism were becoming more popular.<sup>203</sup>

Economic conditions were miserable. In New York, most of the major hotels were in default. Tax arrears in New York City reached 26%. Conditions were even worse than in the farm areas, where drought and low prices combined to bankrupt farmers. Problems in the banking system dominated short-term money markets in 1932.<sup>204</sup> This crisis virtually halted bank lending in the second half of 1932, as banks wanted to conserve cash and could not lend prudently.<sup>205</sup>

The great New York City banks had become the liquidity reserve for the rest of the financial system. Corporations and institutions which feared that their deposits would be tied up in closed domestic banks transferred deposits to New York. Regional banks built up their liquid assets by increasing interbank deposits with New York, so when the outflow from New York banks occurred it essentially represented the end of capitalism as we know it. In July 1932, it seemed as though the capitalist system had shut down, government was paralyzed and anarchy was brewing.<sup>206</sup>

On an otherwise un-eventful Friday - July 8, 1932 - the stock market bottomed.<sup>207</sup> Going into its final low, volume was very low. Most of the speculative positions had been wiped out by that time. Understandably, risk premiums were extremely high.<sup>208</sup>

The lowest point for commodities prices was during the liquidity crisis in May and June, which was also the low point for stock and bond prices and for the economy. Interestingly, as the liquidity crisis worsened, stock and bond markets strengthened in the second half of 1932.<sup>209</sup> The corporate bond market recovered in the third quarter as quickly as it had declined in the second quarter, in line with improvement in the stock market and modest recovery in the economy.<sup>210</sup> The Dow recovered in August and September to a peak of 80, which was almost double the low hit in July (see below).<sup>211</sup>

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<sup>203</sup> Wigmore p. 316

<sup>204</sup> Wigmore p. 316

<sup>205</sup> Wigmore p. 326

<sup>206</sup> Wigmore p. 320

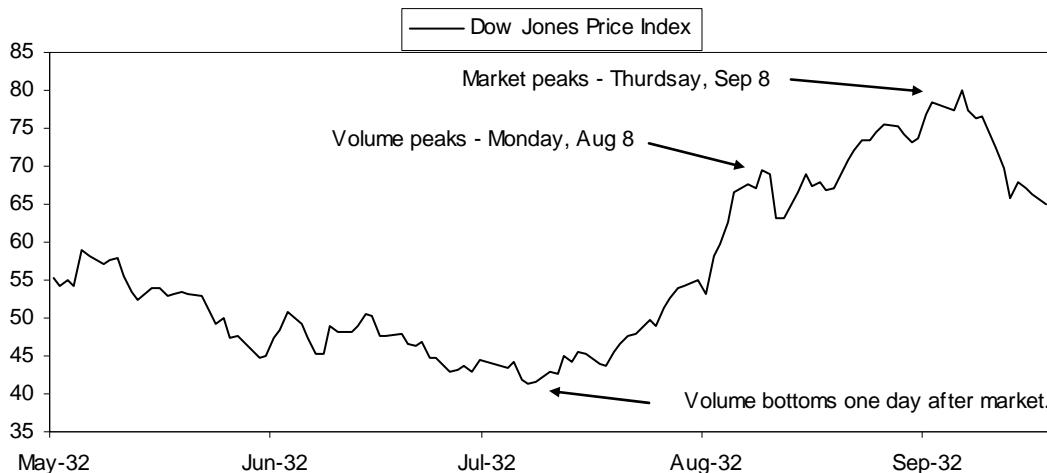
<sup>207</sup> Armstrong p. 427

<sup>208</sup> Armstrong p. 402

<sup>209</sup> Wigmore p. 327

<sup>210</sup> Wigmore p. 397

<sup>211</sup> Wigmore p. 333



Source: Global Financial Data

During 1932, arguments over the war debts and reparations created a problem for confidence. As the December 1932 payment date approached, England and France petitioned the United States for a further extension of the moratorium on payments. The moratorium was not extended, so in December, France, Belgium, Hungary and Poland defaulted on their war debts. England paid its installment, as due, in gold.

The situation in Germany was much worse. The policies of government had forced on Germany a severe deflation, which by the fall of 1932 had cut the standard of living by nearly 50%. As a result, political and social conflicts intensified. Polarity increased, and Communistic and Hitlerist groups gained popularity.<sup>212</sup> There were regular weekend street riots between Nazis and Communists in which deaths were frequent. In July, the Reich took over the government of Prussia and declared a state of emergency in Berlin, in September the military pushed the Republic to request the right to rearm, and the country's finances appeared to be collapsing. German gold reserves continued to decline.<sup>213</sup> These circumstances led to Hitler's victory in 1932.

Japan also became militaristic and invaded Manchuria in 1931 and Shanghai in 1932. Domestic and international conflicts increased around the world.<sup>214</sup>

There were opportunities in 1932 to make significant profits from the price movements in middle grade bonds. For example, Australia's bonds rose over 150% from their lowest 1931 price of \$35; Finland's bonds doubled in price from a low of \$34 in 1931 to a high of \$68 in 1932; bonds of Argentina rose 92 1/2% from their 1931 low price; Japan's rose by 72%; and Czechoslovakia's rose by approximately 50%. Investors could have tripled their money in the bonds of Chile, Peru, Bolivia, Uruguay, Yugoslavia, and Berlin between their low and high prices for 1931-32. Chile's bonds traded between \$15 and \$3 1/2, Peru's between \$10 and \$3, Bolivia's between \$10 and \$3 1/4.<sup>215</sup>

Western Europe's bonds recovered from the 1931 currency crisis, and the yields on the best bonds declined to nearly as low as Aaa corporate bond yields. However, East European and South American bonds hit new low prices in 1932 as these parts of the world suffered such social and economic dislocations that even the most daring speculators were unwilling to bet on these bonds.<sup>216</sup>

<sup>212</sup> Armstrong p. 441

<sup>213</sup> Wigmore p. 415

<sup>214</sup> Armstrong p. 414

<sup>215</sup> Armstrong p. 414

<sup>216</sup> Wigmore p. 416

The gold drain also stopped, and foreign funds began to return to the United States. Foreign optimism improved considerably, especially in England, Germany, France and Australia. A League of Nations survey on the world economy found cautious optimism in most countries.

Why did the stock market bottom in early July? There was not much big news to bring it about. On July 2, Franklin D. Roosevelt was nominated at the Democratic National Convention, but this was no great surprise. The Wall Street Journal attributed the rally to a cessation of gold outflows, rumors of foreign buying, a general rise in commodity prices, and the approval of a railroad merger. Time magazine pointed to the rally in commodities, which was the single biggest jump in across the board commodities since 1925, but the commodities eventually fell to new lows in November though the stock market held the July lows and never violated the 50 area again.

Short covering was clearly a factor behind this bull move. Cornered bears, fat with three years of profits, fought madly to cover their short positions. Much of the buying flowed from Europe into the States, which also pushed the dollar higher. European buying of U.S. securities, which was reported from many sources in July, was largely driven by a hedge against a fear of further devaluations of European currencies.

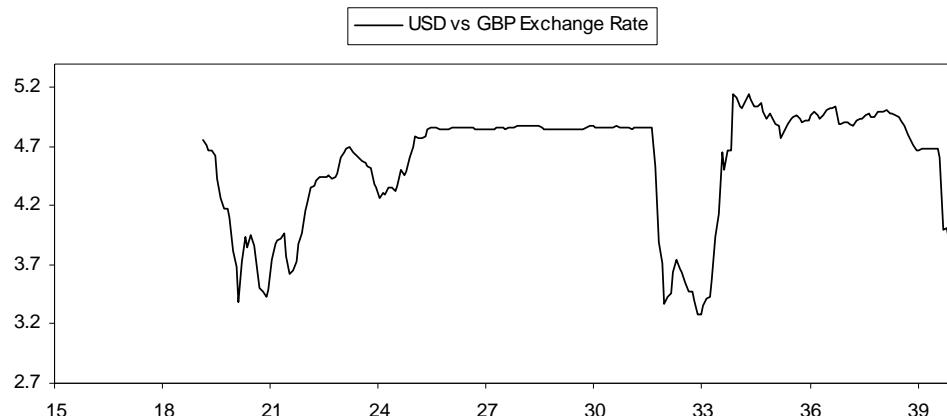
In August 1932, the CCC decided to lend on the collateral of raw materials. The Commodity Credit Corporation was set up by New York City banks in August 1932 at the urging of the then Federal Reserve Board Chairman, Eugene Meyer, to lend on the collateral of raw materials.

There was also a strong corporate bond market rally, despite worsening economic conditions.

Roosevelt was elected amid widespread brokerage commentary that his success would halt the economic recovery and provoke a new crisis in securities markets. The Federal Reserve halted its open market purchases after August. Bank problems were obviously accelerating as well. New York City suddenly plunged into a major crisis. The news was bad. The old adage that when a market declines on bullish news, it must mean that it's a bear market and, conversely, when a market rallies on bearish news, it must be a bull market, proved true.

Roosevelt's campaign for the Presidency began in August with a strong anti-market tone, which added to the volatility of the market. Franklin Roosevelt opened his campaign with a nine-point speech focused solely on securities abuses and demanding federal control of stock and commodities exchanges. He criticized the Hoover Administration for the activities of 1929, for the activities of bank investment affiliates, for Federal Reserve policies, for foreign bond issues, and for stock market speculation.<sup>217</sup> Roosevelt also indicated that he favored a devaluation of the dollar.

Europeans began to sell the dollar dramatically when Roosevelt won the election, because he represented soft money to them.



<sup>217</sup> Wigmore p. 314

The stock market did not recover during the rest of the year because fear of Roosevelt's success was widespread up to the November 8<sup>th</sup> election, and the reality of it did not engender investor confidence.

But to the average working man this election was reason for optimism. The Republicans were marked as the party for the rich and the Democrats emerged as the defender of the poor and working class. So while capitalists were scared, workers were hopeful.

On the eve before the elections, pressure from many sectors demanded that Roosevelt clarify his position about devaluation. He did. He pledged that he would not abandon the gold standard and conveyed that concerns he would devalue were not warranted. He was not the first nor the last government official to knowingly mislead the public regarding their willingness to support their currencies.

Though very painful, the deleveraging was not devastating for everyone. Throughout the deleveraging, major companies except for railroads and investment companies didn't default. Numerous industries did not have losses, and several even maintained their profit levels. Cigarette companies, can manufacturers, food, drug, grocery and variety store companies, and utilities all kept their net income at levels up to half their 1929 levels.

In contrast, bonds of East European and South American governments fell to approximately 10% of par value. Many railroad bonds, too, had great losses, but among the major issues which lost their top credit ratings the decline was to approximately 40% of par. Only a small proportion of municipal bonds went into default.

## 1933

Upon Roosevelt's winning the election, rumors began to spread that a devaluation was in the works. The Democratic party had long been a symbol of "soft money," going back to the 1890s when they were known as the "Silver Democrats" with William Jennings Bryan's famous speech of "Thou shalt not crucify mankind upon a cross of gold." And Roosevelt's campaign rhetoric encouraged these rumors.<sup>218</sup>

A devaluation would help workers by raising wages, but it would hurt debtholders as the value of their securities was tied to the value of money. So, investors fled, and in January, there were big gold withdrawals. Foreign banks began to redeem their dollars for gold, further increasing the drain upon reserves, and the withdrawal of gold coin from the Treasury was approaching a crisis level as private investors also sought to convert their bonds into gold.<sup>219</sup>

On the 18<sup>th</sup> of February, a Senator who had publicly accepted the post of Secretary of the Treasury under Roosevelt announced that he had refused the post because upon meeting with Mr. Roosevelt, the President-elect would not provide the Senator with an assurance that the gold standard would be maintained. The New York Times wrote "...at no time in the recent economic history of America has there been greater need than at present for a flat declaration of a monetary policy by the new American government. A declaration by Mr. Roosevelt declaring firm resolution to maintain a sound currency would have an extremely reassuring effect." He did not reply with these assurances, which raised concerns.<sup>220</sup>

Between November 1932 and March 1933, there was clearly an anticipation of possible reflationary policies of the President-elect which caused a flight from the dollar, which sparked numerous Europeans to dump their holdings, and which in turn forced the Dow Jones Industrials down from 62 to 50 moving into February 1933. Investor hoarding of gold and foreign investors leaving the U.S. hastened the banking liquidity crisis.

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<sup>218</sup> Armstrong p. 446

<sup>219</sup> Armstrong p. 448

<sup>220</sup> Armstrong p. 449

In reaction to this flight from the dollar and from the U.S., Hoover wanted capital export controls.<sup>221</sup> Foreign exchange controls are quite normal in situations like this and very scary for investors. To justify his ability to do this, Hoover attempted to use the War Powers, but the Democrats blocked this move,<sup>222</sup> which is interesting as typically left of center governments are in favor of capital controls and right of center governments are against them. The panic out of the U.S. accelerated from a slow pace to a stampede. Specifically, the gold stock declined slowly at first, from \$4,279 million on January 18, 1933, to \$4,224 million on February 15, 1933. It dropped a further \$168 million by March 1st, another \$100 million by March 3<sup>rd</sup>, and reports circulated that over \$700 million would be presented for gold on March 4<sup>th</sup>, the day of Roosevelt's inauguration.<sup>223</sup>

From the November low of \$3.15 when Roosevelt was elected, the pound jumped to \$3.43 by February just before this inauguration for an 11.25% gain. The smart money in the United States was buying foreign exchange while the masses were hoarding gold in ever increasing quantities. In the end, those who had bought the foreign exchange profited, while those who hoarded gold in the U.S. found themselves trapped, i.e. if they did not surrender their gold hoardings at the old value of \$20 prior to Roosevelt's devaluation in January 1934<sup>224</sup> they were subject to criminal prosecution. It wasn't easy being an investor or a capitalist in those days. Business activity hit a low point in March 1933. In 1933, the Gross National Product reached its lowest point in the Depression at \$55.6 billion, or 46% below 1929. In constant dollars this was 31 ½% below 1929.<sup>225</sup>

When the banks closed in many states during February and March, many businesses closed completely. The resulting low level of business activity in February and March 1933 was shocking.<sup>226</sup>

## March 1933

### Roosevelt Assumes Office and Declares a Banking Moratorium and Other Policies in His First 100 Days

*Roosevelt's Inauguration speech can be found in Appendix 1.*

When Roosevelt assumed office on March 4, he declared a banking moratorium enacting the War Powers Act (which he had helped prevent Hoover from using), and he let the dollar slide.<sup>227</sup> The stock market and the banks remained closed.

The reflation worked! By then, rents and debt service obligations and equity levels had been substantially reduced, so it took less stimulation to raise cash flows above debt payments. From 1929 to 1933, the bankruptcies and other forms of restructuring had reduced the debt by about 21% and financial wealth by about 30%. The deleveraging had also substantially reduced businesses' operating costs and break even levels, so it took less revenue growth than before to make them profitable. Furthermore, it increased risk premiums of investment assets to very high levels. So, reflation via currency devaluation and increased liquidity raised commodity and export prices and lowered real yields (making cash unattractive). Additionally, the inability to buy gold or move money out of the country made stocks relatively attractive. In the September 25, 1933 edition of Time magazine, the moves of capitalists to protect their wealth in this environment were described as follows: "Methods of hedging against inflation within U.S. frontiers have become a favorite coffee and cognac topic."

Purchase of industrial stocks is, of course, the most popular hedge, but commodities and land have been creeping up fast since the NRA threatened profits with higher labor costs. Some shrewd businessmen with little capital at stake argue that the best thing is to go as deep into debt as the banks (or friends) will allow; eventually they will

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<sup>221</sup> Armstrong p. 449

<sup>222</sup> Armstrong p. 449

<sup>223</sup> Armstrong p. 447

<sup>224</sup> Armstrong p. 446

<sup>225</sup> Armstrong p. 429

<sup>226</sup> Armstrong p. 429

<sup>227</sup> Armstrong p. 451

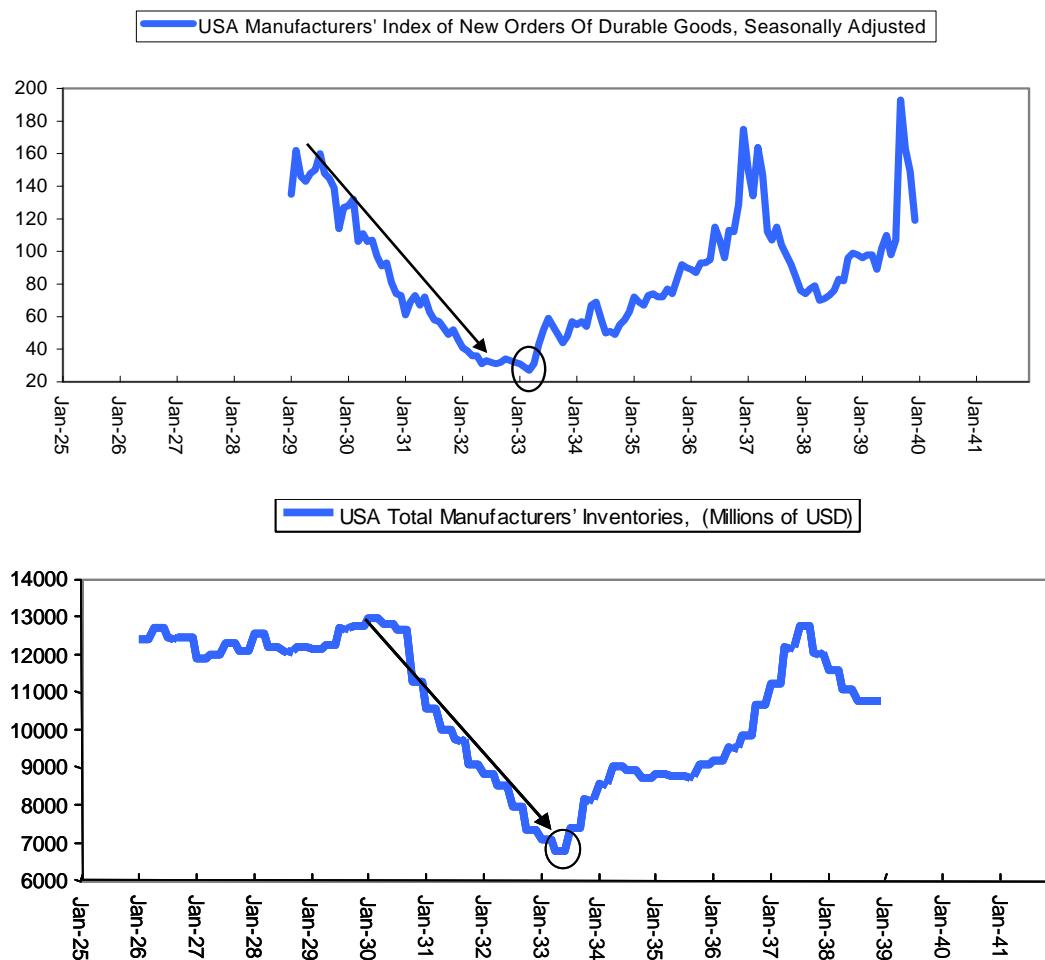
pay off with cheaper dollars." The market action was great. Also, there was significantly increased government spending that helped.

Stock, bond, and commodities prices rose dramatically throughout March following the Bank Holiday. Moody's daily index of staple commodities actually rose 6% from Friday, March 3rd, to Tuesday, March 7th. The stock market reopened on March 15th. It was initially near the 62 level, but fell back to 56 for the end of the month.<sup>228</sup>

The U.S. Treasury offered two new bond issues on March 13th - \$400 million due August totaling \$1.8 billion. Interestingly, after the dollar devaluation, the gold outflow was reversed, and the United States gained over \$325 million in gold in the week ending March 15th. Bank borrowing at the Federal Reserve dropped \$180 million in the same week as banks got more cash. During the next two weeks, short-term rates dropped 1%-2% as cash returned, and Fed policy remained easy. Bankers' acceptance rates fell back to 2%, and call loan rates fell to 3%, as the Federal Reserve cut its buying rate for 90-day acceptances 3 times within five days.<sup>229</sup>

The first batch of charts below shows various measures of economic activity and prices. They all convey the 'V' bottom that occurred at the moment when the Fed substantially increased liquidity (which necessitated the dollar's devaluation against gold and other currencies).

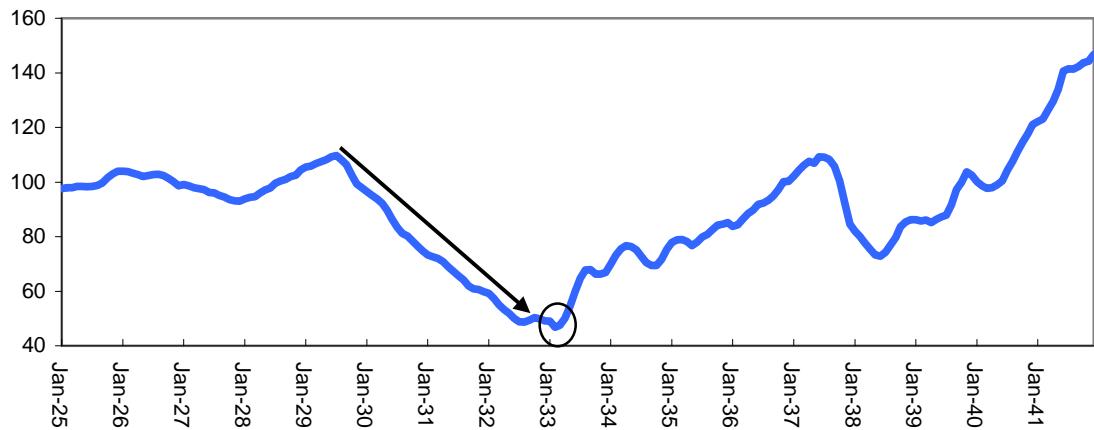
*Note: Data in the charts on the following 7 pages is taken from Global Financial Data or the NBER Macrohistory Database.*



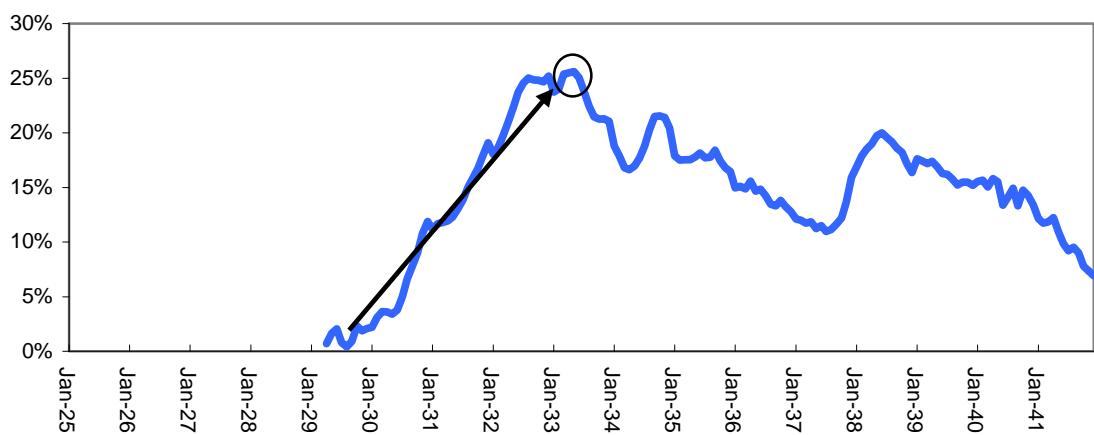
<sup>228</sup> Armstrong p. 451

<sup>229</sup> Wigmore p. 450

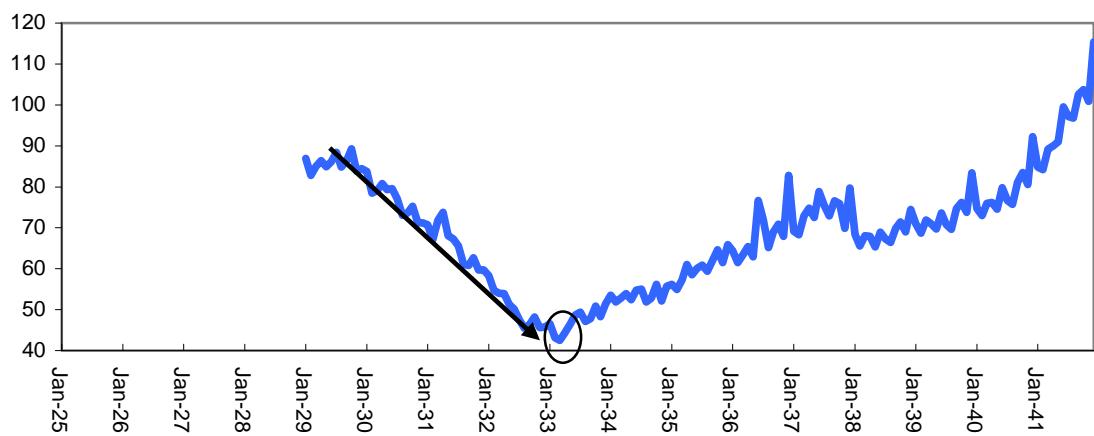
— USA Index of Factory Employment, Total Durable Goods



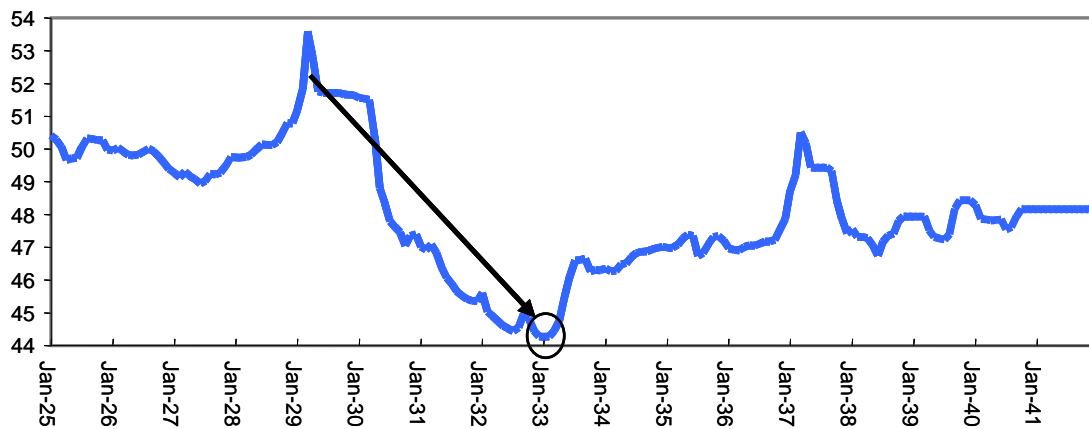
— USA Unemployment Rate



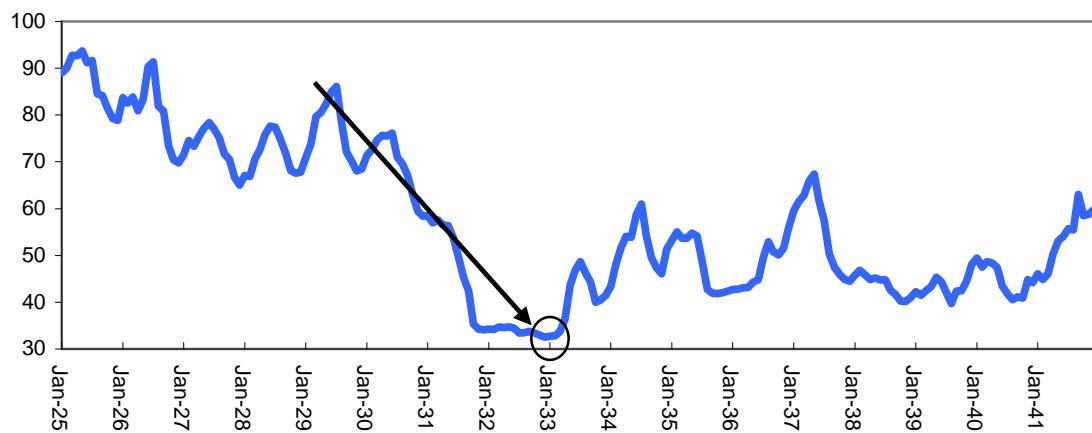
— USA Personal Income, Billions of USD at Annual Rates



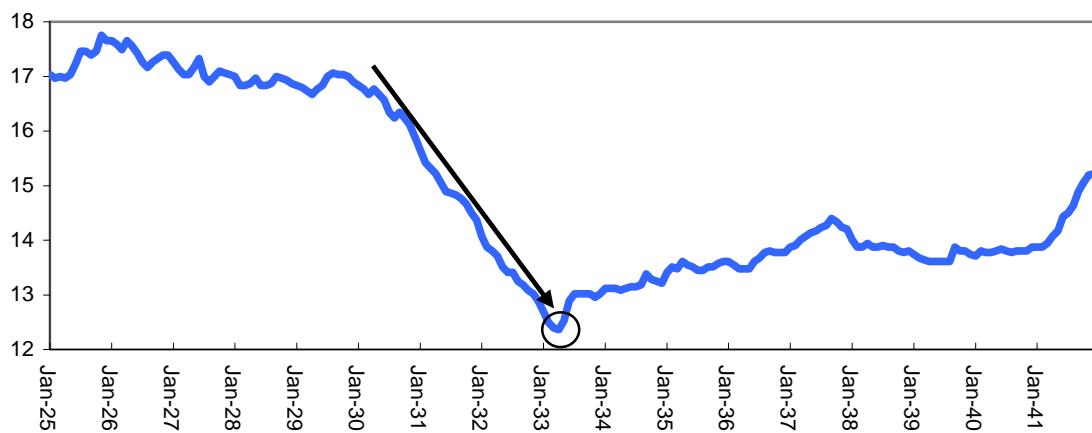
USA JOC Commodity Index

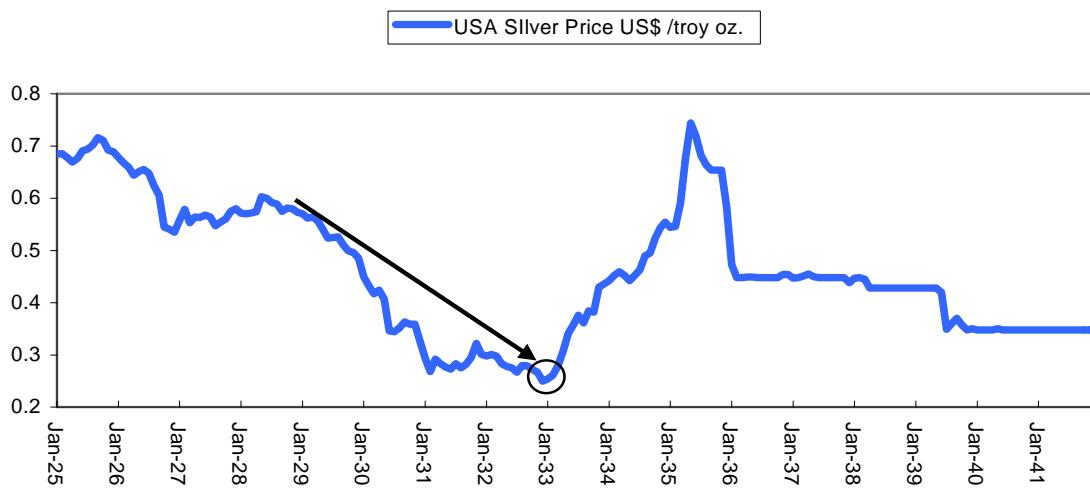


USA CRB

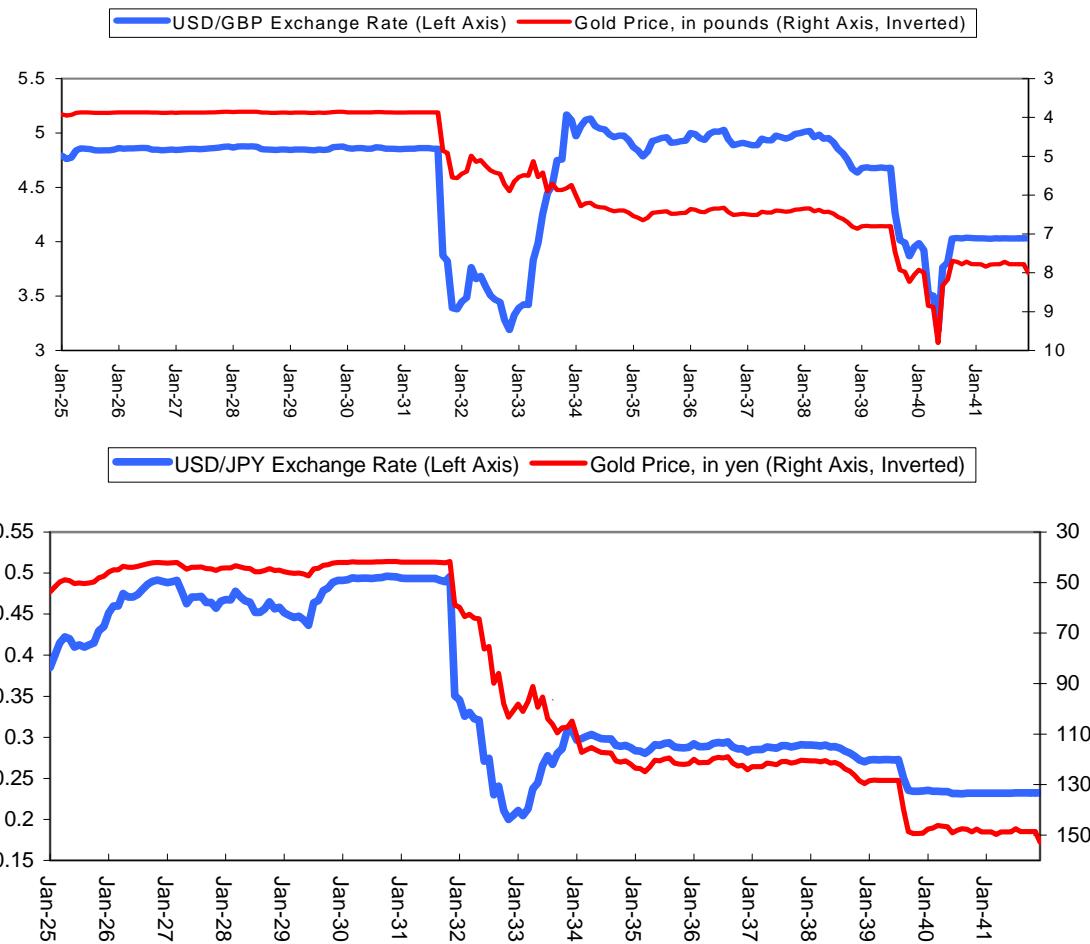


USA CPI INDEX

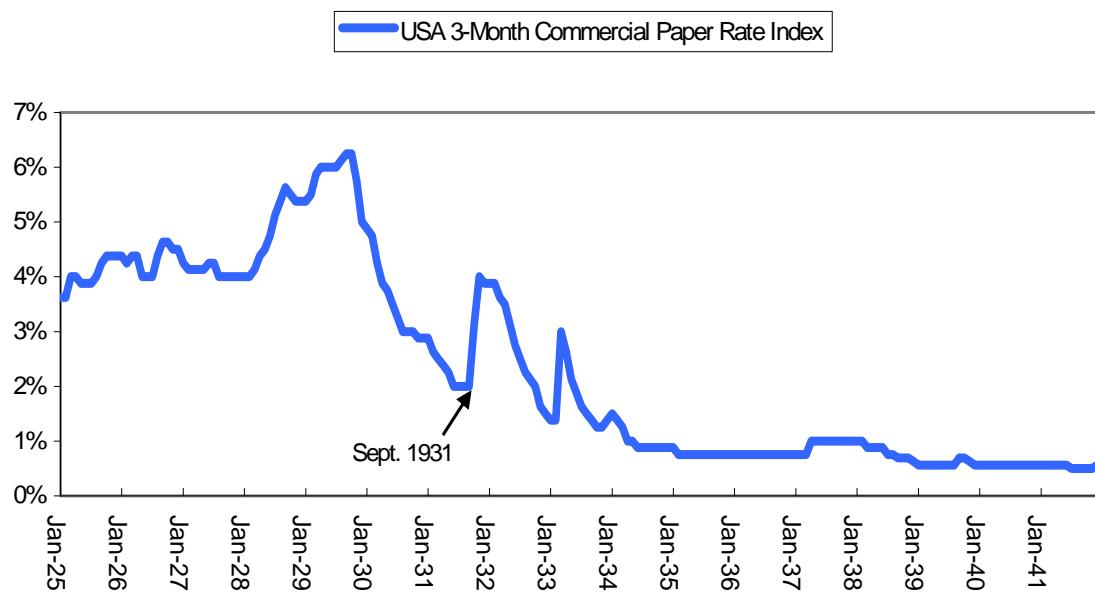
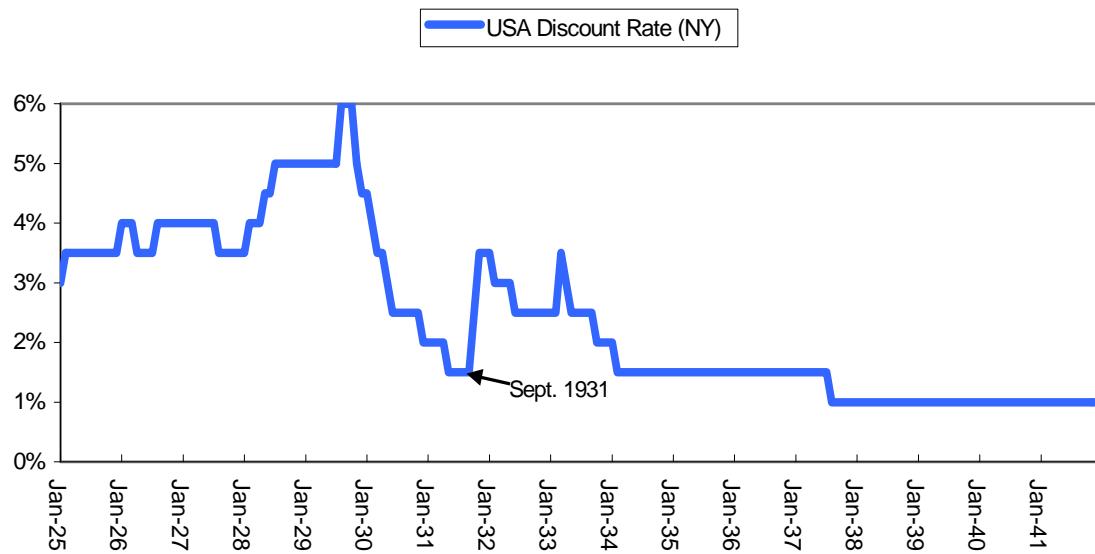




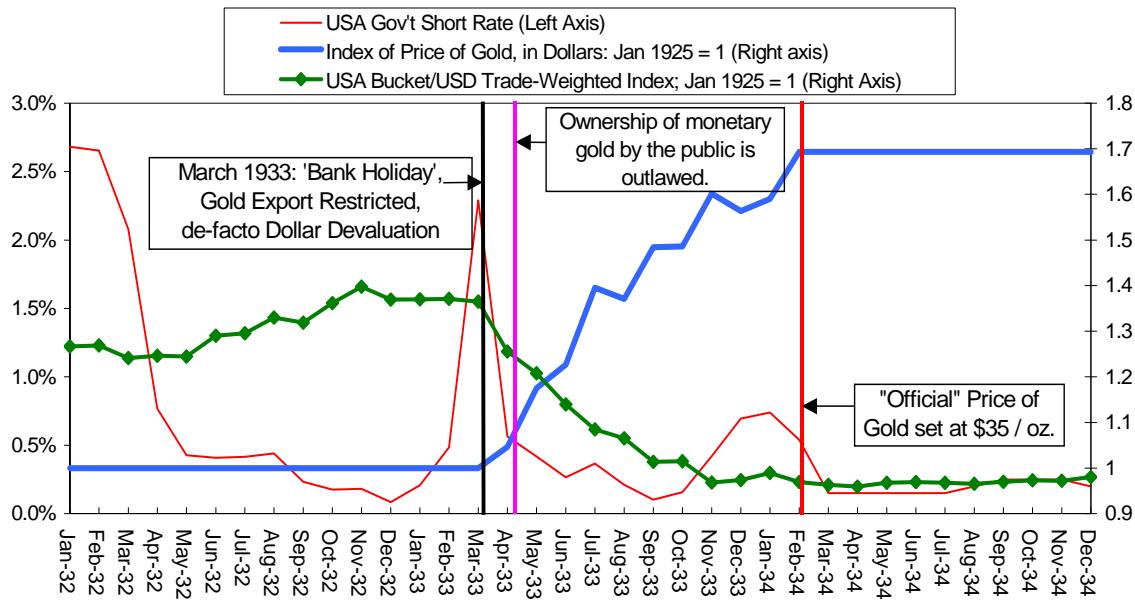
Before showing you the dollar's devaluation and the increase in liquidity that was behind this reversal, I want to point out a few other things. The next two charts show the British and Japanese devaluations (against both gold and the USD).



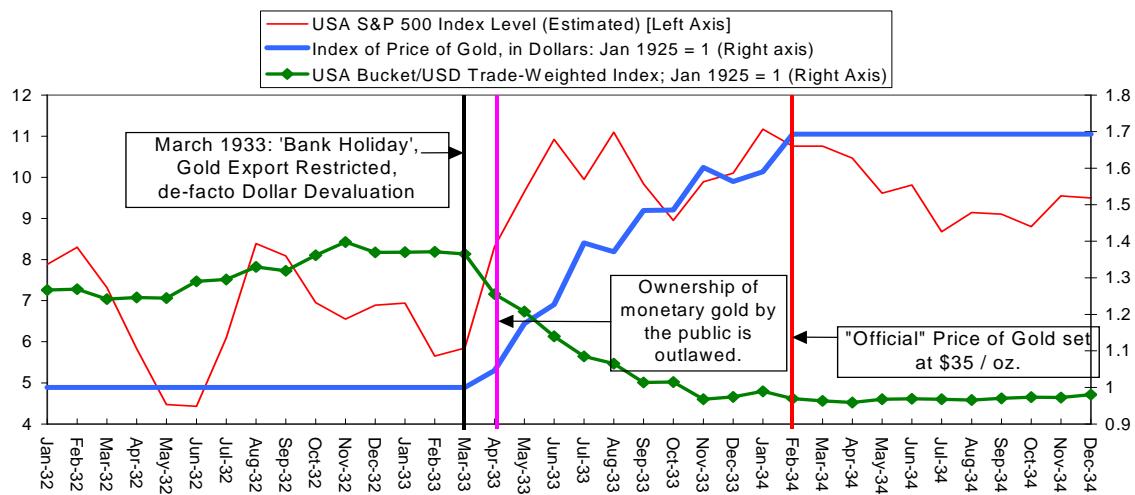
As mentioned before, largely as a result of the dollar becoming overvalued and the credit crisis in the U.S., capital started to shift out of the U.S. and the dollar, forcing the U.S. to choose between tightening and devaluating. The next couple of charts show the Fed's tightening and associated interest rate changes that occurred in 1928 - 29 and in 1931-33 (until the devaluation).



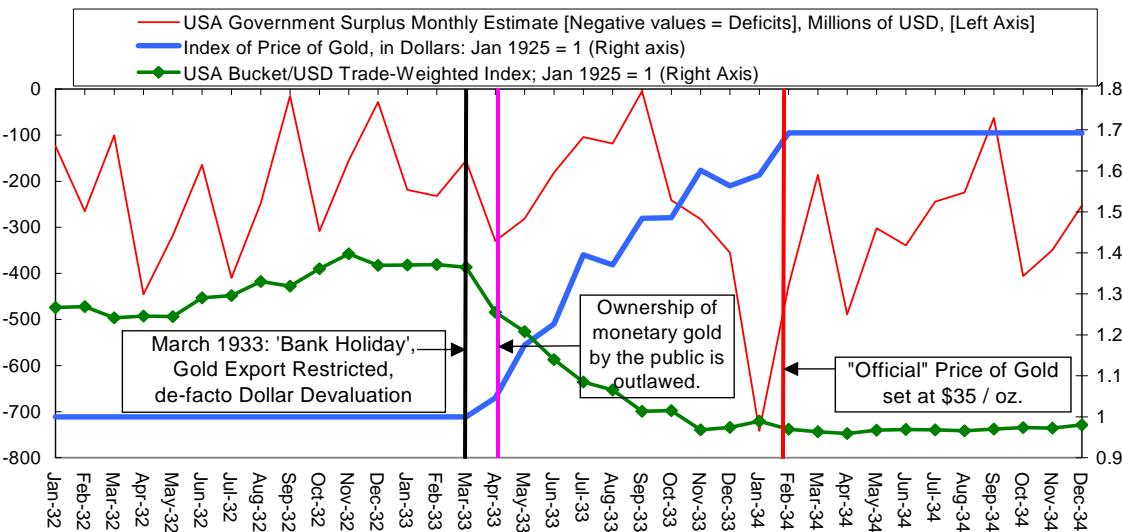
The next batch of charts focuses in on 1932 - 34 - i.e., to squint at this period, we zoomed in on it (showing monthly numbers). The first chart shows the dollar, gold, and the government short rate. Note in the first chart how the government short rate shot up going into the devaluation (because of the currency defense), as money was being withdrawn from banks and from the U.S., and then how a) the bank "holiday", b) gold exports being disallowed, and c) the devaluation occurred together. When the banks opened their doors, everyone could get their money because it was provided freely. In other words, liquidity was increased to help alleviate the debt crisis. Interest rates continued to fall while stocks, the economy, commodity prices, and inflation all rose from 1933 to 1937, which was the same as during other post-liquidity squeeze periods (e.g. post ERM break-up and post 1980).



The next chart is the same as the previous one, except that it inserts a stock price index (S&P 500 estimate) instead of the interest rate.



The next chart is the same except that it shows the budget balance and drops stock prices. As shown, the fiscal stimulation didn't occur until after the liquidity increase and economic recovery were well underway.



Once in power, Roosevelt used the RFC's powers actively. The array of financial institutions which had been forced to rely on the RFC was staggering up until then, e.g., by December 31, 1932, loans had been authorized to 5,582 banks, 877 savings banks, 101 insurance companies, 85 mortgage loan companies, and 3 credit unions – a total of 6,648 institutions – for a total commitment by the RFC of over \$1.25 billion. An additional \$333 million had been committed to 62 railroads which were borrowing heavily from the banks. But this was small potatoes in relation to what was to come.<sup>230</sup>

A Glass-Steagall II was passed, and it provided a federal government guarantee on all bank deposits up to \$2500, eliminated interest on demand deposits, set margin limits on loans to carry securities, set the limit that one bank could lend to one creditor at 10% of the bank's capital, and split commercial banking and investment banking functions into two industries.<sup>231</sup>

Also, The National Industrial Recovery Act was passed, which was based on many of the ideas of Bernard Baruch, who had become one of Roosevelt's financial advisors. The act authorized \$3.3 billion in public works. Also, the Home Owners Loan Act provided a federal guarantee to refinance mortgages on homes costing less than \$20,000. The Agricultural Adjustment Act provided for the withdrawal of farm land under production in return for federal cash payments, 4 ½% refinancing of farm mortgages, and a promise of farm product price supports at a minimum of production cost. The Act also provided numerous measures to promote credit expansion, including presidential authority to devalue the gold content of the dollar by up to 60%.<sup>232</sup> A special Sunday night session of Congress was called to consider the Emergency Banking Act, which authorized the RFC to borrow without limit and to buy preferred stock in closed banks without collateral to help them reopen. The act allowed bank notes to be issued up to 90% of collateral and the Federal Reserve to make loans against any collateral. When banks were reopened, government influence over the financial markets was established, and rescue missions were put in place by the RFC. At the end of March, the RFC announced hurriedly prepared regulations governing RFC purchases of preferred stock in closed banks in order to help them reopen, and by the end of June 1933 made preferred stock purchases or loans.<sup>233</sup>

<sup>230</sup> Wigmore p. 423-4

<sup>231</sup> Wigmore p. 423-4

<sup>232</sup> Wigmore p. 424

<sup>233</sup> Wigmore p. 449-450

<sup>234</sup> Wigmore p. 451

President Roosevelt announced the end of the gold standard on April 22nd. All those who failed to turn their gold into the Federal Reserve were subject to a maximum fine of \$10,000 plus ten years in jail.<sup>235</sup> President Roosevelt issued an executive order, under power given him by Congress in the emergency banking act, ordering all holders of gold to turn it in to the government by May 1 or take the penalty. In May, when interest on U.S. gold bonds was due, which meant that interest to be paid in gold, not paper, Roosevelt broke the "covenant" as payment in paper dollars was mandated.<sup>236</sup>

In June the new Securities Act of 1933 came into being. It stated that if any "material" fact is misstated or if any "material" fact is omitted, each director is held personally liable for the loss incurred by a buyer of the security. The Securities Act also required registration of all new securities offerings with the Federal Trade Commission (FTC), with the exception of local government issues, bank deposits, and commercial paper. The securities industry complained about the Securities Act, principally because it established criminal and civil liability for all participants in an issue for all facets of it for up to two years after the discovery of any untrue statement or omission in the prospectus, or up to ten years after the date of issue.<sup>237</sup>

Going off the gold standard caused stocks and commodities to soar. During early June, the meaning of the news about gold, the dollar, and foreign exchange controls finally hit home. The President was not going to cut the gold content of the dollar as expected, but he was going to eliminate the gold clause from public and private contracts.<sup>238</sup> So with gold completely out of the picture as a store of wealth at any price in the U.S., the choice was to move money abroad or into something tangible in an environment of the falling value of money.<sup>239</sup> Investors wanted something tangible so they bought stocks which shot prices to the best levels in two years. Similarly, commodities rallied to their highest level since the inflation boom began. This type of market action is consistent with currency devaluation because, when the value of money declines, most things measured in it rise, and devaluations raise incomes because of price increases and improved export sales.

Stock multiples exploded as risk premiums fell. For example, stock prices for companies with meaningful earnings averaged 22.7 times 1933 earnings per share, compared with 10 times 1933 earnings in February, before Roosevelt's inauguration. Stocks at their highest prices went back to 85% of their 1929 low prices.<sup>240</sup>

Economic conditions improved dramatically in just a few months, and securities and commodities prices quickly doubled. Business activity rose to 89.5 in July versus a low point of 58.5 in March 1933 and a peak of 116.7 in July 1929. This change was partly due to the end of the banking crisis, partly due to the devaluation of the dollar, which helped to raise prices, and partly due to the confidence Roosevelt inspired.<sup>241</sup>

In July, stock prices had a big correction. The Dow Jones Industrials had fallen 19.96 points in just three days! This raised concerns that the good times were over and the economy was going to plunge again. But this time the opposite was true. Prices traded in a range for several months before moving higher.

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<sup>235</sup> Wigmore p. 451

<sup>236</sup> Armstrong p. 454-6

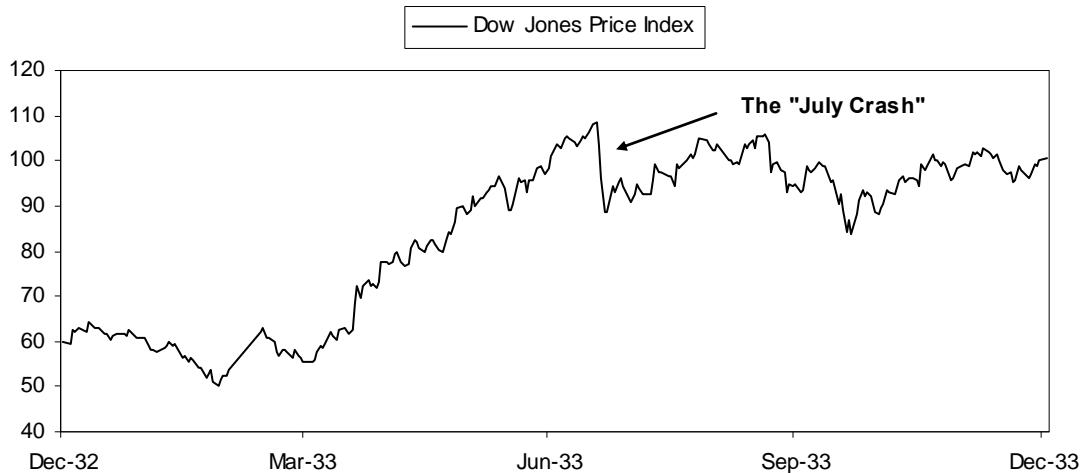
<sup>237</sup> Wigmore p. 425

<sup>238</sup> Armstrong p. 425

<sup>239</sup> Wigmore p. 450

<sup>240</sup> Wigmore p. 456

<sup>241</sup> Wigmore p. 431



Source: Global Financial Data

If gold was a good asset to hold but illegal, were gold stocks a good proxy and therefore a good investment? Initially, they were, but later they were not. The fixed gold price and inflation were bad for gold mining companies as their costs rose – e.g., “He would not let them sell their gold to anyone except the U.S. government and the Government would pay only \$20.67. Gold miners were out of luck – their costs mounted but the price of their product remained the same.” However, because Roosevelt wanted to have this mined gold in foreign exchange, Roosevelt decided to allow the gold mines to deliver their product to the Federal Reserve and the Fed to sell the gold to foreign buyers at the world price. We are not sure exactly how this deal worked.<sup>242</sup>

The devaluation had converted unacceptable deflation into acceptable inflation.<sup>243</sup> There was no statement of an inflation target (which nowadays we would expect), but the results were the same. Inflation went from -10% in 1932, to -5% in 1933 and +3% in 1934, mostly because the dollar fell by 39% against gold and 36% against the pound in 1933 (December to December).

Fearing more attacks on their wealth, U.S. citizens exported their dollars by the hundreds of millions to get them some place that they felt was safer. “One of our problems,’ droned Viscount Cecil of Chelwood, chairman of Britain’s delegation, ‘is the flood of unwanted money that is pouring into our banks. These funds, deposited in the main by U.S. investors, are subject to withdrawal at 24-hour notice and are of little or no value, though it has not yet been discovered how to get rid of them.’<sup>244</sup> Interestingly, Washington encouraged the flight of the dollar to weaken it. Unlike exports of gold, which were strictly banned for private citizens, the flight from the dollar was quietly encouraged by Washington.<sup>245</sup>

It turned out that Roosevelt could not declare gold to be illegal to own outright, since that would have been a violation of the Constitution, so he took another approach which the courts ruled permissible. It was ordered that all U.S. citizens file a report to declare how much gold they held. Failure to file the report carried a \$10,000 fine or ten years in jail.<sup>246</sup>

<sup>242</sup> Armstrong p. 461

<sup>243</sup> Armstrong p. 461

<sup>244</sup> Armstrong p. 464

<sup>245</sup> Armstrong p. 468

<sup>246</sup> Armstrong p. 462

Treasury bonds were also strong. For example, the lowest 1933 prices for the three heavily traded U.S. Treasury issues in the Statistical Appendix were \$2 and \$6 above their lowest 1932 prices.<sup>247</sup> Below is a table of monthly T-bond, T-bill, Baa bond and commercial paper yields from January 1933 to December 1934.

|                 | <b>Corp<br/>Baa</b> | <b>Commercial<br/>Paper</b> | <b>T-bill</b> | <b>Long Bond</b> |
|-----------------|---------------------|-----------------------------|---------------|------------------|
| <b>Jan 1933</b> | 8.68                | 1.38                        | 0.21          | 3.22             |
| <b>Feb 1933</b> | 8.79                | 1.38                        | 0.49          | 3.31             |
| <b>Mar 1933</b> | 8.63                | 3.25                        | 2.29          | 3.42             |
| <b>Apr 1933</b> | 7.39                | 2.25                        | 0.57          | 3.42             |
| <b>May 1933</b> | 6.83                | 2.13                        | 0.42          | 3.30             |
| <b>Jun 1933</b> | 6.60                | 1.63                        | 0.27          | 3.21             |
| <b>Jul 1933</b> | 6.86                | 1.50                        | 0.37          | 3.20             |
| <b>Aug 1933</b> | 7.57                | 1.50                        | 0.21          | 3.21             |
| <b>Sep 1933</b> | 7.47                | 1.25                        | 0.10          | 3.19             |
| <b>Oct 1933</b> | 8.21                | 1.25                        | 0.16          | 3.22             |
| <b>Nov 1933</b> | 7.63                | 1.25                        | 0.42          | 3.46             |
| <b>Dec 1933</b> | 6.62                | 1.50                        | 0.70          | 3.53             |
| <b>Jan 1934</b> | 6.24                | 1.38                        | 0.74          | 3.48             |
| <b>Feb 1934</b> | 6.24                | 1.38                        | 0.54          | 3.28             |
| <b>Mar 1934</b> | 5.92                | 1.13                        | 0.15          | 3.15             |
| <b>Apr 1934</b> | 6.12                | 1.00                        | 0.15          | 3.09             |
| <b>May 1934</b> | 6.04                | 1.00                        | 0.15          | 3.02             |
| <b>Jun 1934</b> | 6.37                | 0.88                        | 0.15          | 2.97             |
| <b>Jul 1934</b> | 6.47                | 0.88                        | 0.15          | 2.94             |
| <b>Aug 1934</b> | 6.48                | 0.88                        | 0.20          | 3.05             |
| <b>Sep 1934</b> | 6.35                | 0.88                        | 0.25          | 3.23             |
| <b>Oct 1934</b> | 6.30                | 0.88                        | 0.25          | 3.05             |
| <b>Nov 1934</b> | 6.22                | 0.88                        | 0.25          | 3.05             |
| <b>Dec 1934</b> | 5.85                | 0.88                        | 0.20          | 2.99             |

Source: Global Financial Data

<sup>247</sup> Wigmore p. 499

## 1934-1938

### International Devaluations Follow the Dollar Devaluation

Between 1934 and 1936 there was a battle of official devaluations to gain price and trade advantages.<sup>248</sup> Eventually, the French franc's overvaluation led to domestic pressures to devalue, which caused the French to act in September 1936. As part of that devaluation, the Tripartite Agreement was reached among the United States, Britain and France, which essentially stated that each nation would refrain from competitive exchange depreciation. By then, it became obvious that all countries could just as easily devalue their currencies in response to other devaluations, and a war of competitive devaluation caused turbulence only to get everyone right back where they began.<sup>249</sup> At the end of the day, the result was that all currencies devalued a lot against gold and not much against each other.

It was the contraction from the 1937 high which gave rise to a new term which was "recession."<sup>250</sup> It is worth a look at some of the key stats from 1933-1941.

Key Statistics (1933-1941)

|                                | 1933 | 1934 | 1935 | 1936 | 1937 | 1938 | 1939 | 1940 | 1941 |
|--------------------------------|------|------|------|------|------|------|------|------|------|
| <b>Money Supply M1 (\$bn)</b>  | 19.2 | 21.1 | 25.2 | 29.6 | 30.6 | 29.2 | 32.6 | 38.8 | 45.3 |
| <b>National Debt (\$bn)</b>    | 22.5 | 27.1 | 28.7 | 33.8 | 36.4 | 37.2 | 40.4 | 43.0 | 49.0 |
| <b>GDP (\$bn)</b>              | 225  | 261  | 283  | 330  | 369  | 333  | 359  | 398  | 489  |
| <b>Gov't Outlays (\$bn)</b>    | 4.6  | 6.6  | 6.5  | 8.4  | 7.7  | 6.8  | 8.8  | 9.1  | 13.3 |
| <b>Defense Spending (\$bn)</b> | 1.4  | 1.1  | 1.9  | 2.7  | 2.2  | 1.7  | 1.9  | 2.2  | 7.2  |
| <b>CPI</b>                     | 12.9 | 13.2 | 13.6 | 13.7 | 14.2 | 13.9 | 13.7 | 13.9 | 14.5 |
| <b>Gov't Bond Yield</b>        | 3.2  | 3.0  | 2.7  | 2.7  | 2.8  | 2.5  | 2.2  | 2.3  | 2.0  |
| <b>Corp BAA Bond Yield</b>     | 6.6  | 6.4  | 5.7  | 4.8  | 5.0  | 5.4  | 4.8  | 4.8  | 4.3  |
| <b>Unemployment Rate</b>       | 24%  | 19%  | 18%  | 15%  | 12%  | 17%  | 18%  | 16%  | 12%  |
| <b>Dow Jones Ind. Index</b>    | 59   | 100  | 105  | 144  | 179  | 120  | 153  | 151  | 131  |
| <b>Commodity Index (JOC)</b>   | 17.7 | 19.8 | 20.5 | 20.4 | 22.2 | 21.0 | 21.4 | 21.8 | 21.6 |
| <b>Gold Px in USD</b>          | 20.7 | 34.5 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 34.8 | 34.5 |

Source: Global Financial Data

In 1933–37, bond yields fell and credit spreads shrank. The spread between Moody's AAA corporate bond yield and that of U.S. Treasury issues began to narrow significantly. Corporate yields declined by 27.3% while Treasury yields declined only 17.2%. Stock prices rose, money supply grew and capitalism returned essentially to normal, though at a greatly reduced rate from the 1929 peak. Let's look at this increase in capital formation.

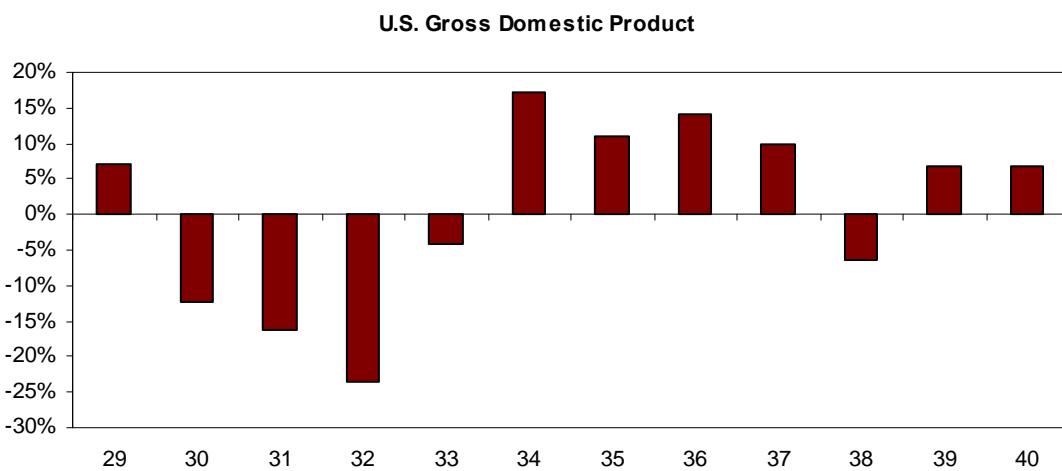
Money supply, as measured by M1, rose some 55% between 1933 and 1937, and total credit expanded by 8%. However, this increase in total debt was due to a 36% increase in government debt and virtually no change in private sector debt. Nominal GDP rose by 48% and the GDP deflator rose by 8% (1.5% per year). Of the \$36 billion increase in nominal GDP that occurred from the end of 1932 to the end of 1937, \$5 billion was from government spending, \$18 billion was from private domestic spending and \$ 5 billion was from exports.<sup>251</sup> The wholesale price index rose 30.8%, or 5.5% per year.

<sup>248</sup> Armstrong p. 474

<sup>249</sup> Armstrong p. 475

<sup>250</sup> Armstrong p. 475

<sup>251</sup> Armstrong p. 478



In 1937, signs of the economy stalling emerged. The stock market had rallied back to the November 1929 low. Commodities, at their peak in 1937, barely managed to rally then declined to new lows. When the severe recession into 1938 began, government expenditures continued to rise in the United States. Total government purchases rose 8.7%, while total GDP declined 5%. Unemployment rose 32.8% between 1937 and 1938, to a rate of 17%. Interest rates began to decline from their 1937 high.<sup>252</sup>

By 1937, real GDP had finally reached its 1929 levels. It was not until 1954 that the Dow finally reached its 1929 levels. In 1939 the U.K. went to war with Germany, which begins another story.

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<sup>252</sup> Armstrong p. 478

## Appendix One

### Roosevelt's First Inaugural Address

President Hoover, Mr. Chief Justice, my friends: This is a day of national consecration, and I am certain that my fellow Americans expect that on my induction into the Presidency I will address them with a candor and a decision which the present situation of our nation impels.

This is pre-eminently the time to speak the truth, the whole truth, frankly and boldly. Nor need we shrink from honestly facing conditions in our country today. This great nation will endure as it has endured, will revive and will prosper.

So first of all let me assert my firm belief that the only thing we have to fear...is fear itself... nameless, unreasoning, unjustified terror which paralyzes needed efforts to convert retreat into advance.

In every dark hour of our national life a leadership of frankness and vigor has met with that understanding and support of the people themselves which is essential to victory. I am convinced that you will again give that support to leadership in these critical days. In such a spirit on my part and on yours we face our common difficulties. They concern, thank God, only material things. Values have shrunken to fantastic levels: taxes have risen, our ability to pay has fallen, government of all kinds is faced by serious curtailment of income, the means of exchange are frozen in the currents of trade, the withered leaves of industrial enterprise lie on every side, farmers find no markets for their produce, the savings of many years in thousands of families are gone.

More important, a host of unemployed citizens face the grim problem of existence, and an equally great number toil with little return. Only a foolish optimist can deny the dark realities of the moment.

Yet our distress comes from no failure of substance. We are stricken by no plague of locusts. Compared with the perils which our forefathers conquered because they believed and were not afraid, we have still much to be thankful for. Nature still offers her bounty and human efforts have multiplied it. Plenty is at our doorstep, but a generous use of it languishes in the very sight of the supply.

Primarily, this is because the rulers of the exchange of mankind's goods have failed through their own stubbornness and their own incompetence, have admitted their failures and abdicated. Practices of the unscrupulous money changers stand indicted in the court of public opinion, rejected by the hearts and minds of men.

True, they have tried, but their efforts have been cast in the pattern of an outworn tradition. Faced by failure of credit, they have proposed only the lending of more money.

Stripped of the lure of profit by which to induce our people to follow their false leadership, they have resorted to exhortations, pleading tearfully for restored conditions. They know only the rules of a generation of self-seekers.

They have no vision, and when there is no vision the people perish.

The money changers have fled their high seats in the temple of our civilization. We may now restore that temple to the ancient truths.

The measure of the restoration lies in the extent to which we apply social values more noble than mere monetary profit.

Happiness lies not in the mere possession of money, it lies in the joy of achievement, in the thrill of creative effort.

The joy and moral stimulation of work no longer must be forgotten in the mad chase of evanescent profits.

These dark days will be worth all they cost us if they teach us that our true destiny is not to be ministered unto but to minister to ourselves and to our fellow-men.

Recognition of the falsity of material wealth as the standard of success goes hand in hand with the abandonment of the false belief that public office and high political position are to be values only by the standards of pride of place and personal profit, and there must be an end to a conduct in banking and in business which too often has given to a sacred trust the likeness of callous and selfish wrongdoing.

Small wonder that confidence languishes, for it thrives only on honesty, on honor, on the sacredness of obligations, on faithful protection, on unselfish performance. Without them it cannot live.

Restoration calls, however, not for changes in ethics alone. This nation asks for action, and action now.

Our greatest primary task is to put people to work. This is no unsolvable problem if we face it wisely and courageously.

It can be accompanied in part by direct recruiting by the government itself, treating the task as we would treat the emergency of a war, but at the same time, through this employment, accomplishing greatly needed projects to stimulate and reorganize the use of our national resources.

Hand in hand with this, we must frankly recognize the over-balance of population in our industrial centers and, by engaging on a national scale in a redistribution, endeavor to provide a better use of the land for those best fitted for the land.

The task can be helped by definite efforts to raise the values of agricultural products and with this the power to purchase the output of our cities.

It can be helped by preventing realistically the tragedy of the growing loss, through foreclosure, of our small homes and our farms.

It can be helped by insistence that the Federal, State, and local governments act forthwith on the demand that their cost be drastically reduced.

It can be helped by the unifying of relief activities which today are often scattered, uneconomical and unequal. It can be helped by national planning for and supervision of all forms of transportation and of communications and other utilities which have a definitely public character.

There are many ways in which it can be helped, but it can never be helped merely by talking about it. We must act, and act quickly.

Finally, in our progress toward a resumption of work we require two safeguards against a return of the evils of the old order: there must be a strict supervision of all banking and credits and investments; there must be an end to speculation with other people's money, and there must be provision for an adequate but sound currency.

These are the lines of attack. I shall presently urge upon a new Congress in special session detailed measures for their fulfillment, and I shall seek the immediate assistance of the several States.

Through this program of action we address ourselves to putting our own national house in order and making income balance outgo.

Our international trade relations, though vastly important, are, to point in time and necessity, secondary to the establishment of a sound national economy.

I favor as a practical policy the putting of first things first. I shall spare no effort to restore world trade by international economic readjustment, but the emergency at home cannot wait on that accomplishment.

The basic thought that guides these specific means of national recovery is not narrowly nationalistic.

It is the insistence, as a first consideration, upon the interdependence of the various elements in and parts of the United States...a recognition of the old and permanently important manifestation of the American spirit of the pioneer.

It is the way to recovery. It is the immediate way. It is the strongest assurance that the recovery will endure.

In the field of world policy I would dedicate this nation to the policy of the good neighbor...the neighbor who resolutely respects himself and, because he does so, respects the rights of others...the neighbor who respects his obligations and respects the sanctity of his agreements in and with a world of neighbors.

If I read the temper of our people correctly, we now realize, as we have never realized before, our interdependence on each other: that we cannot merely take, but we must give as well, that if we are to go forward we must move as a trained and loyal army willing to sacrifice for the good of a common discipline, because, without such discipline, no progress is made, no leadership becomes effective.

We are, I know, ready and willing to submit our lives and property to such discipline because it makes possibly a leadership which aims at a larger good.

This I propose to offer, pledging that the larger purposes will bind upon us all as a sacred obligation with a unity of duty hitherto evoked only in time of armed strife.

With this pledge taken, I assume unhesitatingly the leadership of this great army of our people, dedicated to a disciplined attack upon our common problems.

Action in this image and to this end is feasible under the form of government which we have inherited from our ancestors.

Our Constitution is so simple and practical that it is possible always to meet extraordinary needs by changes in emphasis and arrangement without loss of essential form.

That is why our constitutional system has proved itself the most superbly enduring political mechanism the modern world has produced. It has met every stress of vast expansion of territory, of foreign wars, of bitter internal strife, of world relations.

It is to be hoped that the normal balance of executive and legislative authority may be wholly adequate to meet the unprecedented task before us.

But it may be that an unprecedented demand and need for undelayed action may call for temporary departure from that normal balance of public procedure.

I am prepared under my constitutional duty to recommend the measures that a stricken nation in the midst of a stricken world may require.

But in the event that the Congress shall fail to take one of these courses, and in the event that the national emergency is still critical, I shall not evade the clear course of duty that will then confront me.

I shall ask the Congress for the one remaining instrument to meet the crisis... broad executive power to wage a war against the emergency as great as the power that would be given to me if we were in fact invaded by a foreign foe.

For the trust reposed in me I will return the courage and the devotion that befit the time. I can do no less.

We face the arduous days that lie before us in the warm courage of national unity, with the clear consciousness of seeking old and precious moral values, with the clean satisfaction that comes from the stern performance of duty by old and young alike.

We aim at the assurance of a rounded and permanent national life.

We do not distrust the future of essential democracy.

The people of the United States have not failed. In their need they have registered a mandate that they want direct, vigorous action.

They have asked for discipline and direction under leadership. They have made me the present instrument of their wishes. In the spirit of the gift I will take it.

In this dedication of a nation we humbly ask the blessing of God. May He protect each and every one of us! May He guide me in the days to come!

## Appendix Two

### Legislative Changes 1930-1937

#### 1930 - 1932

- The Smoot-Hawley Tariff Act,<sup>253</sup> 1930
  - This act raised tariffs on over 20,000 goods.
- The Reconstruction Finance Act, 1932; created the Reconstruction Finance Corporation
  - Reconstruction Finance Corporation (RFC), 1932 -53; Established under Hoover during the Great Depression to give financial aid to both private firms and public organizations; the corporation was authorized to lend to banks, building and loan associations, agricultural credit corporations, mortgage companies, insurance companies, states and their political subdivisions, and other public agencies. In 22 years the RFC loaned more than \$12,000,000,000 - total funding dispersed from 1932 through 1941 was \$9.465 billion. The RFC was empowered to organize subsidiary companies; the RFC Mortgage Company was established in 1935. The Disaster Loan Corporation was organized in 1937 to aid persons affected by floods and other catastrophes. During World War II, through the Defense Plant Corporation, a subsidiary, the RFC was also authorized to make loans to enterprises essential to the war effort. The loans were nearly all repaid. RFC was abolished as an independent agency by act of Congress (1953) and was transferred to the Dept. of the Treasury to wind up its affairs, effective June, 1954; in 1953 the agency's functions were transferred to the Small Business Administration and other agencies.
- Federal Reserve Act, 1913; (during the Depression the Act was amended a number of times)
  - Section 13(3) of the Federal Reserve Act<sup>254</sup> This authority was added to the Federal Reserve Act in 1932 (July) and was intended to give the Federal Reserve the flexibility to respond to emergency conditions.
  - Glass-Steagall Act, 1932; temporarily permitted the Fed to use U.S. government securities to back its note issues (this authority was made permanent in 1933); the Federal Reserve Act (as amended in 1917) had required the Reserve Banks to maintain gold reserves equal to 40% of their note issues with the remaining 60% in form of either gold or "eligible paper" (e.g., commercial loans). The Act expanded the definition of "eligible paper" to include government securities.
    - Section 10B of the Federal Reserve Act (as amended in 1932) made formal the ability of the Fed to accept virtually any kind of collateral as part of its discount window lending.
  - Thomas Amendment to Agricultural Adjustment Act of 1933 permitted the Fed to adjust commercial bank reserve requirements; gave the President the authority to require open market purchases by the Fed, and to fix the weights of gold and silver dollars.
  - Section 7 of the Securities Act of '34 gives the Fed the authority to set margin requirements on securities.
  - Gold Reserve Act, 1934; authorized the transfer of monetary gold stock to the Treasury.
  - Silver Purchase Act, 1934; authorized limited Fed lending to industrial and commercial firms.
  - The Banking Act, 1935; expanded the Fed's authority to adjust reserve requirements; enhanced authority of the Board of Governors vis-à-vis the Federal Reserve Banks.
    - Reorganized the system of governance to create the FOMC and merged the offices of the chairman and governor to avoid conflicts.

<sup>253</sup> Legislation and Executive Orders are Underlined; Organizations/Initiatives are **Bold, Italic**

<sup>254</sup> Section 13(3) of the Federal Reserve Act authorizes the Federal Reserve Board to make secured loans to individuals, partnerships, or corporations in "unusual and exigent circumstances" and when the borrower is "unable to secure adequate credit accommodations from other banking institutions."

## 1<sup>st</sup> 100 Days (March - May 1933)

- The Emergency Banking Act, 1933; This measure called for a four-day mandatory shutdown of U.S. banks for inspections before they could be reopened. It provided for the reopening of banks after federal inspectors had declared them to be financially sound and it ratified the suspension of the gold standard instituted through executive order. The law also gave the Secretary of the Treasury the authority through an amendment to the Trading with the Enemy Act to confiscate the gold of private citizens, excluding dentists' and jewelers' gold and "rare and unusual" coins. These citizens received an equivalent amount of paper currency.
- The Economy Act for Purchasing Goods or Services, 1933; cut federal costs through cuts of veterans' pensions and reductions in government department budgets. Also permitted the federal government to purchase goods or services from other federal government agencies or major organizational units within the same agency.
- Beer-Wine Revenue Act, 1933; legalized and taxed wine and beer.
- Emergency Conservation Work Act (ECWA), 1933
  - Civilian Conservation Corps (CCC), 1933 - 1942; first created by Executive Order and later codified in ECWA was a public works project, operated under the control of the army, which was designed to promote environmental conservation while employing the young unemployed. Recruits planted trees, built wildlife shelters, stocked rivers and lakes with fish, and cleared beaches and campgrounds. Some 2.5 million young men were ultimately put to work on environmental projects.
- Federal Emergency Relief Act (FERA), 1933 -1935
  - Established the Federal Emergency Relief Administration (FERA) to distribute \$500 million to states and localities for relief or for wages on public works; FERA would eventually pay out approx. \$3 billion; FERA was the first of the New Deal's major relief operations. It provided assistance for the unemployed, supporting nearly five million households each month by funding work projects for more millions of mostly unskilled workers. It also provided vaccinations and literacy classes for millions who could not afford them; it was replaced by Works Progress Administration (WPA) in 1935.
  - Federal Surplus Relief Corporation, later changed to the Federal Surplus Commodities Corporation, 1933; one of the programs instituted under FERA; it helped farmers by buying up price-depressing surplus commodities from the open market; and it served as the agency through which these surplus commodities were made available to the state and local relief administrations for distribution to those in need of relief. It was continued as an agency under the Secretary of Agriculture and consolidated in 1940 with the Division of Marketing and Marketing Agreements into the Surplus Marketing Administration, and finally merged into the Agricultural Marketing Administration by Executive Order 9069 of February 23, 1942.
- Agricultural Adjustment Act (AAA), 1933; designed to help American farmers by stabilizing prices and limiting overproduction, the AAA initiated the first direct subsidies to farmers who did not plant crops; precursor to current Farm Bill. Through the AAA, farmers were paid to reduce their crops, either by plowing them under or by not cultivating a certain amount of acreage. The targeted commodities were wheat, cotton, corn, tobacco, rice, milk, and hogs (young livestock were slaughtered); the cost of the program was assumed by a tax on middlemen and food processors, such as grain elevator operators and meatpacking companies. By 1934, the production of several staple crops had decreased and farm prices, as well as farm income, rose accordingly; in 1935, the United States Supreme Court declared the tax paying for the program unconstitutional as an unnecessary invasion of private property rights. The AAA payments, however, were quickly reinstated without the "processing tax" under the Soil Conservation and Domestic Allotment Act, 1935.

- The Second AAA (1938) provided for the storage of surplus crops in government warehouses and made loans to farmers in years of overproduction to compensate for lower market prices.
- Tennessee Valley Authority Act (TVA), 1933; created the **Tennessee Valley Authority**; considered one of the more ambitious reform programs. It was created for the purpose of developing the Tennessee River watershed, revitalizing the seven-state region – one particularly hard hit by the Great Depression – by building 16 dams to control flooding, generate hydraulic power, and increase agricultural production. TVA provided jobs, low-cost housing, reforestation, and many other conservation-related services to the region; TVA brought electricity, flood control, and recreational facilities to seven comparatively impoverished states. Today, the TVA is still the largest public provider of electricity in the United States.

## 2<sup>nd</sup> 100 Days (June 1933)

- Joint Resolution to abandon the gold standard, 1933; abandoned the gold standard.
- National Employment System Act (June 6); created the U.S. Employment Service.
- Home Owners Refinancing Act, 1933; established the **Home Owner's Loan Corporation (HOLC)** to assist in the refinancing of homes. Between 1933 and 1935, one million people received long term loans through the agency.
- The Banking Act (better known as 2nd Glass-Steagall Act), 1933; it set forth stringent regulations for banks; it required the separation of investment and commercial banking functions – only 10% of a commercial bank's income could come from securities; empowered the Fed to regulate interest rates on demand and savings deposits (Regulation Q); provided bank depositors with insurance of up to \$5,000 through the newly formed **Federal Deposit Insurance Corporation (FDIC)**.
- The Farm Credit Act, 1933; provided refinancing of farm mortgages – refinanced about 20% of all farm mortgages in 18 months.
- **Farm Credit Agency (FCA)** , a Government-sponsored enterprise (GSE) overseeing the Farm Credit System – a network of borrower-owned lending institutions - and tasked with providing American agriculture with a dependable source of credit. Originally established in 1916 in response to farmer requests for liberal credit facilities and low interest rates, the FCA initially provided a system for mortgage credit through 12 regional farm land banks with most of the original capital supplied by the government. In 1932, the government invested \$125 million in the bonds of the farm land banks to bolster them and thus again became the majority stockholder. All then existing federal agricultural-credit organizations were unified into one agency, the FCA. Congress authorized that agency to extend the system of farm-mortgage credit. Funds were made available for loans on easy terms for first or second mortgages to debtors whose collateral was so low in value or so encumbered by debt as to make refinancing by the land banks unfeasible. In 1933, the FCA was also authorized to establish 12 production credit corporations and banks for cooperatives. The result was a centralized source of farm credit. A part of the Dept. of Agriculture after 1939, the FCA again became an independent agency in 1953 supervising the Farm Credit System for American agriculture.
- Emergency Railroad Transportation Act, 1933; increased federal regulation of railroads.
- National Industrial Recovery Act (NIRA), 1933;
  - Established the **National Recovery Administration (NRA)** to stimulate production through curtailed competition and having American industries set up a series of codes designed to regulate prices, industrial output, and general trade practices. The federal government, in turn,

would agree to enforce these codes. In return for their cooperation, federal officials promised to suspend anti-trust legislation. Portions of the NIRA were ruled unconstitutional by the Supreme Court in 1935 because it violated the separation of powers clause; however, the **Works Progress Administration (WPA)**, which was the second part of the NIRA, was allowed to stand. The majority of NIRA's collective bargaining stipulations survived in two subsequent bills: Section 7A of the NIRA recognized the rights of labor to organize and to have collective bargaining, and the labor provisions of the fair-competition codes established the 40-hour week, set a minimum weekly wage, and prohibited child labor under the age of 16; NIRA also earmarked \$3.3 billion for public works through the **Public Works Administration (PWA)**.

- **Public Works Administration (PWA)**, 1933 - 1941; the PWA created public works as economic stimulus and continued until the U.S. ramped up wartime production for World War II; received a \$3.3 billion appropriation; built large public works projects; used private contractors (did not directly hire unemployed); PWA's efforts mostly focused on permanent projects, including the first federal housing program, support for public power through reclamation projects in the West, and a range of public improvements from bridges to lighthouses.
- **Commodity Credit Corporation**, 1933; created by Executive Order 6340, was a government-owned and operated entity designed to provide loans, make purchases and perform other actions to ensure farmers were paid higher prices and ultimately the continual distribution of agricultural commodities.
- Securities Acts of 1933 ("Truth in Securities Act") & 1934; the '33 Act required that any offer or sale of securities using the means and instrumentalities of interstate commerce be registered pursuant to the 1933 Act; codified standards for sale and purchase of stock and required risk of investments to be accurately disclosed;
  - The '34 Act created the **Securities and Exchange Commission (SEC)** in 1934, as an independent agency; the SEC was created primarily to restore the stability of the stock market after the crash of October 1929 and to prevent corporate abuses relating to the offering and sale of securities.
- **Puerto Rico Reconstruction Administration**, 1933; was established by Executive Order 7057 with the purpose of providing relief and reconstruction for Puerto Rico.
- **Civil Works Administration (CWA)**, 1933-34; created under the auspices of the Federal Emergency Relief Act, the CWA was to create temporary jobs for millions of unemployed; its focus on high paying jobs in the construction arena resulted in a much greater expense to the federal government than originally anticipated; it provided construction jobs for more than four million people who were paid \$15 per week to work on schools, roads, and sewers; the CWA ended in 1934 in large part due to opposition to its cost.

## 1934 - 1940

- Communications Act, 1934:
  - Established the **Federal Communications Commission (FCC)** as the successor to the Federal Radio Commission; its function was to merge the administrative responsibilities for regulating broadcasting and wire communications into one centralized agency; today, this independent, quasi-judicial agency is charged with the regulation of all nonfederal governmental use of radio and television broadcasting and all interstate telecommunications (wire, satellite, and cable), as well as all international communications that originate or terminate in the United States.
- Indian Reorganization Act, 1934; returned lands of American Indians to self-government and provided a "sound economic foundation" to their communities

- The Gold Reserve Act, 1934; abrogated the gold clause in government and private contracts and changed the value of the dollar in gold from \$20.67 to \$35 per ounce; authorized the transfer of monetary gold stock to the U.S. Treasury.
- The Silver Purchase Act, 1934; provided for the nationalization of domestic stocks of silver and for the purchase of silver by the Treasury until the price should reach \$1.2929 per ounce or the value of the amount held should equal one-third of the value of the government's gold holdings.
- National Housing Act (NHA), 1934;
  - It established the **Federal Housing Administration (FHA)**, an agency targeted at combating the housing crisis of the Great Depression; this program focused on stimulating the growth of the building industry through provisioning of federal mortgage insurance for low-income borrowers; helped advance the concept of long-term amortized mortgages.
- Reciprocal Trade Agreement Act, 1934; permitted a series of tariff reduction agreements with key trading partners, such Canada, the U.K., and others.
- Resettlement Administration, 1935; was a relief organization created by Executive Order 7027 that provided assistance to poor farmers and sharecroppers. The RA was a precursor to the **Farm Security Administration**.
- Farm Security Administration (FSA), 1937; created under the authority provided by the aforementioned Federal Emergency Relief Act, the FSA was a relief organization directed at improving the lot of the poor farmers and sharecroppers. The FSA established temporary housing for Dust Bowl refugees from Oklahoma and Arkansas who had migrated to California in hopes of finding employment; in total, the FSA loaned more than a billion dollars to farmers and set up many camps for destitute migrant workers.
- Revenue Act, or "Wealth Tax Act," 1935; the Act raised tax rates on incomes above \$50,000. The Act did little to increase federal tax revenue, and it did not significantly redistribute income.
- Social Security Act, 1935; established the **Social Security Administration (SSA)**. The SSA was designed to combat the widespread poverty among senior citizens; it administers a national pension fund for retired persons, an unemployment insurance system, and a public assistance program for dependent mothers, children, and the physically disabled. Paid for by employee and employer payroll contributions; required years of contributions, so first payouts were in 1942.
- Emergency Relief Appropriations Act (ERF), 1935; appropriated nearly \$5 billion to create some 3.5 million jobs.
  - Works Progress Administration, 1935 – 1939 & (renamed) Works Project Administration (WPA), 1939-1943 was funded by the ERF – created by Executive Order; it was the largest New Deal agency established to provide work for the unemployed. Between 1935 and 1941, the WPA employed an average of two million people a year mostly working on construction work, also sewing projects for women and arts projects for unemployed artists, musicians and writers. WPA went on to spent some \$11 billion on reforestation, flood control, rural electrification, water works, sewage plants, school buildings, slum clearance, student scholarships, and other projects, e.g., the Bonneville Dam on the Columbia in 1937. In total, the WPA came to employ more than eight million people; WPA workers built 650,000 miles of roads; constructed, repaired or improved 124,000 bridges, 125,000 public buildings, and 700 miles of airport runways; under the arts program, many artists, photographers, writers, and actors became government employees, working on a myriad of public projects ranging from painting murals to writing national park guidebooks.
    - Federal Art Project, 1935

- Federal Music Project, 1935
  - Federal Theatre Project, 1935
  - Federal Writers' Project, 1935
  - National Youth Administration, 1935
- National Labor Relations Act (NLRA) / (also known as) Wagner Act, 1935; allowed workers to join unions and outlawed union-busting tactics by management. Employees were guaranteed the right to negotiate with employers through unions of their choosing. It established the **National Labor Relations Board (NLRB)** as a forum for dispute resolution.
- **Rural Electrification Administration (REA), 1935**;
  - Rural Electrification Act, 1936; codified the existing agency (REA) created by an executive order. The purpose behind the agency and the Act was to supply electricity to rural communities. Before the New Deal, only 10% of areas outside cities had electricity; the Agency granted low-cost loans to farm cooperatives to bring electric power into their communities. By 1940, only 40% of American farms were electrified.
- **National Youth Administration, 1935**; established by the Federal Emergency Relief Act (FERA), 1933; provided part-time employment/work-study jobs to more than two million college and high school students.
- **Judicial Reorganization Bill (known as Court-packing Bill), 1937**; the bill sought to empower the President with the appointment of a new Supreme Court judge for every judge 70 years or older; failed to pass Congress.
- **The Housing Act, 1937**; established the **United States Housing Authority**. It authorized the lending of money to states and local communities for low-cost housing.
- **Civil Aeronautics Act, 1938**; transferred federal civil aviation responsibilities from the Commerce Department to the CAA
  - **Civilian Aeronautics Authority (CAA)** (now **Federal Aviation Administration**)
- **Fair Labor Standards Act/The Wages and Hours Act, 1938**; this labor law was the last major piece of New Deal legislation intended to reform the economy. This law established the minimum wage (at the time 25 cents/hr.); it also set the standard for the 40-hour work week - originally set at 44 hrs/wk. - and banned the use of child labor (under age of 16 and restricted those under 18 to non-hazardous work).
- **Reorganization Act of 1939/Federal Security Agency, 1939 - 1953**; the Act authorized the President to devise a plan to reorganize the executive branch of government; this cabinet level agency had the responsibility for several government entities. Until it was abolished in 1953, it administered the Social Security Board, the U.S. Public Health Service, Food and Drug Administration, the Civilian Conservation Corps, the Office of Education, the National Youth Administration and a number of other agencies.

# Weimar Republic Deleveraging 1920s

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This document provides a timeline of Germany's Weimar Republic during the years from 1914 through 1924. Both German industrial production and the German stock market peaked around the start of World War I in 1914. It wasn't until 1927 that the economy reached its 1914 level and not until around 1960 that real stock market prices returned to their 1914 peak.<sup>255</sup> Within this long period of inflationary deleveraging is one of the most acute periods of inflationary deleveraging ever, which occurred in 1922–1923. This is a period of special interest and focus to us because of the perspective it provides. As with other cases, I want to convey market movements as well as notable historical developments, especially the very large market whipsaws that accompanied the near total destruction of financial wealth during this time.

The timeline is divided into four periods. These periods were selected to represent distinct phases in the depreciation of the mark. When possible, events are arranged chronologically within each of the phases.

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| World War I Period: 1914 - Nov 1918   | pg. 119 |
| Post-War Period: Nov 1918 - Dec 1921<br>1918<br>1919-1920<br>1921   | pg. 122 |
| Hyperinflation: Jan 1922 - Nov 1923<br><i>First Half of 1922: The Transition to Hyperinflation</i><br><i>Second half of 1922</i><br><i>1923: The Occupation of the Ruhr &amp; Final Stages of the Inflation</i> | pg. 133 |
| Stabilization: From Late 1923 Onward  | pg. 147 |

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This timeline uses information from the following sources:

| Books                                     |   | Data  |
|---|---|---|
| Author                                    | Title   | Provider                                    |
| Anton Kaes, Martin Jay, Edward Dimendberg | The Weimar Republic Sourcebook  | National Bureau of Economic Research (NBER) |
| Carl-Ludwig Holtfrerich                   | The German Inflation: 1914-1923   | Reichsbank Statements                       |
| Charles P. Kindleberger                   | A Financial History of Western Europe   | Sveriges Riksbank (Central Bank of Sweden)  |
| Constantino Bresciani-Turroni             | The Economics of Inflation: A Study of Currency Depreciation In Post War Germany      | Global Financial Data                       |
| Detlev J.K. Peukert                       | The Weimar Republic   |   |
| Deutsche Bundesbank                       | Deutches Geld-und Bankwesen in Zahlen 1876-1975                                       |   |
| Frank D. Graham                           | Exchange, Prices, and Production in Hyper-Inflation, 1920-1923                        |   |
| Niall Ferguson                            | Paper & Iron: Hamburg business and German politics in the Era of Inflation, 1897-1927 |   |
| Peter L. Bernstein                        | The Power of Gold: The History of an Obsession  |   |
| Theo Balderston                           | Economics and Politics in the Weimar Republic   |   |
| Charles P. Kindleberger                   | Manias, Panics, and Crashes: A History of Financial Crises                            |   |
| Barry Eichengreen                         | Golden Fetters: The Gold Standard and the Great Depression 1919-1939                  |   |

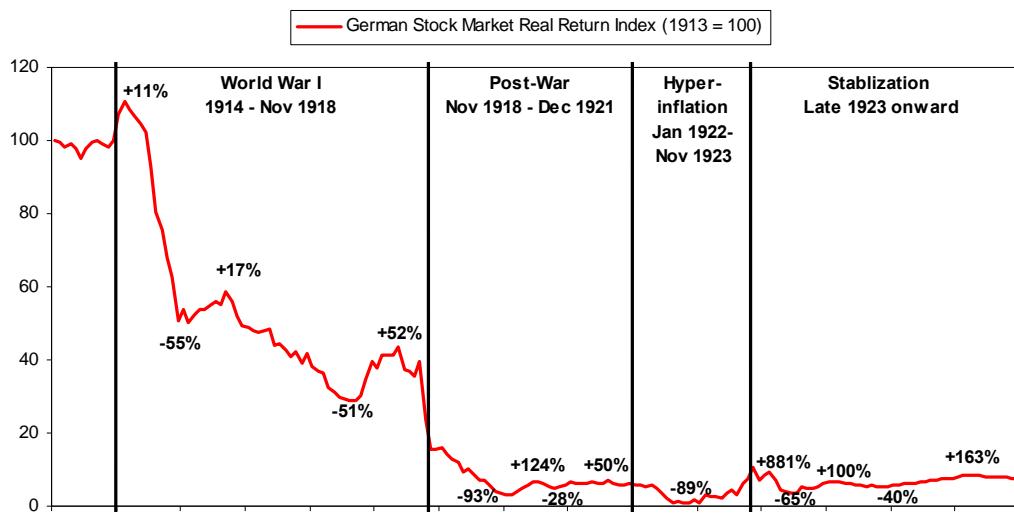
<sup>255</sup> Estimates of the real returns of stocks are imprecise because of distortions arising from extraordinarily high and unreliable inflation data.

## Overview

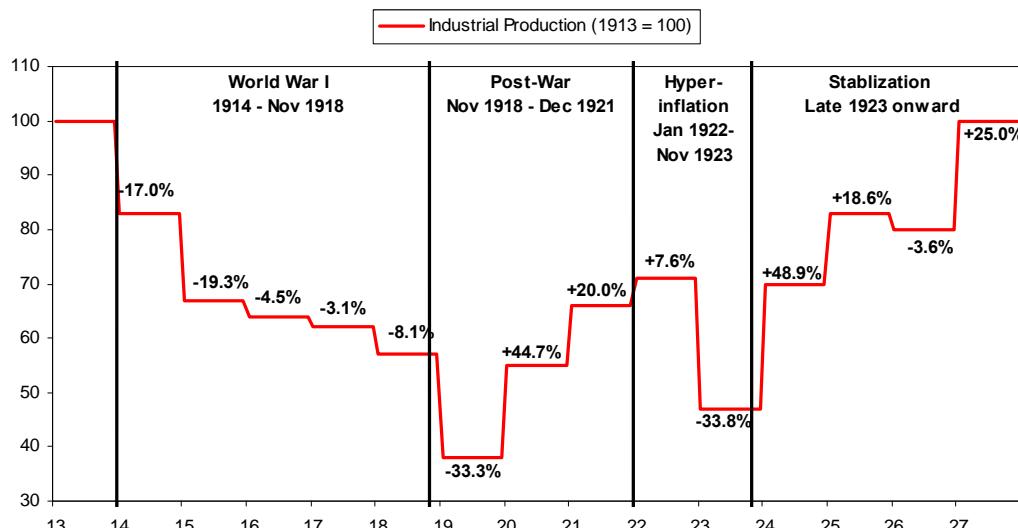
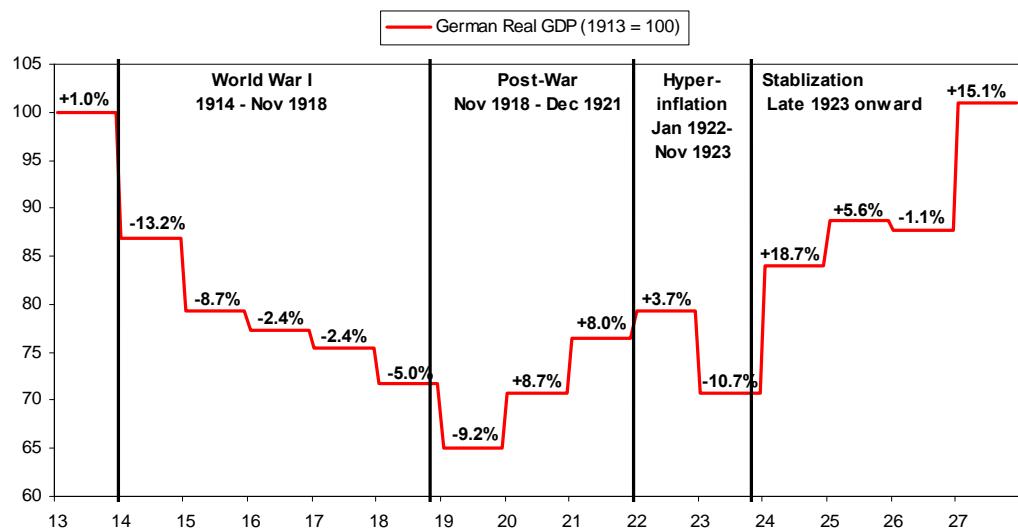
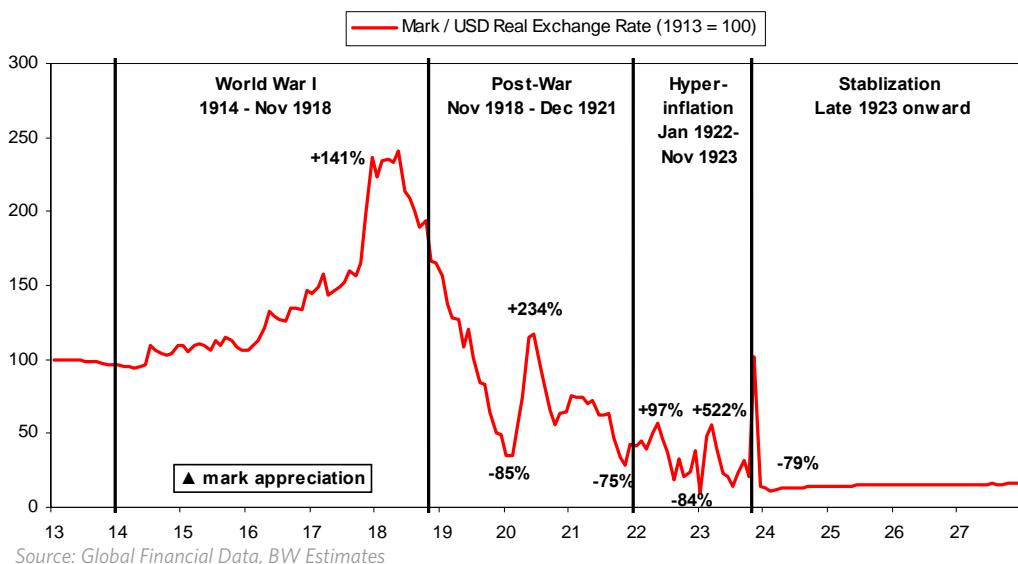
Depressions arise when (a) debt service obligations become unsustainably large in relation to the cash flows to service them, (b) investors seek to convert a large amount of financial assets into cash, and (c) monetary policy is ineffective. Because monetary policy is ineffective in creating credit, credit creation turns into credit contraction until this fundamental imbalance between the need for cash and the amount of cash available is rectified. Until the fundamental imbalance is rectified, a cash shortage causes debt and liquidity problems. This cash shortage, and these liquidity problems, cause financial assets to be sold for cash (i.e., M0), which worsens the cash shortage and puts the central bank in the position of having to choose between (a) keeping the amount of money the same and allowing the shortage of cash to become more acute, thus driving up interest rates and causing the credit crisis to worsen, and (b) printing more money, thus depreciating its value. The Weimar Republic case study, like the 1980s Latin America case study, is interesting in examining the dynamic behind the process of alleviating the fundamental imbalance primarily through the creation of cash (i.e., M0)

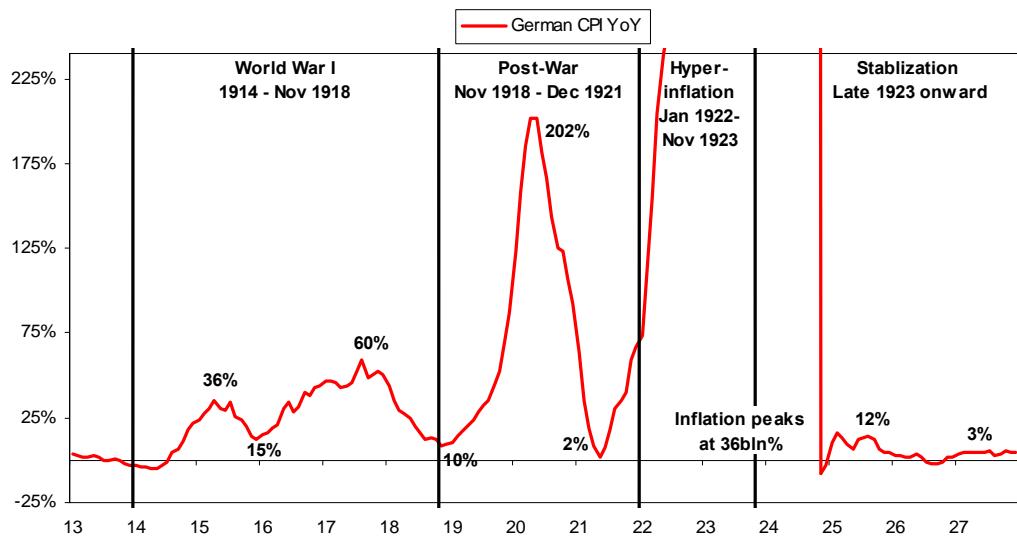
As with the other cases of deleveraging, in this case, there were many swings in markets and economic conditions so, from the perspective of someone trying to navigate through this period, it is important to understand these swings and see the cause-effect relationships behind them.

To help to convey the big picture before I get into the chronology, I want to show a few charts of the total timeframe. The ones that follow show the real stock market, the real exchange rate, real economic activity, and the inflation rate from 1913–1927, with the vertical lines designating the beginnings of each of the four phases referred to in the table of contents. The percentages noted in each chart are meant to convey the very big swings along the way. It is very important for us to understand what caused these swings and to visualize how our game plan would have navigated these. The chronology that follows will explain these movements.



Source: Global Financial Data, BW Estimates





In order to gain a big picture perspective, it is also important to view Germany's deleveraging within the context of the world economy at the time. To convey this, the table below shows industrial production (a proxy for economic activity) for Germany, France, the UK, and the US. Note that (a) Germany's economic activity plunged more severely than other economies after the war, (b) the German economy grew, while the UK and France contracted in 1921, and (c) the German economy plunged while the UK and France grew in 1923. You will also note the recovery that followed the post-war deleveraging and that occurred in 1920-22, and that it was followed by the very classic inflationary deleveraging that occurred in 1922-1923. The reasons will also be made clear in the chronology.

**Indices of Industrial Production**

|             | Germany | United States | Great Britain | France |
|-------------|---------|---------------|---------------|--------|
| <b>1913</b> | 100     | 100           | 100           | 100    |
| <b>1914</b> | 83      | 92            | 93            | 64     |
| <b>1915</b> | 67      | 103           | 94            | 37     |
| <b>1916</b> | 64      | 122           | 87            | 45     |
| <b>1917</b> | 62      | 123           | 84            | 57     |
| <b>1918</b> | 57      | 121           | 79            | 52     |
| <b>1919</b> | 38      | 119           | 89            | 57     |
| <b>1920</b> | 55      | 126           | 91            | 62     |
| <b>1921</b> | 66      | 97            | 62            | 55     |
| <b>1922</b> | 71      | 129           | 77            | 78     |
| <b>1923</b> | 47      | 153           | 83            | 88     |
| <b>1924</b> | 70      | 141           | 89            | 109    |
| <b>1925</b> | 83      | 158           | 87            | 108    |
| <b>1926</b> | 80      | 161           | 77            | 126    |
| <b>1927</b> | 100     | 157           | 99            | 110    |
| <b>1928</b> | 102     | 163           | 95            | 127    |
| <b>1929</b> | 103     | 174           | 104           | 140    |
| <b>1930</b> | 91      | 138           | 98            | 140    |
| <b>1931</b> | 73      | 137           | 88            | 124    |

## World War I Period

1914 - November 1918

World War I began in 1914 and ended in November 1918. It set the stage for the period that we will be examining because it resulted in Germany having very large domestic and foreign debts. During the war years, Germany spent a lot of money on the war, much of which was financed by borrowing from its people; it then lost the war and acquired a huge foreign debt in the form of war reparations. While Germany's deleveraging was largely a consequence of the debts arising from the war, deleveragings are debt crises, regardless of their causes, so the fact that Germany's arose from the war is essentially irrelevant to our examination of the inflationary deleveraging dynamic.<sup>256</sup>

As with most countries at the time, Germany was on the gold standard at the beginning of the war – i.e., to borrow money, it guaranteed the value of the money by promising to convert money into gold. When it was unable to meet those commitments it defaulted – i.e., it broke its promise to allow holders of currency to convert it to gold.<sup>257</sup>

For Germany default came on August 4, 1914 when the Reichsbank (Germany's central bank) "suspended" the conversion of money for gold. As with all other countries' suspensions of gold convertibility, this default occurred because investors exercised their right to turn their money into gold in large numbers, which caused the government's gold reserves to fall a lot, so that it became obvious that the central bank would not have enough gold to fulfill its commitment. Whenever (a) the amount of money in circulation is much greater than the amount of gold held in reserves to back the money at the designated price of conversion, and (b) investors are converting money into gold because they are worried about the value of their money, the central bank is in the untenable position of having to either reduce the supply of money in circulation (i.e., tighten credit) or to end convertibility and print more money. Central banks almost always choose suspending convertibility and printing more money. Such was the case in mid-August 1914 in Germany. At that time, the Reichsbank chose to break its promise to deliver gold so that it could freely print money. On the same date, another law passed that authorized the Reichsbank to discount short-term bills issued by the Treasury and to use them, together with commercial bills, as collateral for its notes. So also, on August 4 the central bank decided to free itself from all constraints that limited its ability to print money and simultaneously initiate money printing activities. According to the weekly statements of the Reichsbank, in the two weeks from July 24 to August 7, the quantity of the Reichsbank notes in circulation increased by more than two billion marks,<sup>258</sup> an increase of approximately 30%. Knowing that this move would lead to inflation, on the same date (August 4), a "Law Concerning Maximum Prices," which imposed price controls and a freeze in rents,<sup>259</sup> was also passed by the Reichstag. Nonetheless, as a result of this decision to eliminate constraints on money production, currency and credit inflation began in Germany directly after the outbreak of the war.

Before 1914 gold coins represented about 40% of the monetary base, but they were withdrawn from circulation by the Reichsbank after the outbreak of war. The Reichsbank's gold reserves amounted to 1,253 million marks on July 31, 1914. Because the central bank took the private gold into its possession (i.e., because the government essentially confiscated the gold from private investors), at the end of 1918, the Reichsbank had 2,262 million marks in gold –i.e., its gold reserves had nearly doubled.<sup>260</sup>

These moves—i.e., eliminating the link between currency and gold, printing a lot of money to buy government debt, and establishing price controls—are classic ingredients of reflation. In all cases, they are accompanied by currency devaluations and gold revaluations. They are frequently accompanied by the government outlawing gold and the government taking it into its possession. Often these moves are accompanied by foreign exchange

<sup>256</sup> Bresciani-Turroni p. 23

<sup>257</sup> Bresciani-Turroni p. 23

<sup>258</sup> Bresciani-Turroni p. 23

<sup>259</sup> Holtfrerich p. 79

<sup>260</sup> Bresciani-Turroni p. 28

controls. The last time this mix of policies was deployed in the U.S. was in 1971. These things happened in Germany in 1914.

The printing of money was primarily to fund the government's deficits and alleviate other debt burdens. The table below shows, in millions marks, the total income, expenditure and budget deficit of the German Reich during the years 1914–1918. As conveyed, in these war years, the amounts of money spent and the deficits increased a lot.

#### **German Reich Income and Expenditure**

| Millions of marks |                        | %GDP                              |                |                        |                                   |             |
|-------------------|------------------------|-----------------------------------|----------------|------------------------|-----------------------------------|-------------|
| Financial Years   | Government Expenditure | Ordinary and Extraordinary Income | Deficit        | Government Expenditure | Ordinary and Extraordinary Income | Deficit     |
| 1914              | 9,651                  | 8,149                             | -1,502         | 17%                    | 14%                               | -3%         |
| 1915              | 26,689                 | 23,207                            | -3,482         | 47%                    | 41%                               | -6%         |
| 1916              | 28,780                 | 22,815                            | -5,965         | 36%                    | 29%                               | -7%         |
| 1917              | 53,261                 | 35,215                            | -18,046        | 45%                    | 30%                               | -15%        |
| 1918              | 45,514                 | 31,590                            | -13,924        | 37%                    | 26%                               | -11%        |
| <b>Total</b>      | <b>163,894</b>         | <b>120,976</b>                    | <b>-42,918</b> | <b>38%</b>             | <b>28%</b>                        | <b>-10%</b> |

The difference between the total expenditure and the total income was covered by issuing Treasury bills that were bought by the Reichsbank, which directly increased the currency in circulation,<sup>261</sup> fueling inflation. Naturally, investors worried about the depreciating value of their money ran to gold, essentially the only non-credit based money, so gold was outlawed.

The debt that the German government issued to finance the war was primarily floating debt because investors had become wary about lending the government money in exchange for longer maturity debt,<sup>262</sup> fearing that they would be paid back with depreciated money. These fears were learned, arising from investors who had held long-term bonds being burned. The issuing of floating debt required the government to print more money faster in order to pay off these short-term debts in depreciated rather than hard money, which drove depositors into even shorter term money, and so on, until in the autumn of 1916 investors became wary about lending, even short term, so the sums yielded by the loans were always less than the amounts of the floating debt.

After the outbreak of the war, the publication of war statistics stopped. They were only renewed in 1920.<sup>263</sup> As a result, data for this period is sparse.

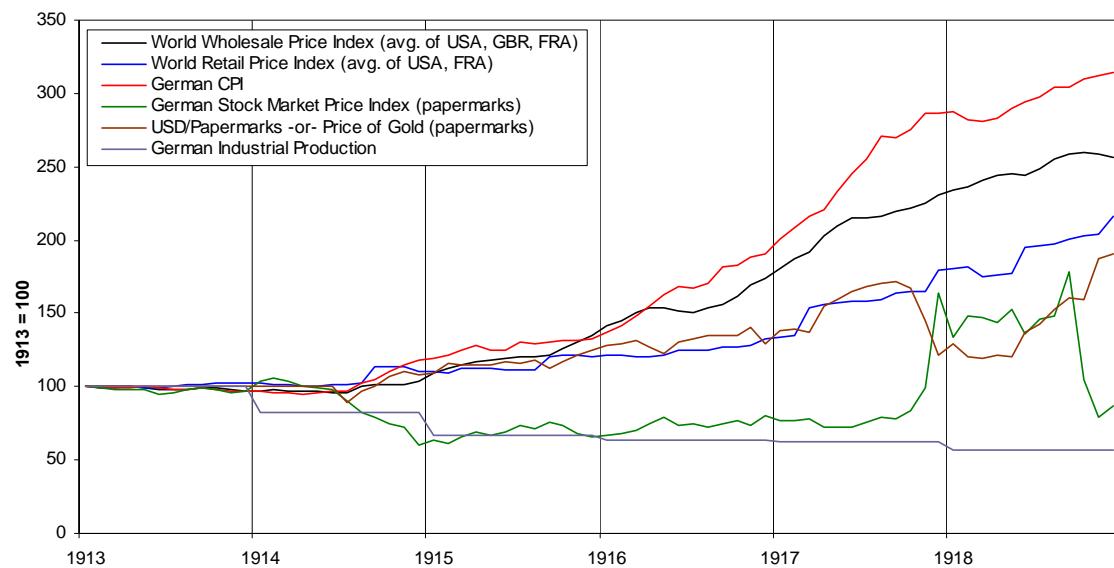
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<sup>261</sup> Bresciani-Turroni p. 48

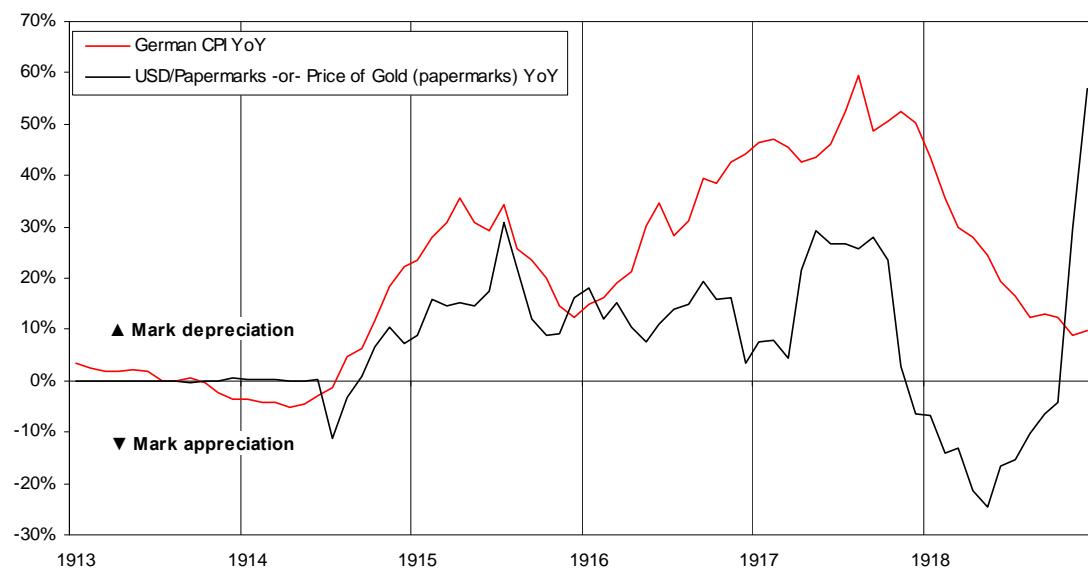
<sup>262</sup> Bresciani-Turroni p. 48

<sup>263</sup> BT 227

As shown below, (a) this was a period of rising prices globally, (b) the rates of inflation in Germany outpaced those in other countries and rose at steadily increasing rates through 1918, and (c) the stock market fell by 38% in nominal terms and 46% in real terms in 1914.



Source: Global Financial Data, BW Estimates



Source: Global Financial Data, BW Estimates

## Post-War Period

### November 1918 - December 1921

#### 1918

Germany lost the war, so naturally stocks plunged and there was capital flight from Germany's paper. As a result, the mark plunged from November 1918 to July 1919<sup>264</sup> and the debt soared. From the end of October 1918 to the end of March 1919, the floating debt of the Reich rose by 15.6 billion paper marks,<sup>265</sup> an increase of 32%. In contrast with the war years, the mark's depreciation occurred via the dollar exchange rate as the dollar became the world's most important currency. As a result of this depreciation, prices of imported goods rose more rapidly than prices of domestic goods. From November 1918 until July 1919, M0 grew at an annualized rate of 102%, the price of gold in paper marks increased by 210%, the inflation rate averaged an annualized 48%, and industrial production fell at an annualized rate of 43%.

The signing the Treaty of Versailles on June 28, 1919 triggered a new plunge in the exchange rate as it then became obvious the debts imposed on Germany by the Treaty would have a devastating effect on Germany's balance of payments<sup>266</sup> for years to come. At this point, Germany was saddled with a very large domestic debt and a large foreign debt.

While from October 1918 through early 1919, share prices fell a lot, in the second half of 1919 they rose a lot in paper mark terms due to the very rapid depreciation of the mark. This was the beginning of the very classic dynamic of rapid depreciations in the value of money causing illusions of price gains of stocks and tangible assets. In the case of Germany's stock market, at the time, the rise was much less than the currency's depreciation and less than the rise in the price of gold (which reflects the value of money), stocks were a disastrous investment. The indexed value of stocks in gold terms fell from 69.3 in October 1918 to 8.5 in February 1920. Similarly, in inflation adjusted terms, stocks were a horrible investment, i.e., in February 1920, real share prices had fallen to only about 12 percent of their 1913 value.<sup>267</sup> Similarly, from a foreign investor's perspective, investing in Germany's stock market was a losing proposition. So, during this time gold was the preferred asset to hold, shares were a disaster even though they rose, bonds were wiped out, and rent controls made real estate very bad. In other words, the market action was clearly consistent with that of an inflationary deleveraging.

The end of World War I brought economic problems to almost everyone. As is typical of deleveragings, economic problems brought clashes between capitalists, "the haves," and the proletariat, "the have-nots," and these clashes caused big political shifts. These clashes were not confined to Germany—they were global. For example, the Russian Revolution occurred in November 1918, where the proletariat took wealth and power from the capitalists.<sup>268</sup>

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<sup>264</sup> Bresciani-Turroni p. 28

<sup>265</sup> Bresciani-Turroni p. 53

<sup>266</sup> Bresciani-Turroni p. 54

<sup>267</sup> Bresciani-Turroni p. 256-7

<sup>268</sup> Bresciani-Turroni p. 302-320

## 1919 - 1920

In 1919, the German government (i.e., the Reich) found it impossible to raise the money it needed without continuing to issue new floating debt at an accelerating rate. The revenues of the Reich had only a modest increase so this revenue increase didn't do much to reduce their overwhelming reliance on deficit financing, which was then forced to be almost exclusively through short-term borrowing.<sup>269</sup> At times when governments need more money than they can borrow from foreign investors, (i.e., when the economy is depressed and budget deficits are large), they are faced with the choice of directly taxing the rich (who are the only ones who can afford to "contribute") or indirectly taxing them by printing money which devalues the claims of debt holders. They typically do both. Germany did both.

Big taxes of various forms were enacted. Specifically:

(1) In 1919 and 1920 numerous new laws were put into place to create numerous and complex taxes. In fact, Matthias Erzberger, the finance minister at the time, proclaimed that in the future Germany the rich should be no more.<sup>270</sup>

(2) In December 1919 the government passed the "War Levy on Capital Gains" and the "Extraordinary War Levy for Fiscal Year 1919," creating wealth taxes that were strongly progressive, rising from 10% of the value of assets at five thousand marks to 65% at above seven million marks. According to original estimates, the tax was expected to take up to one third of German national wealth, which would then be used to redeem the state's war debts. However, since the tax was for the most part payable in cash and those who were taxed couldn't convert their wealth into cash fast enough, the Reich had no choice but to permit payment by installment. In fact in some cases it could be spread over up to 28 ½ years, or in the case of landed property up to forty-seven years.<sup>271</sup> The government treated these tax debts as mortgages.

(3) The Secretary of the State proposed that the taxes due should take the form of mortgages denominated in gold in favor of the State and should be imposed on all properties, though interest payments could be made in paper money that was price indexed (e.g., for farmers they were indexed to grain prices). However, when it came to paying its debts, the government did so in paper money that could depreciate. Clearly, the government was allowing itself, but not the taxpayers, to depreciate its debts through money creation. As an additional wealth tax, the government proposed that a certain percentage of the equity of public and private companies should be given to the State.<sup>272</sup>

(4) The "Reich Emergency Contribution" taxed the wealthier classes as part of the great Erzberger tax reforms. It was also payable in installments, which was contrary to the original conception, so it became a recurrent charge on wealth in addition to wealth holders' existing liabilities under the "Defense Contribution" of 1919 and the extraordinary "War Levy" of 1917.<sup>273</sup> Because of inflation and the method of valuing real property and industrial plants, those who owned securities or mortgages (i.e., financial assets) were worse off than landowners and industrialists (i.e., owners of tangible assets).

At the time, economists recognized that the claims of those who held financial assets were too large to be paid back in the promised manner (i.e., with the value of money being maintained) without resulting in great hardship. So, rather than wanting to fight inflation, policy makers explicitly advocated accelerated inflation as a means of taxation. The plan was for the Reich to redeem its long-term debt prematurely at par value by obtaining the cash from the central bank, or to convert its long-dated bonds into treasury bills. This would eliminate the threat of the government going bankrupt. Also, it was widely recognized that depreciating the currency would have

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<sup>269</sup> Holtfrerich p. 129

<sup>270</sup> Bresciani-Turroni p. 55

<sup>271</sup> Holtfrerich p. 134

<sup>272</sup> Bresciani-Turroni p. 57

<sup>273</sup> Holtfrerich p. 128-9

stimulative effects on the economy and make Germany more competitive in world markets. As one official put it, it was better "to exploit to the full the opportunities afforded by money creation, than to cripple the forces of production and the spirit of enterprise by a confiscatory tax policy."<sup>274</sup>

It was widely recognized that, though breaking the commitment to pay debts in money of stable value is evil, it is the lesser of two evils. For example, a German economist at the time, Dr. Bendixen, who favored printing money to devalue debtors' claims said, "I have never denied that what I propose is an evil, but it is the only means of preventing a still worse evil...We may deprecate the fraudulent excesses of speculation and of entrepreneurial activity that the inflation would bring—and not without reason: but are we on this account to prefer the corpse-strewn battlefield into which the repudiation of the War Loans would turn our economy?" Bendixen believed it would be impossible, or at least extremely injurious to the economy, to repay the War Loans out of taxation. He also regarded inflation as preferable to the type of tax system that—under existing political conditions—was threatening wealth holders and high income groups in the manner proposed. Similarly, Keynes said, "The inflation is unjust and deflation is inexpedient. Of the two perhaps deflation is the worse, because it is worse in an impoverished world to provoke unemployment than to disappoint the rentier."<sup>275</sup> By "rentier" he meant the person who rented out his capital.

Germany's total debt—i.e., its external debt on top of its internal debt—was so huge that it must have been obvious to anyone with a sharp pencil that any attempt to service it, let alone to pay it off, would have caused a deflationary deleveraging of unimaginable severity, so it was not going to happen. No government could have survived such a policy. When there isn't much chance that the government can service or pay back its debt via taxation there is always an implicit risk that it will print currency and depreciate the currency's value. This is not just an observation of Germany at the time—it is a timeless and universal truth.<sup>276</sup>

In contrast with the easy money policies that existed in Germany at the time, tight money policies were being followed in other countries because, at the end of 1919 and beginning of 1920, Britain and the USA were in booms that had to be brought under control. For example, interest rates on three-month money, which were less than 6% in the first nine months of 1919, averaged about 8% in 1920 in the U.S.

Naturally, high tax rates on the wealthy coming at the same time as their net worths were being eroded in their investments and due to the bad economy, caused them to desperately try to preserve their rapidly shrinking wealth at all costs. This led to extremely high rates of tax evasion and the flight of capital abroad.<sup>277</sup> This is typical in deleveragings. It also typically leads to governments establishing controls on both tax evasion and citizens of the country taking money abroad. As we will see shortly, that is what happened in Germany.

At the time, the Allies (i.e., the countries that won the war) were understandably worried that Germany would pay them back with worthless paper money, so on December 13, 1919, they reached an agreement with Germany that forbid the Reichsbank from disposing of its gold reserve.<sup>278</sup> As we will see later, this gold stock was to play an important role in determining how events transpired in subsequent years.

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<sup>274</sup> Holtfrerich p. 132-3

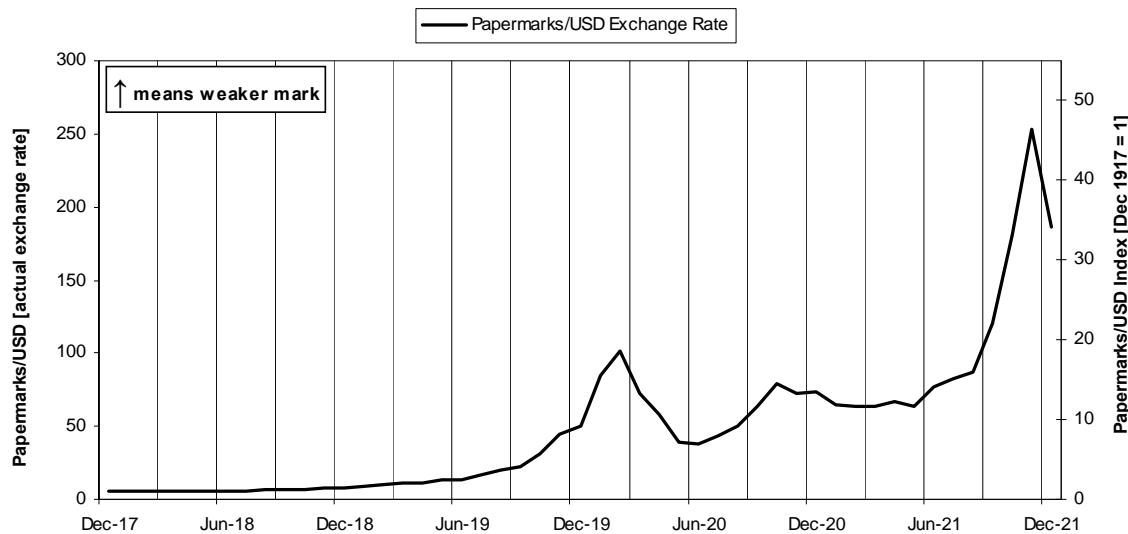
<sup>275</sup> Holtfrerich p. 132-3

<sup>276</sup> Holtfrerich p. 129

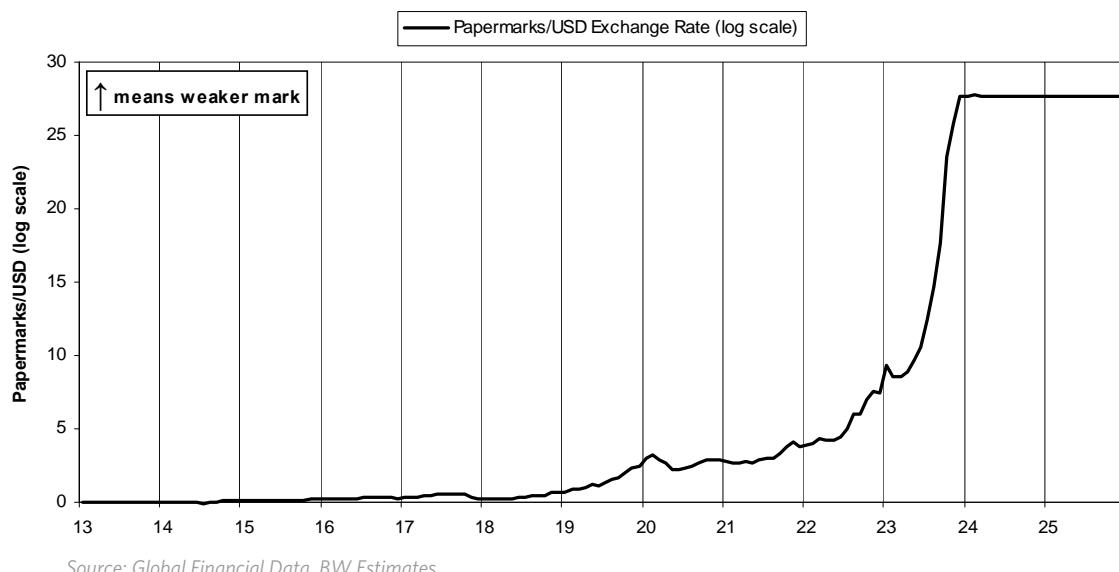
<sup>277</sup> Holtfrerich p. 208

<sup>278</sup> Bresciani-Turroni p. 52

The charts below show the exchange rate changes during this period and a longer-term chart to put these moves in context. As shown, this was a period of great weakness in the mark, which is obviously consistent with the fundamentals of the time.



Source: Global Financial Data, BW Estimates



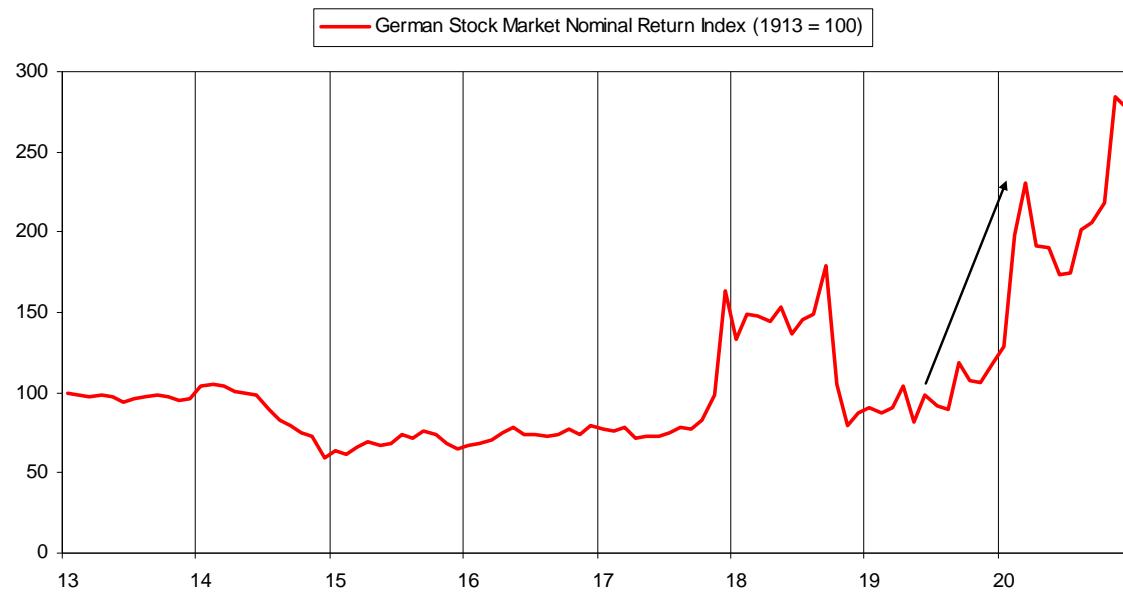
Source: Global Financial Data, BW Estimates

Currency depreciation is, in cases other than hyperinflation, normally stimulative to short-term economic activity and bullish for inflation hedge assets and stocks. So, these declines in the mark stimulated the German economy in late 1919 and early 1920. They gave an especially strong stimulus to exports, which is normal.<sup>279</sup> Also, the low real interest rates stimulated domestic demand. So, the German economy picked up, and the number of unemployed fell rapidly. Because of the mark's decline, the divergence between German prices and world prices was large and German wages remained low. This caused German businesses to do well, so confidence in the stock market improved and prices rose. Because of the very rapid currency depreciation and price declines of Government securities, mortgages, and debentures—in fact, all securities with a fixed yield—declined in value.

<sup>279</sup> Bresciani-Turroni p. 256-7

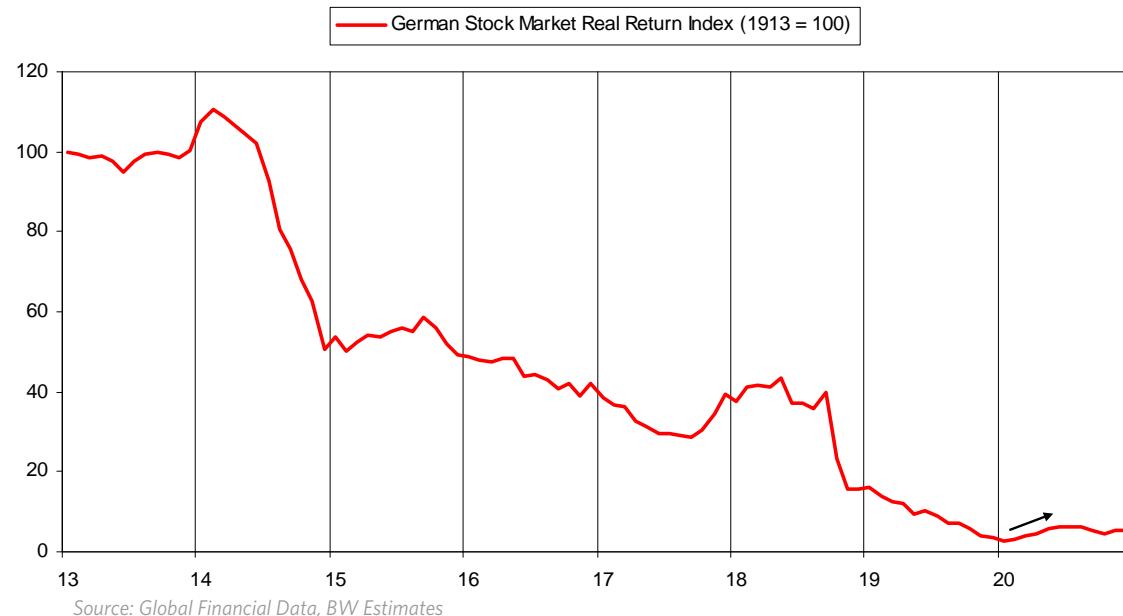
So, in 1919, this decline in the value of debt instruments also drove investors to buy shares and other assets like gold for their "intrinsic" value. The public now saw that the paper mark and debt could no longer fulfill the function of the "store of value."<sup>280</sup>

The period between the start of 1919 and spring 1920 was one when stock prices rose continuously (nearly doubling) because of buying for their intrinsic value, unemployment fell, and the currency entered a period of "relative stabilization." The chart below shows stock prices during this period.



Source: Global Financial Data, BW Estimates

The next chart shows stock prices expressed in US dollars for the same period.



Source: Global Financial Data, BW Estimates

<sup>280</sup> Bresciani-Turroni p. 256-7

## 1921

As noted earlier, central banks in other countries pursued tight money policies in 1920. These tight money conditions in other countries in 1920 led to a bad world contraction in 1921. Though this was called a deleveraging, which was then the name for all economic contractions, it was primarily driven by monetary policies, so this contraction had some of the markings of what we refer to as a recession, though certainly it was a very bad recession. Between 1920 and 1921, industrial production fell by 20% in the US, by 18.6% in the UK, and by 11% in France, largely as a result of this monetary tightening. In the US, unemployment reached 12%. At the bottom of the contraction, which occurred around mid-1921, 22% of the total population was out of work.<sup>281</sup> So it was certainly a very severe global contraction.

However, economic conditions in Germany in 1920 and 1921 continued to be very different from those in the other leading industrial countries—most importantly, Germany did not suffer a severe contraction because of its reflationalary policies—mostly because German monetary policies were easy (largely because of its easy money policies and the absence of a tie with gold), while those in other countries were tight.<sup>282</sup>

As a result of these relative economic conditions and the differences in monetary policy that accompanied them, the German exchange rate became more stable between April 1920 and May 1921. That was because conditions in other countries were so bad that they drove investors to Germany. However this currency stability and weakness in other economies naturally created difficulties for German export-dependent industries. But domestic demand remained strong. As a result, German industrial production increased by 20.4% between 1920 and 1921, on the heels of the 46% increase that occurred between 1919 and 1920. So 1919–1921 was a period of strong growth for Germany. Average unemployment during 1921 declined to only 2.8% of trade union members, which was below the 1920 average of 3.8%.<sup>283</sup> Still in 1921–22, German industrial production remained much lower than in 1913, so this period of growth was within the period of greater economic contraction for Germany.

In that year, the money supply remained almost stable—e.g., the gold mark was worth 14.2 paper marks in April 1920 and 14.9 in March 1921, as the world's deflationary contraction and Germany's favorable relative growth supported the mark. In spite of that, the budget deficit was huge—roughly 15% of GDP—which equated to 60% of the total expenses (in the financial year of 1920–21) and that large deficit was financed by the issue of Treasury bills. So, in the period from February 1920 to May 1921, the supply of floating debt was increased a lot; however, the inflationary effects were mitigated by the global deflationary period.<sup>284</sup>

In 2Q1920 the German economy began to weaken along with the global economy. The German currency had been stable until May 1921, but then it began to soften. Then, along with the economy weakening, the Allies restructured Germany's external debt via the "London Ultimatum". The "agreement" was called the "ultimatum" because the allies threatened to occupy the Ruhr Basin within six days if Germany didn't agree to the plan. It specified the final payments plan which set war reparations at 132 billion gold marks, with 50 billion in gold marks bonds up front and 2 billion gold marks in the first year, plus 1 billion gold marks over the next few months, and some other taxes.<sup>285</sup> In other words, it solidified a huge debt burden for Germany. Naturally that implied that domestic debts and the currency would have to be depreciated because the government faced the choice of either (a) printing and taxing, or (b) having money and credit tighten and the weak economy contract, and it was obvious which they would choose.

While the German government was being pressured by these circumstances to print more money, Allied governments wanted German currency stabilization because mark weakness made Germany more competitive.

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<sup>281</sup> Holtfrerich p. 209

<sup>282</sup> Holtfrerich p. 211

<sup>283</sup> Holtfrerich p. 211

<sup>284</sup> Bresciani-Turroni p. 56

<sup>285</sup> Holtfrerich p. 301

British industry wanted “the competitive advantage on world markets which the fall in the mark was giving to German industry to be curtailed” by a currency stabilization. At the time, unemployment in Britain reached 23.4%. But, as always, fundamentals won out over the Allies’ wishes, and German “currency dumping” began in May 1921.

The new tax sources, made available to the Reich between 1919 and 1921 under the “Erzberger Reforms”, had increased the revenues of the Reich during fiscal year 1921. There were enough tax revenues to cover ordinary expenditures but not reparations. By the beginning of 1922, tax revenues had increased not only in nominal terms, but even in gold mark values, while expenditures were strictly controlled. In the first quarter of the new fiscal year (April-June 1922), Germany was able to finance not only its entire ordinary and extraordinary expenditure out of taxation, but even to apply a considerable sum from the same source to meeting reparations charges.

So let’s review. Economic weakness and the Ultimatum of London of May 1921 provoked the collapse of the mark.<sup>286</sup> It was originally proposed that reparations would equal an annuity of eight billion gold marks which would have taken 23.2% of German national income in 1919, 21.3% in 1920, 19.8% in 1921 and 19.0% in 1922. But these burdens were reduced to three billion gold marks by the London Ultimatum due to a more realistic assessment of Germany’s capacity to pay. Still, three billion gold marks represented an enormous burden of 7.4% of German national income in 1921, 7.1% in 1922 and 8.0% in 1923, especially on top of German’s other debts.<sup>287</sup>

Between 1919 and 1922 Germany paid at least the eight billion, which is the amount credited to Germany by the Reparations Commission, though it is widely estimated that the payments were considerably more. The independent and unconnected estimates by Keynes and by Moulton and McGuire—twenty-six billion—are probably nearer the truth. In current gold marks aggregate German national income in the four years 1919–22 was 287.7 billion. Actual payments then ranged between 3.1% and 21.8% of this but were most likely (following the Keynes or Moulton/McGuire estimates) about 10%.<sup>288</sup> A historian recently calculated that a level of taxation equal to thirty-five percent of national income would have been required to defray postwar expenditures on reparations, social welfare, and the general running costs of the government.<sup>289</sup> The estimate of the gold mark value of the Reich’s current payments on reparations account was 4.9 billions in 1919, falling to 2.1 billions in 1920. But with the London Ultimatum of May 1921, the gold mark value of payments began to rise again: 2.8 billions in that year and 3.4 billions in 1922.<sup>290</sup> In other words, it was too much.

We can get a sense of the magnitude of the government’s funding needs by looking at the next table. Reparations are included in the budget deficit numbers. As shown, it was huge. To fund this gap, the Reichsbank had to print the money to make purchases of this debt.

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<sup>286</sup> Bresciani-Turroni p. 96

<sup>287</sup> Holtfrerich p. 149

<sup>288</sup> Holtfrerich p. 149

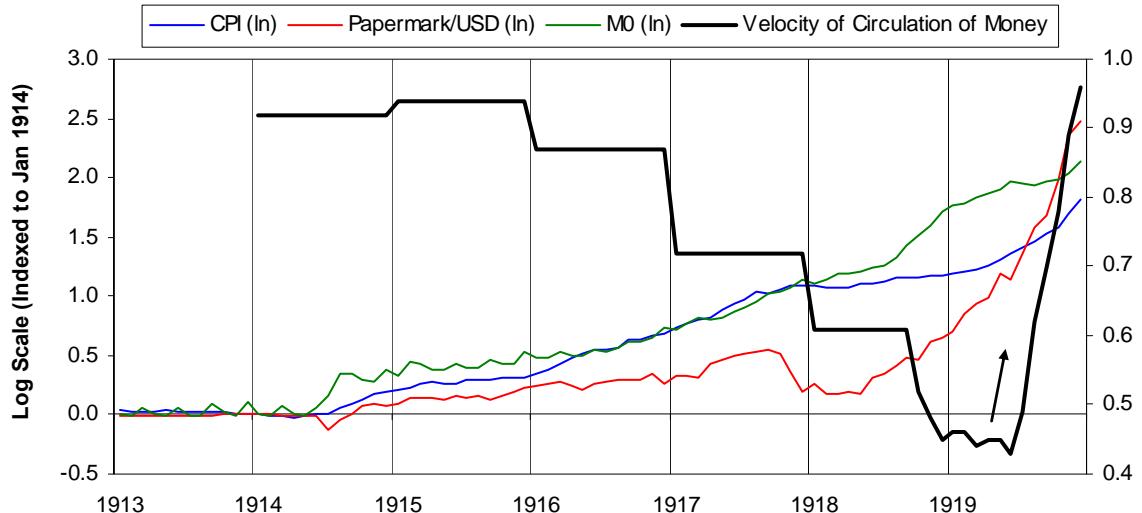
<sup>289</sup> Holtfrerich p. 137

<sup>290</sup> Holtfrerich p. 150

#### German Reich Income and Expenditure

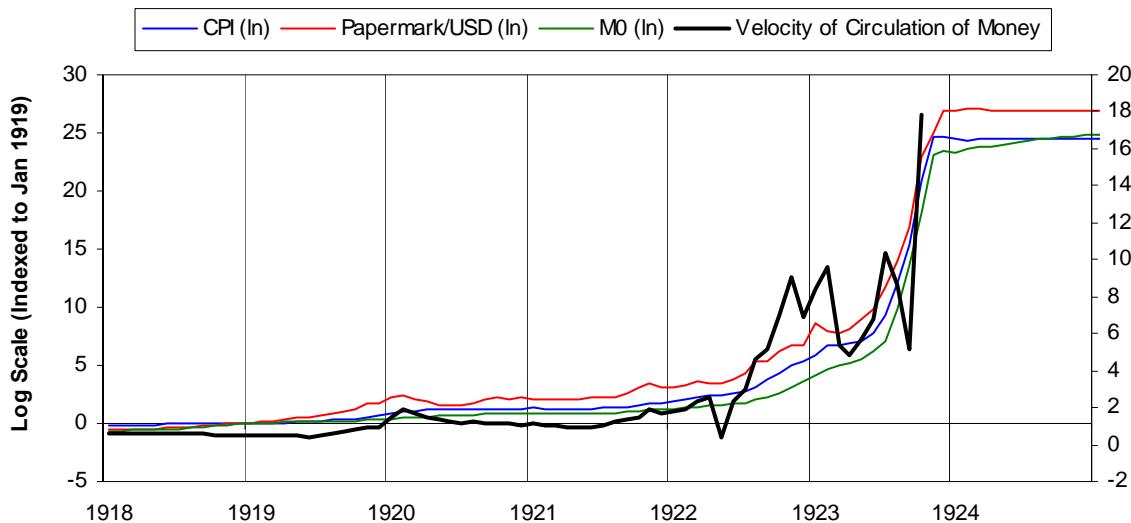
|      | Millions of Gold Marks |             |             |                |               | % of Net National Product |             |             |                |               |
|------|------------------------|-------------|-------------|----------------|---------------|---------------------------|-------------|-------------|----------------|---------------|
|      | Revenue                | Expenditure | Reparations | Budget Deficit | Trade Balance | Revenue                   | Expenditure | Reparations | Budget Deficit | Trade Balance |
| 1919 | 2,496                  | 8,643       | -           | -6,054         | -4,131        | 7.3%                      | 25.3%       | -           | -17.7%         | -12.1%        |
| 1920 | 3,171                  | 7,098       | 1,236       | -6,092         | 3             | 8.4%                      | 18.8%       | 3.3%        | -16.2%         | 0.0%          |
| 1921 | 6,237                  | 10,395      | 3,369       | -4,939         | -693          | 15.4%                     | 25.7%       | 8.3%        | -12.2%         | -1.7%         |
| 1922 | 4,032                  | 6,240       | 2,226       | -3,953         | -2,230        | 9.6%                      | 14.8%       | 5.3%        | -9.4%          | -5.3%         |
| 1923 | 1,785                  | 6,543       | 801         | -8,431         | -5            | 4.7%                      | 17.3%       | 2.1%        | -22.2%         | 0.0%          |
| 1924 | 4,869                  | 4,894       | 281         | -25            | -2,444        | 10.9%                     | 11.0%       | 0.6%        | -0.1%          | -5.5%         |
| 1925 | 4,958                  | 5,321       | 1,080       | -363           | 793           | 7.4%                      | 7.9%        | 1.6%        | -0.5%          | 1.2%          |
| 1926 | 5,633                  | 6,561       | 1,310       | -928           | -2,960        | 8.6%                      | 10.0%       | 2.0%        | -1.4%          | -4.5%         |
| 1927 | 6,697                  | 7,154       | 1,779       | -427           | -1,311        | 8.3%                      | 8.9%        | 2.2%        | -0.5%          | -1.6%         |
| 1928 | 6,992                  | 8,375       | 2,178       | -1,383         | -44           | 8.3%                      | 10.0%       | 2.6%        | -1.6%          | -0.1%         |
| 1929 | 7,215                  | 8,042       | 1,965       | -827           | 1,558         | 9.1%                      | 10.1%       | 2.5%        | -1.0%          | 2.0%          |
| 1930 | 7,098                  | 8,163       | 1,879       | -1,065         | 2,778         | 9.9%                      | 11.4%       | 2.6%        | -1.5%          | 3.9%          |
| 1931 | 6,059                  | 6,548       | 651         | -489           | 1,052         | 10.5%                     | 11.4%       | 1.1%        | -0.9%          | 1.8%          |
| 1932 | 5,448                  | 5,819       | 183         | -371           | -2,394        | 10.7%                     | 11.5%       | 0.4%        | -0.7%          | -4.7%         |

The next chart shows the exchange rate, M0, the CPI, and the velocity of money during the 1920-24 period. Notice that the decline in the currency value and the increase in the velocity of money led the increase in inflation, which led M0 growth as the central bank chose to accommodate these demands. This is typical in all monetary inflations, so you will also observe them to be true in the Brazilian, Argentine, Russian, and Thai cases. In other words, money supply growth did not cause these other things to happen; rather investors' movements of capital out of debt and out of currency caused these changes, which the Reichsbank accommodated by printing money (i.e., M0). The sudden rise in the velocity of money after July 1921 was due to the outbreak of a new crisis of doubt in the value of holding cash.<sup>291</sup>



Source: Global Financial Data, BW Estimates

<sup>291</sup> Bresciani-Turroni p. 172



Source: Global Financial Data, BW Estimates

In August 1921 it was clear that getting adequate income and wealth taxes from the rich was difficult (largely because incomes were down and wealth was illiquid), and those who opposed the “taxation of material wealth” in the Reichstag were strong enough to be able to block many of the wealth tax attempts. The government then abandoned the idea of a mortgage tax in favor of heavy taxes on consumption goods because they were more effective. It is important to realize that wealth taxes are usually ineffective because much wealth is illiquid, and because collections on the “mortgage” don’t generate much cash.

After the autumn of 1921, the depreciation of the German mark became even more rapid and economic activity strengthened further. It was clear that a falling mark and rising inflation produced prosperity. According to the official statistics, the number of unemployed, which was high at the beginning of 1919, fell continually until the summer of 1922, when unemployment practically disappeared. However, any time there was an improvement of the mark there then was an increase of unemployment (see March-July 1920; November 1920-February 1921; December 1921-January 1922), and every depreciation of the mark was followed by an improvement in conditions of the labor market (January-February 1920; July-November 1920; April-November 1921; and then during the first half of 1922.) So it was clear that monetary stimulation and the weak exchange rate stimulated the economy. When the mark depreciated, foreign and domestic demands for goods increased. Foreign purchasers wanted to profit by the greater purchasing power of their own money in the Germany market, and the prospect of continuous increases in prices stimulated the demand to buy goods as a means of getting out of a depreciating currency. When the mark improved, foreign demand declined and in Germany there occurred what in the summer of 1920 was called “the buyers’ strike.”

The German press called the industrial and commercial situation between October 1921 and the summer of 1922 one of “general liquidation” because the shops were empty due to foreigners buying a lot because the mark was cheap, and Germans buying a lot because they worried about inflation. At the beginning of November 1921, the flight from the mark became a panic which rapidly spread through all classes of society.

In November, the depreciation of the mark provoked a big increase in orders, especially for inflation hedge and export items. The metallurgical industries were working at full capacity, so that they had to introduce overtime, and they refused to accept new orders. As cars are long-lived, the automobile industry had a period of peak prosperity. The textile trade had bookings for several months ahead, and the cotton firms refused to take new orders. It was clear that accelerating inflation and rising trade competitiveness from the depreciating value of the mark, rather than more sustainable drivers of growth, provided this demand.<sup>292</sup>

<sup>292</sup> Bresciani-Turroni p. 188-197

Then, from November 26 to December 1, 1921, the mark strengthened by about a third—i.e., the dollar rate fell sharply from 293 to 190 paper marks.<sup>293</sup> This big whipsaw appears to have been due to a short squeeze as the speculation against the mark in many ways (typically from borrowing it and Germans keeping money outside the country) became overdone. As always, the mark's strength hurt the economy. In fact, press reports from that time declared that the improvement of the mark had been a catastrophe for German industry.<sup>294</sup> Trade orders rapidly diminished. Eventually, the shorts were squeezed and the impacts on trade and capital flows began to work against the mark.

So in February 1922 the mark began to fall, and on March 7 it was all the way back to 262 paper marks to the dollar. And the economy picked up again. A new wave of commercial and industrial activity followed in the form of panic buying. “It is no longer simply a zeal for acquiring, or even a rage: it is a madness,” according to one observer of the time. Merchants bought for fear that if they waited the stocks would be exhausted. As a result, 1922 was a boom year, though in 1922 (which was the year of greatest economic expansion after the war) the level of economic activity still was no more than 70–80% of production in 1913, so despite this strength, the economy was still in the contraction that began in 1918.<sup>295</sup>

While one might think that the boom of 1922 was good for workers, it wasn't. That is because there was a big contrast between the continual increase of German production and wages, which did not keep up with inflation. Also, there was a deficiency in agricultural production due to the lack of certain chemical fertilizers and a shortage of labor. At the time there was a widely reported “fall in the intensity of labor” in 1919–1923,<sup>296</sup> which hurt productivity. However, what was good for the average man was that during the inflation, rents fell on an inflation adjusted basis to almost zero. This was obviously bad for those who owned rental properties.

The inflation and negative real interest rates encouraged borrowing to invest as well as to spend. Real investment was at least as high as before the war.<sup>297</sup> The inflation stimulated a demand for “producers” goods because they were viewed as having relatively long income producing lives with these incomes tied to prices in the future (i.e., they were considered good inflation hedges). This market action is typical in high inflation environments. Similarly, it was widely recognized that short-term bank credits could be used to make long-term investments because, thanks to the increase of prices, the debtor could repay with depreciated money. It was thought that even if for the time being the new equipment was not utilized, it had an “intrinsic value”. Similarly, at that time, the savings of entrepreneurs who readily adapted their behavior to make money went into tangible assets such as iron and stones. Also, to avoid the effects of the monetary depreciation, those in German agriculture continued to buy machines. The “flight from the mark to the machine”, as it was called at the time, was one of the most convenient means of defense against the depreciation of the currency. Of course, those forms of investment were excessive and eventually did badly. For example, towards the end of the inflation, farmers realized that a great part of their capital was sunk in machines that were far more numerous than they needed.<sup>298</sup>

Those whose wealth was in fixed value monetary assets (e.g., bonds) and who did not learn to protect it by shifting into real assets or by contracting equivalent debts suffered devastating losses.

During the inflation, all companies, with rare exceptions, continually increased their capital<sup>299</sup> by borrowing because one of the rules of good management during these inflationary times was to take on as much debt as possible because debts could be repaid with depreciated currency. At that time, smart investors were buyers of shares, firms, securities, and merchandise—i.e., they were buyers of tangible rather than financial wealth.<sup>300</sup> So,

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<sup>293</sup> Bresciani-Turroni p. 188-197

<sup>294</sup> Bresciani-Turroni p. 188-197

<sup>295</sup> Bresciani-Turroni p. 188-197

<sup>296</sup> Bresciani-Turroni p. 188-197

<sup>297</sup> Holtfrerich p. 205

<sup>298</sup> Bresciani-Turroni p. 188-197

<sup>299</sup> Bresciani-Turroni p. 255

<sup>300</sup> Bresciani-Turroni p. 294

there was a big shift by capitalists toward producing "goods for production" rather than "goods for consumption", and toward getting "short money" via borrowing. Of course, those who provided these goods demanded very high prices for them, so there was a more rapid increase in prices of producers' good than in those of consumers' goods.

Another reason for the high investment rates was to minimize taxes. By investing profits back in capital goods businesses could create expenses to lower their reported profits to escape onerous taxes.

At times of rapid depreciation of the mark, such as in the autumn of 1921, the stock market rose sharply.<sup>301</sup> Speculation in stocks was popular as a currency/inflation hedge, and became rampant at the time. A newspaper at the time wrote, "Today there is no one—from lift-boy, typist, and small landlord to the wealth lady in high society—who does not speculate in industrial securities and who does not study the list of official quotations as if it were a most precious letter."<sup>302</sup>

Because stocks were driven by the value of money/currency at the time (in 1920–1921), prices of industrial shares stopped being a good barometer of economic activity. In fact, the opposite was true—events which were unfavorable to Germany caused a fresh depreciation of the mark which caused a rise in the prices of industrial securities.<sup>303</sup>

From mid-1920 through the end of 1921 share prices responded to the fluctuations in the value of the currency<sup>304</sup> and nearly tripled in inflation adjusted terms. In the autumn of 1921, the mark collapsed and a fresh spurt in exports occurred.<sup>305</sup>

Then, in the first months of 1922, there was a relative stabilization of the mark. At the time, German exports were less than German imports. That is because exports consisted mainly of primary products, so when the exchange rate fell, the beneficial effects of increased exports were offset by the negative effects of rising import prices. So mark weakness hurt sectors such as food, drink and tobacco whose outputs were sold at home but whose raw material inputs were purchased abroad. Many people at the time believed that the real stimulus that arose from the mark's decline was from the inflation that came substantially as a result of the fall in real interest rates<sup>306</sup> that led to inflation hedge buying.

Germany ran a large trade deficit between 1919 and 1922, though quantifying it is not possible for that period because of the difficulty of ascertaining correct gold-mark valuations of the trade flows. Still, we know that the deficit was big. Estimates vary from 4.5 to 11 billion gold marks which equaled 12% to 28% of GDP. On top of that deficit Germany had to come up with 2.6 billion gold marks worth of cash reparations payments, which equaled 6.7% of GDP. While a small surplus might have been earned on invisible account during those years (chiefly from tourism) it was very small, so the sum of the trade deficit plus reparations represents the order of magnitude of the current account deficit which appears to be somewhere between 11% and 17% of GDP!<sup>307</sup> Though we don't know what it was exactly, we know that it was huge.

How did this get funded? It was funded by foreign countries, mostly via individual investors who were lured by higher German interest rates. They accumulated substantial paper-mark claims on Germany throughout the 1914–1922 period. So Germany became a debtor to other countries' investors with the debt largely denominated in its own currency. The table below shows estimated Weimar Germany balance of payments numbers.

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<sup>301</sup> Bresciani-Turroni p. 256-7

<sup>302</sup> Bresciani-Turroni p. 260

<sup>303</sup> Bresciani-Turroni p. 260

<sup>304</sup> Bresciani-Turroni p. 260

<sup>305</sup> Bresciani-Turroni p. 229

<sup>306</sup> Holtfrerich p. 203

<sup>307</sup> Holtfrerich p. 283

**Weimar Germany Balance of Payments**

|                  | Millions of Gold Marks |                |                  |                 |                      | % of Net National Product |              |                  |                 |                      |
|------------------|------------------------|----------------|------------------|-----------------|----------------------|---------------------------|--------------|------------------|-----------------|----------------------|
|                  | Trade Balance          | Reparations    | Net Gold Balance | Service Balance | Net Capital Movement | Trade Balance             | Reparations  | Net Gold Balance | Service Balance | Net Capital Movement |
| <b>1919</b>      | -4,131                 | -435           | 300              | 160             | 4,106                | -12.1%                    | -1.3%        | 0.9%             | 0.5%            | 12.0%                |
| <b>1920</b>      | 3                      | -1,236         | 300              | 160             | 773                  | 0.0%                      | -3.3%        | 0.8%             | 0.4%            | 2.1%                 |
| <b>1921</b>      | -693                   | -3,369         | 300              | 160             | 3,601                | -1.7%                     | -8.3%        | 0.7%             | 0.4%            | 8.9%                 |
| <b>1922</b>      | -2,230                 | -2,226         | 300              | 160             | 3,996                | -5.3%                     | -5.3%        | 0.7%             | 0.4%            | 9.5%                 |
| <b>1923</b>      | -5                     | -801           | 300              | 160             | 346                  | 0.0%                      | -2.1%        | 0.8%             | 0.4%            | 0.9%                 |
| <b>1919-1923</b> | <b>-7,056</b>          | <b>-8,067</b>  | <b>1,500</b>     | <b>800</b>      | <b>12,822</b>        | <b>-3.7%</b>              | <b>-4.2%</b> | <b>0.8%</b>      | <b>0.4%</b>     | <b>6.7%</b>          |
| <b>1924</b>      | -2,444                 | -281           | -1,255           | 274             | 2,919                | -5.5%                     | -0.6%        | -2.8%            | 0.6%            | 6.6%                 |
| <b>1925</b>      | 793                    | -1,057         | -90              | 462             | 3,135                | 1.2%                      | -1.6%        | -0.1%            | 0.7%            | 4.7%                 |
| <b>1926</b>      | -2,960                 | -1,191         | -568             | 532             | 607                  | -4.5%                     | -1.8%        | -0.9%            | 0.8%            | 0.9%                 |
| <b>1927</b>      | -1,311                 | -1,584         | 452              | 645             | 3,792                | -1.6%                     | -2.0%        | 0.6%             | 0.8%            | 4.7%                 |
| <b>1928</b>      | -44                    | -1,990         | -931             | 672             | 4,123                | -0.1%                     | -2.4%        | -1.1%            | 0.8%            | 4.9%                 |
| <b>1929</b>      | 1,558                  | -2,337         | 165              | 712             | 2,304                | 2.0%                      | -2.9%        | 0.2%             | 0.9%            | 2.9%                 |
| <b>1930</b>      | 2,778                  | -1,706         | 120              | 538             | 490                  | 3.9%                      | -2.4%        | 0.2%             | 0.7%            | 0.7%                 |
| <b>1931</b>      | 1,052                  | -988           | 1,653            | 450             | -2,693               | 1.8%                      | -1.7%        | 2.9%             | 0.8%            | -4.7%                |
| <b>1932</b>      | -2,394                 | -160           | 256              | 265             | -513                 | -4.7%                     | -0.3%        | 0.5%             | 0.5%            | -1.0%                |
| <b>1924-1932</b> | <b>-2,972</b>          | <b>-11,294</b> | <b>-198</b>      | <b>4,550</b>    | <b>14,164</b>        | <b>-0.5%</b>              | <b>-1.9%</b> | <b>0.0%</b>      | <b>0.8%</b>     | <b>2.4%</b>          |

It's estimated that foreigners transferred capital to Germany to the amount of 15.7 billion gold marks over the period 1914–22 as a whole. J.M. Keynes and K. Singer estimated the unrequited resource transfer into Germany between 1919 and 1922 at between eight and ten billion gold marks. So Germany essentially borrowed money from private foreigners and in turn used the money it borrowed to pay foreign government reparations—so it was essentially a Ponzi scheme.<sup>308</sup> While it looked like Germany was both making its reparation payments and providing investors with high returns, these payments came from borrowing money from foreigners. This is very much like the carry trade dynamic that was very popular in 2004–2007.

Foreigners also bought industrial or bank shares, houses, and, and in a lesser degree, land because prices were so low<sup>309</sup> and the economy gave the appearance of being prosperous because it was relatively strong due to its large borrowings. So these capital flows helped to fill the gap.

As long as foreigners were willing to invest funds in marks, they also helped to keep the German currency from being weaker than it would have otherwise been. This was the case from February 1920 to May 1921, the period when the mark was fairly stable on the foreign exchanges despite a nearly fifty percent growth of the high-powered money stock. Between 1919 and 1923 Germany transferred 2.6 billion gold marks in cash to the Allies.

However, this ended up being only one third of what foreigners lost through the depreciation of their German bank balances.<sup>310</sup> Foreign investors in Germany, especially in German debt, ended up losing huge amounts of money. For example, foreign (non-German) losses on debt due to depreciation were estimated at between seven and eight billion gold marks.<sup>311</sup>

In 1921 the average inflation rate was 140%, the real growth rate was 8.6%, M0 growth was 51% the mark fell by 163% and the real stock market rose by approximately 13% in US dollar terms and 75% relative to domestic prices.

<sup>308</sup> Holtfrerich p. 285

<sup>309</sup> Bresciani-Turroni p. 240

<sup>310</sup> Holtfrerich p. 295–6

<sup>311</sup> Holtfrerich p. 286

# Hyperinflation

January 1922- November 1923

## First Half of 1922: The Transition to Hyperinflation

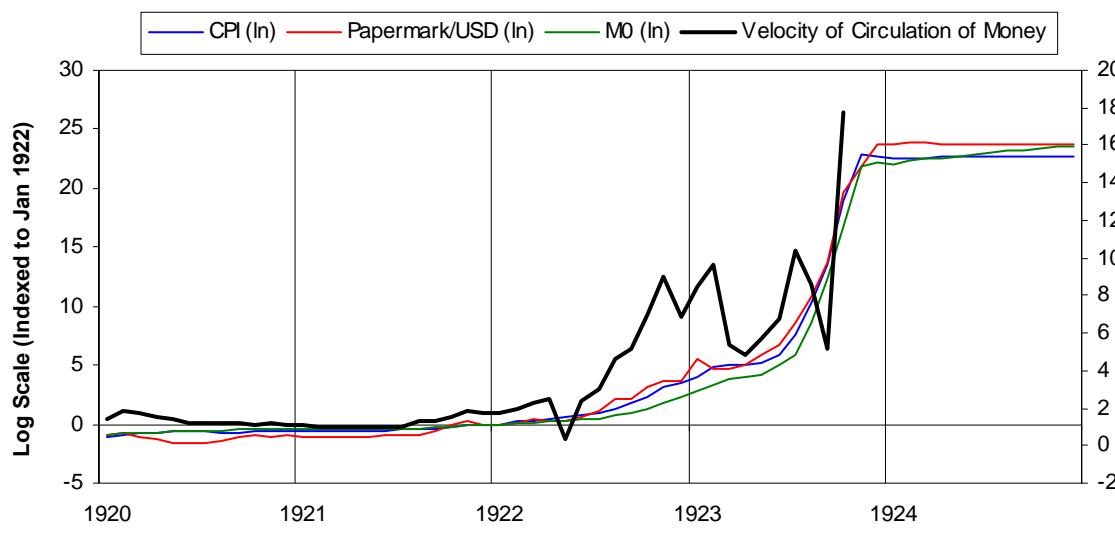
*The stock market crashes; foreigners pull out of investments; mark depreciation accelerates; liquidity crisis; Reichsbank prints money and makes loans directly to the private sector...*

In 1922, as the rate of price increases accelerated towards hyperinflation, there was a labor scarcity that drove the unemployment rate below one percent.

As inflation became hyperinflation, the currency weakness started to hurt the economy rather than to help it and stocks no longer seemed like a viable hedge against inflation. Also, in January the allies imposed fiscal restraints on Germany. Instead of there being a high correlation between the exchange rate of the dollar and the price of shares, there was an increasing divergence between share prices and the exchange rate.

Foreigners pulled out in 1922, which caused a liquidity crisis, which led to the central bank to print the money to ease the crisis, which led to an increase in inflation. This is a classic dynamic of debtor countries when they experience foreign capital withdrawals and economic weakness at the same time. In other words, when money leaves a country, (typically when foreign and domestic investors fear that they will lose money in debt instruments due to a credit crisis being accommodated by the central bank aggressively providing liquidity typically to fund growing budget deficits), the central bank is forced to choose between tighter money and printing money. As the economy is weak and credit is already tight, there really is no choice.<sup>312</sup>

As shown in the chart that follows, late in 1H22, the velocity of money accelerated, the mark depreciated, inflation rose and M0 growth increased to accommodate this increased demand for cash.



Source: Global Financial Data, BW Estimates

In the spring of 1922, when foreigners' willingness to hold mark bank balances declined, this caused an acute liquidity crisis. Because such crises generally lead to bank and business collapses, in July 1922, the Reichsbank began to increase the supply of central bank money by stepping up its discounting of private bills. So the shift from inflation into hyper-inflation during 1922 was due to the decreased willingness of foreign and domestic investors to lend in marks, and the response of the central bank to replace this lost capital with printed currency

<sup>312</sup> Holtfrerich p. 289

At this point German investors were subjected to foreign exchange controls and legislation against capital flight.<sup>313</sup>

In January 1922, a deal was cut in which the Allies granted a reparations moratorium in exchange for a halt to Germany's printing of money and stabilizing its exchange rate. Consistent with this deal, increasing taxes and cutting expenditures were demanded as the means of balancing the Reich's budget. Also, the allies required that the Reichsbank be made autonomous, in the hope of stiffening its resistance to the Reich's demands for credit. The German side accepted these conditions.

After the ominous "Black Thursday" (December 1, 1921), shell shocked investors realized that not even the purchase of shares was a safe means of investing their savings, so stocks fell. By October 1922, the stock market index was at its lowest level since 1914.

The enormous drop in share prices that started in December 1921 caused stocks to become extremely cheap by late 1922. One example that is given is that all the share capital of Daimler was worth a value of 327 cars though it had "considerable plant and equipment, an extensive area of land, its reserves and its liquid capital, and its commercial organization developed in Germany and abroad."

In this 1921/1922 bear market, shareholders lost 75% on their investments. The table below shows equity shares against goods prices, conveying shareholders' real losses, even though nominal prices rose. As shown, the currency (i.e., mark) declined and wholesale prices increased by similar amounts, the total cost of living index rose by a bit less, shares rose by considerably less and M0 rose by even less. This reflects the fact that the increase in M0 was not the cause of the inflation and the currency depreciation, but rather was due to money supply being increased to accommodate the higher inflation and currency depreciation. In other words, a self-reinforcing inflationary cycle developed in which the increased needs for money were accommodated by the central bank printing more, which led to currency weakness, higher inflation and less capital going into credit, which created more demand for money, which the central bank accommodated.

|        | 1922                        |                  |                  |                |       |
|--------|-----------------------------|------------------|------------------|----------------|-------|
|        | Exchange Rate of the Dollar | Prices of Shares | Wholesale Prices | Cost of Living | M0    |
| Jan-22 | 100                         | 100              | 100              | 100            | 100   |
| Feb-22 | 108                         | 113              | 112              | 120            | 104   |
| Mar-22 | 148                         | 133              | 148              | 142            | 108   |
| Apr-22 | 152                         | 138              | 173              | 168            | 121   |
| May-22 | 129                         | 117              | 176              | 186            | 131   |
| Jun-22 | 165                         | 111              | 192              | 203            | 145   |
| Jul-22 | 257                         | 121              | 274              | 264            | 163   |
| Aug-22 | 591                         | 156              | 524              | 380            | 203   |
| Sep-22 | 764                         | 170              | 783              | 652            | 268   |
| Oct-22 | 1658                        | 277              | 1544             | 1081           | 389   |
| Nov-22 | 3744                        | 548              | 3140             | 2185           | 619   |
| Dec-22 | 3956                        | 1209             | 4024             | 3360           | 1,040 |

In the period of relative stabilization of the exchange, which occurred in the first months of 1922, the recovery of the national finances made some progress as the German Government adopted some financial measures to reduce expenditures. But confidence in the mark, which the event of September 1921 had profoundly shaken, could not be re-established.

After June 1922, a new wave of pessimism swept over Germany. German speculation renewed its attacks against the mark, which once again suffered a sharp fall. The number of people who positioned themselves to

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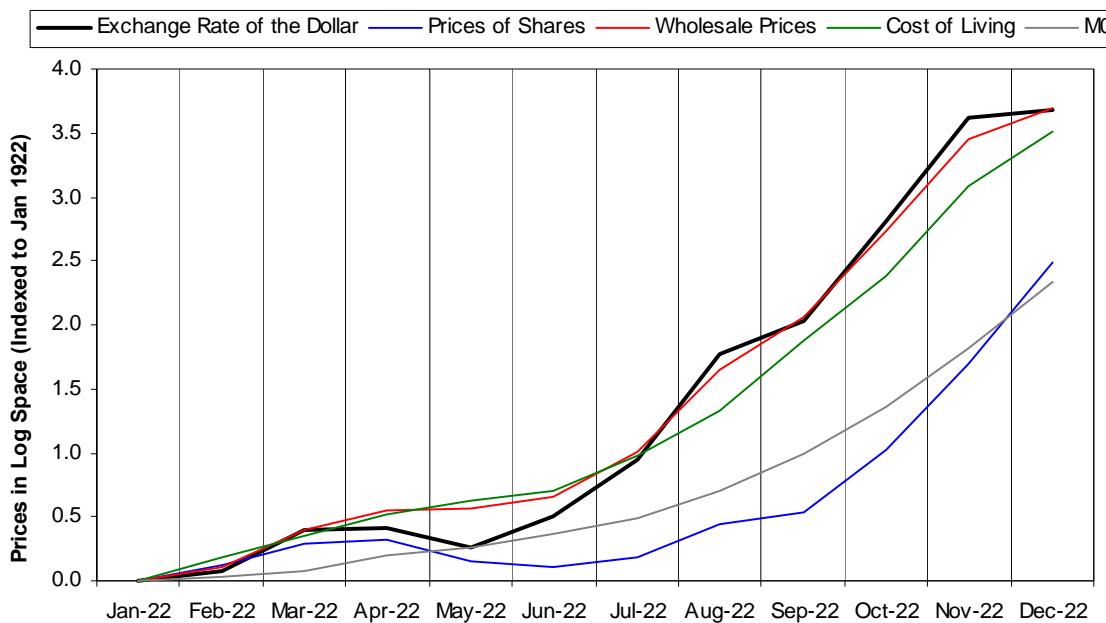
<sup>313</sup> Holtfrerich p. 289

benefit from a continuous depreciation of the mark increased continually in Germany. Not only the great industries and the large merchant firms, but also numerous classes of investors, hoarded foreign bills or currency, which they bought with borrowed marks. Investors also wanted to escape the mark and the government's confiscatory taxes so anyone who had wealth invested it in foreign currencies, bills, securities, etc., which were easily concealed. The "flight of capital," which in Germany became a "mass phenomenon" that restrictions did not succeed in stopping, continually removed a huge amount of taxable wealth from Germany. Producers protected themselves by forcing their customers to pay in foreign money, or to pay amounts in paper marks which were computed at the rate of the day on which the producer could convert them into foreign money. The retail trader at that time tried to protect himself by fixing a basic price in gold marks or dollars which he converted into paper marks at the daily rate.

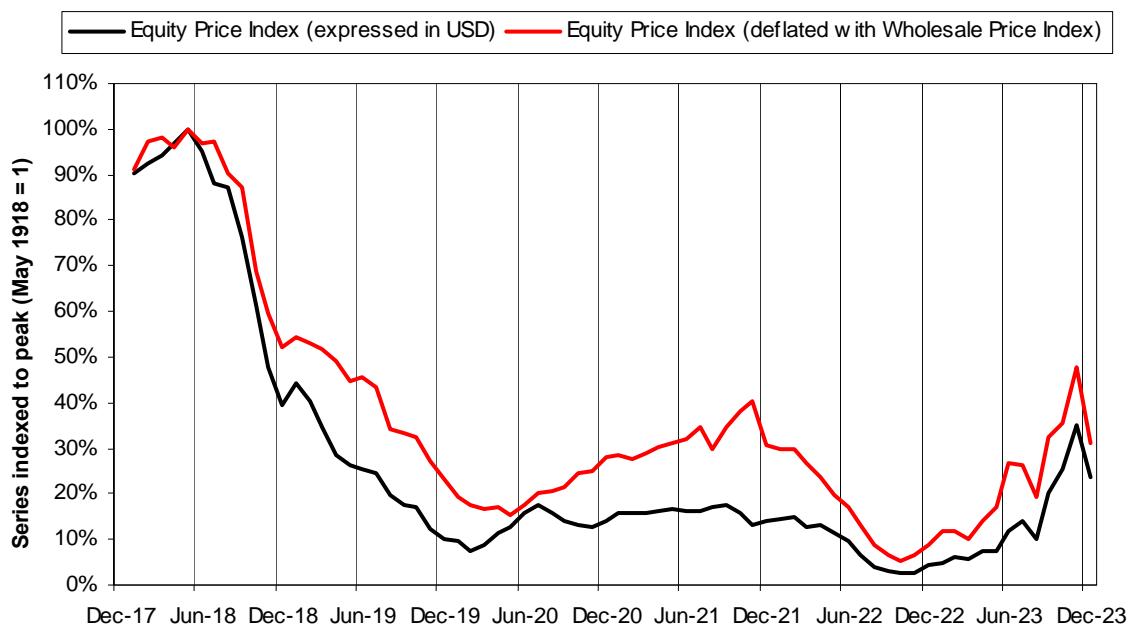
The disequilibrium between the demand and supply of foreign bills was the result of the following factors:

- (a) Having little faith in the political and economic future of Germany and desiring to avoid taxes, German industrialists left abroad a part of the profits from exports; that is, the difference between the cost of production and the price which they received by selling abroad.
- (b) A lot of the foreign money which was obtained by German sales to foreigners of securities, houses, land, etc., was either left abroad (the "flight of capital") or hoarded at home, so that it did not come on to the exchange market.
- (c) The numerous laws that prohibited the buying of foreign exchange helped to lessen the supply of it because the possessor of foreign exchange would not give it up at any price, fearing that he would be unable to repurchase it later when the need arose.
- (d) A brisk demand for foreign exchange on the part of the German possessors of paper marks. More and more, as the mark depreciated the phenomenon was understood by the public and the mark ceased to be wanted as a "store of value."
- (e) As depreciation progressed, the mark became unfit as a medium of exchange. For example, the practice of calculating prices in foreign money became widespread in the second half of 1922 because it was more practical.

The chart below shows how the exchange rate's depreciation outpaced wholesale price increases, which outpaced the cost of living increases, which outpaced both M0 growth and stock price increases, from May 1922 through December 1922. As explained, that was because capital flows out of marks were accommodated by money growth in a self-reinforcing inflationary spiral—and not because money growth pushed prices higher.



The price movements of stocks are shown below. As shown by either measure, the real stock price fell by 80% to 90% from the end of the war in 1918 until mid-1920. Then inflation adjusted prices doubled to quadrupled (depending on which measure you use). Then inflation adjusted prices plunged to new lows in late 1922. Then in 1923, they rose by a factor of four or five. Imagine these whipsaws and what it must have been like to navigate through them.



It was clear that Germany's reparations debt needed to be restructured so a conference to explore how to do this occurred in Cannes in January 1922. The allies demanded that Germany stabilize its public finances by bringing its revenues and expenditures toward balance as the precondition for a reparations moratorium.<sup>314</sup> Finally on March 9, 1922, a compromise was concluded between the parties and authorization was given to the Government to impose a forced loan of a billion gold marks. This was executed in July 1922, when the wealthy classes were forced to make a "loan" to the government. However, they secured the right to make this loan payable in paper marks because there was no other viable means of making payment. This scared investors who were afraid of having their wealth confiscated, and because this fiscal tightening would certainly hurt economic growth. This development hurt the stock market and briefly stabilized the mark between March and May 1922.<sup>315</sup> For example, on the Berlin foreign exchange market the dollar exchange rate averaged 284.19 marks in March, 291.00 in April, 290.11 in May and, on June 9, 289.25. But it also caused businesses to suffer from illiquidity. The demands for bank credit increased as an attempt to raise liquidity by businesses. However, since at the same time the flow of funds to the banks fell, their own liquidity declined. At the same time the structure of their deposit liabilities shifted rapidly towards shorter term because depositors didn't want to grant longer term credit because they also were worried about their liquidity. So this increased bank liquidity risks. Banks in Germany were desperate for liquidity. In June, the Reparations Commission postponed consideration of loans to Germany until after a revision of reparations claims. That was the proverbial "straw that broke the camel's back"—i.e., it dashed hopes of an early stabilization of the mark which destroyed foreigners' willingness to accept payment in marks or to buy mark-denominated securities.<sup>316</sup>

Once foreigners were no longer prepared to buy German securities or real estate, and/or once the depreciation of the mark had so reduced the real value of these balances that they no longer mattered, this source of refinancing dried up. Then the choice was between extreme illiquidity and printing money at an accelerating rate, and the path was again obvious – i.e., to print. Then, since no one wanted to hold on to the currency in this rapidly depreciating inflationary environment, the velocity of money accelerated.<sup>317</sup> A rapidly accelerating velocity with rapid growth in the money supply is a classic sign of an inflationary deleveraging. This point was reached in spring 1922. At this point the mark and domestic prices entered the hyperinflationary phase.

<sup>314</sup> Holtfrerich p. 77-78

<sup>315</sup> Holtfrerich p. 77-78

<sup>316</sup> Holtfrerich p. 77-78

<sup>317</sup> Holtfrerich p. 77-78

The economy's demand for credit intensified as price and cost increases accelerated and the central bank satisfied them by printing money as credit growth collapsed. In June and July 1922, the supply of bank credit reached a standstill as saving through this medium dried up. In fact, savings banks actually experienced a decline in the nominal value of their savings deposits during July as investors did not see savings deposits as a viable option. The Reichsbank tried to encourage commercial bills as a way of supplying business with the liquidity which it did by discounting such bills and by a propaganda campaign in the press.

With credit from banks no longer available to businesses, the Reichsbank was faced with the classic choice all central banks in this situation face—to either allow illiquidity to cause businesses to collapse or to allow businesses to have direct access to the central bank's credit facilities. The latter alternative was not necessarily more inflationary than the former because the central bank giving money to businesses directly wasn't much different from the central bank giving it to the banks to give to the businesses. And, there was no doubt that the liquidity had to be provided. In fact, since evidence of illiquidity intensified the domestic and foreign flight from the currency as investors wanted to run from default risks, it was argued that providing the liquidity to businesses directly (because the banks were ill-equipped to provide it) would help to stabilize the situation. At the time, the higher inflation rate raised government expenditures faster than tax revenues. As long as the rising domestic price level kept raising the paper mark value of government domestic expenditures, and as long as the falling exchange rate kept raising the paper mark value of reparations obligations, and as long as the Reichsbank continued to finance the Reich budget deficit without restraint, there was no liquidity crisis to have a counterinflationary effect, so the spiral accelerated.<sup>318</sup>

There was some talk about the allies relieving Germany of some of the reparations burden. But on June 10, 1922 the mark rate broke when the Reparations Commission chaired by J.P. Morgan made public its refusal to recommend long-term foreign lending to Germany until her reparation liabilities had been adjusted to her capacity to pay.<sup>319</sup> Then depreciation turned into hyperinflation.

It was impossible to squeeze each year from the German people two billion gold marks, plus a sum equivalent to 26% of the value of exports,<sup>320</sup> so something had to be done. The British representative on the Reparations Commission proposed something similar to the Brady Restructuring of debt in 1991—i.e., that the German government should make its payment in the form of treasury certificates with a five year term and the Allied governments should place these on the market, adding their own guarantee to them. In this way Germany would defer its 1923 and 1924 reparation payments for five years.<sup>321</sup> In July 1922 reparation payments in foreign exchange were suspended. In spite of this, the depreciation of the German exchange continued.<sup>322</sup>

## Second Half of 1922

### *Liquidity crisis, Reichsbank policy, and monetary factors in the transition to hyperinflation...*

The spiral accelerated in 2H1922. The sudden rise in prices caused an intense demand for cash. At the same time the government's need of money increased rapidly. Private banks, faced with withdrawals, found it practically impossible to meet the demand for money, so it had to ration the cashing of checks presented to them. On some days, they had to suspend payments or open their offices for a few hours only. Naturally this caused panic, especially among the industrial and commercial classes who were no longer in a position to fulfill their contracts because of their cash shortages. Private checks were refused because it became known that the banks would be unable to cash them. Business stopped. The panic spread to the working classes when they learned that their employers did not have the cash with which to pay their wages.<sup>323</sup>

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<sup>318</sup> Holtfrerich p. 77-78

<sup>319</sup> Holtfrerich p. 304-6

<sup>320</sup> Bresciani-Turroni p. 80-82

<sup>321</sup> Holtfrerich p. 304-6

<sup>322</sup> Bresciani-Turroni p. 95-98

<sup>323</sup> Bresciani-Turroni p. 80-82

As credit was non-existent, money had to be produced to replace it and, as rapid money growth caused inflation, people didn't want to hold on to cash, so the velocity accelerated as cash was exchanged like a hot potato. As one economist on the time described it, "It was clear then that to stop the printing press would mean that in a very short time the entire public, and above all the Reich, could no longer pay merchants, employees, or workers. In a few weeks, besides the printing of notes, factories, mines, railways and post office, national and local government, in short, all national and economic life would be stopped."<sup>324</sup>

The government increased salaries in proportion to the depreciation of the mark, and employers in turn granted continual increases in wages, to avoid disputes, on the condition that they could raise the prices of their products. As is normal in such cases of prices and wage indexing, a vicious circle was established: the exchange depreciated; internal prices rose; note-issues were increased; the increase of the quantity of paper money lowered once more the value of the mark in terms of gold; prices rose once more; and so on.<sup>325</sup>

Meanwhile, banks continued to have a shortage of cash to meet withdrawals.<sup>326</sup>

However, as alternative forms of money emerged, and the velocity of money accelerated, the real supply of money fell. Towards the end of 1922 this real value of currency in circulation had become less than the value of the gold reserve of the Reichsbank. Similarly, in certain other countries, where the legal currency in circulation fell to very low levels, the gold cover of the notes (the gold being valued according to the foreign exchange), was much greater than in countries where the currency depreciation had not gone to such lengths.

During 1922, the management of the Reichsbank tenaciously refused to allow the gold reserve to be used for monetary reform.<sup>327</sup> Throughout this period the Reichsbank continued to finance government deficits by accepting Reich treasury bills. In fact, as the demand for Treasury bills shrank, the percentage held outside the Reichsbank fell, signaling the final failures of all credit instruments as a storehold of wealth, hence the hyperinflation.<sup>328</sup>

The chart below shows how the role of private banks fell from 1920 to 1923 as banks were faced with liquidity problems and the Reichsbank replaced it by lending directly. Until the summer of 1922 the Reichsbank exercised, almost exclusively, the function of a State bank, discounting Treasury bills presented to it. The increasing needs of trade were satisfied by private banks which could discount directly at the Reichsbank the Treasury bills in which they had largely invested the money of depositors during and after the war.<sup>329</sup>

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<sup>324</sup> Bresciani-Turroni p. 80-82

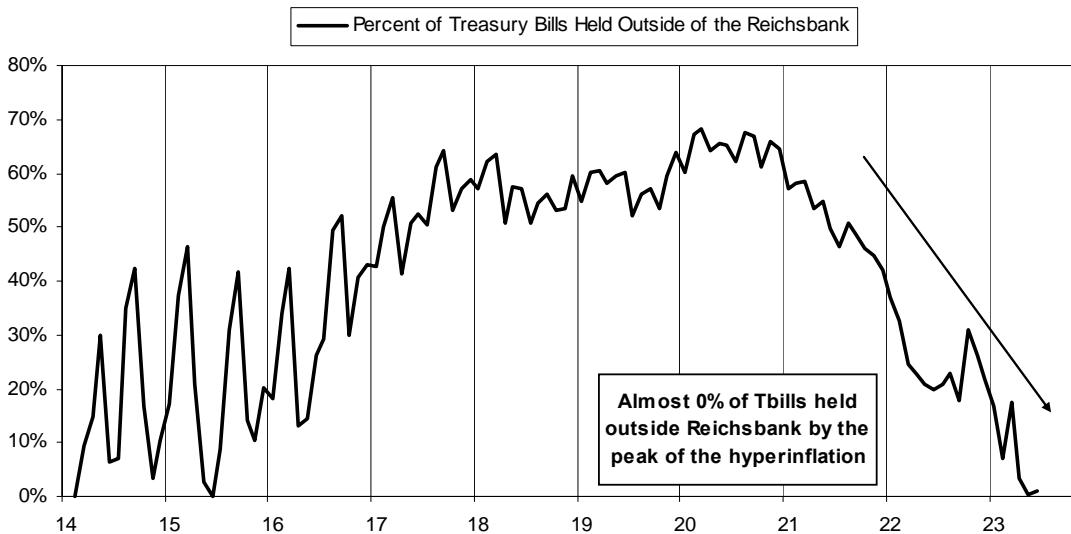
<sup>325</sup> Bresciani-Turroni p. 80-82

<sup>326</sup> Bresciani-Turroni p. 80-82

<sup>327</sup> Bresciani-Turroni p. 46

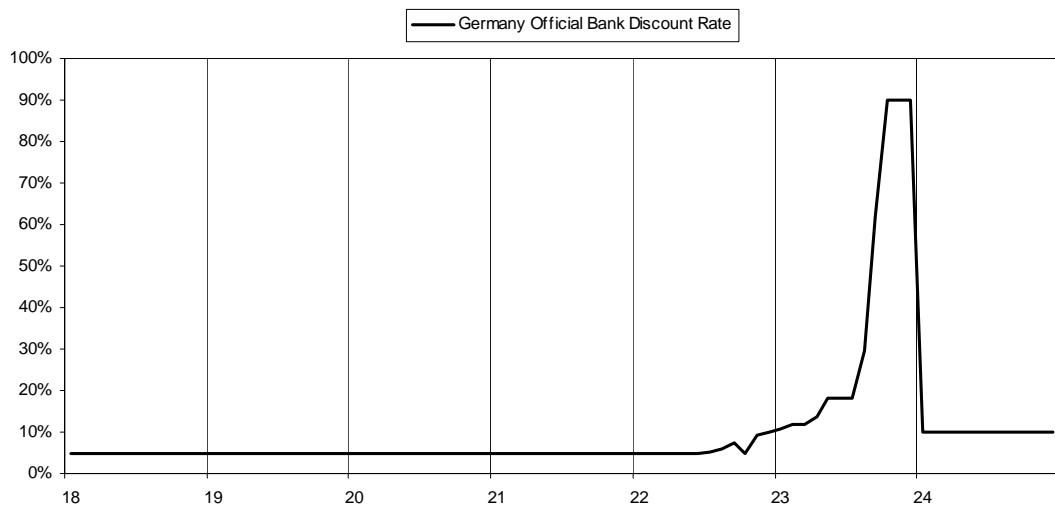
<sup>328</sup> Holtfrerich p. 68

<sup>329</sup> Bresciani-Turroni p. 76



As mentioned, in July of 1922 the Reichsbank began to supply liquidity to businesses—i.e., the Reichsbank allowed big businesses to borrow via commercial bills, which the Reichsbank discounted at a much lower rate than the rate of the depreciation of the mark and even lower than the rates charged by private banks, so essentially a subsidized rate. As a result, these companies could borrow on terms that were essentially the same as the Reich. They even had direct access to the Reichsbank. These moves were quite similar to recent moves by the Fed and motivated by similar reasons.

The official discount rate in Germany remained fixed at 5% from 1915 until July 1922, so as inflation rose, real interest rates fell to very negative levels. The discount rate was raised to 6% at the end of July, to 7% at the end of August, to 8% on September 21, to 10% on November 13, to 12% on January 18, 1923, and to 18% in the last week of April 1923. However, these rates of interest were still all much less than the rate of depreciation in the value of money so they didn't dissuade the borrowing and other shorting of marks. So inflation hedge assets and other currencies continued to rise. For example, a gold mark was worth 160 paper marks at the end of July 1922, 411 paper marks at the end of August, 1,822 at the end of November, and 7,100 at the end of April 1923.<sup>330</sup> However, as conveyed in the following chart, these increases in interest rates were the beginning of a major increase in rates that occurred in 1923.



<sup>330</sup> Bresciani-Turroni p. 76

While the liquidity of the banking system was high during the inflation since money itself was generally so plentiful, in 1922 this changed when a crisis of liquidity at the banks accompanied hyperinflation. See the table that follows. Note how deposits as a percent of the monetary base fell sharply and continuously at banks except for the Joint Stock banks in Berlin.

**Deposits as % of the Monetary Base**

|      | Joint Stock Credit Banks (Berlin) | Joint Stock Credit Banks (Provincial) | Mortgage Banks | Savings Banks | Co-op. Credit Societies | Postal giro Accounts | Total | Total where we have complete data |
|------|-----------------------------------|---------------------------------------|----------------|---------------|-------------------------|----------------------|-------|-----------------------------------|
|      | 1                                 | 2                                     | 3              | 4             | 5                       | 6                    | 7     | 1+4+6                             |
| 1913 | 71%                               | 62%                                   | 12%            | 273%          | 66%                     | 3%                   | 487%  | 347%                              |
| 1914 | 52%                               | 43%                                   | 9%             | 202%          | 46%                     | 3%                   | 355%  | 257%                              |
| 1915 | 58%                               | 41%                                   | 9%             | 171%          | 45%                     | 3%                   | 326%  | 231%                              |
| 1916 | 59%                               | 38%                                   | 6%             | 135%          | 39%                     | 3%                   | 279%  | 197%                              |
| 1917 | 61%                               | 32%                                   | 5%             | 103%          | 31%                     | 3%                   | 236%  | 167%                              |
| 1918 | 45%                               | 24%                                   | 5%             | 73%           | 24%                     | 3%                   | 173%  | 121%                              |
| 1919 | 62%                               | 24%                                   | 4%             | 58%           | 19%                     | 5%                   | 171%  | 125%                              |
| 1920 | 63%                               | 22%                                   | 4%             | 45%           | -                       | 8%                   | -     | 116%                              |
| 1921 | 78%                               | -                                     | -              | 34%           | -                       | 5%                   | -     | 116%                              |
| 1922 | 96%                               | -                                     | -              | 10%           | -                       | 10%                  | -     | 116%                              |

As inflation worsened, bank depositors understandably wanted to be able to get their funds on short notice so they shortened their lending to banks. This is reflected in the following tables<sup>331</sup> which show how over 90% of bank deposits were for seven days or less in 1922–1923 and how over 80% of deposits moved to short-term checking accounts rather than longer-term savings. During inflationary deleveragings, average maturities of debt always fall, so this is typical.

**Deposits at Berlin "Great Banks" by Required Notice of Withdrawal  
% of Total Deposits**

|             | Up to 7 days<br>(current account) | 7 days - 3 months | above 3 months |
|-------------|-----------------------------------|-------------------|----------------|
| <b>1913</b> | 56.8%                             | 29.8%             | 13.3%          |
| ...         | -                                 | -                 | -              |
| <b>1918</b> | 60.6%                             | 26.1%             | 13.1%          |
| <b>1919</b> | 78.1%                             | 14.0%             | 7.8%           |
| <b>1920</b> | 76.7%                             | 15.1%             | 8.2%           |
| <b>1921</b> | 77.1%                             | 15.0%             | 7.9%           |
| <b>1922</b> | 93.0%                             | 4.9%              | 2.1%           |
| <b>1923</b> | 92.6%                             | 3.3%              | 4.0%           |
| <b>1924</b> | 57.5%                             | 40.0%             | 2.5%           |
| <b>1925</b> | 51.5%                             | 44.5%             | 3.9%           |

| Current Account deposits<br>as a Percentage of Total<br>Deposits at Prussian<br>Savings Banks |       |
|---|-------|
| <b>1913</b>   | 0.5%  |
| <b>1914</b>   | 1.0%  |
| <b>1915</b>   | 1.7%  |
| <b>1916</b>   | 2.5%  |
| <b>1917</b>   | 4.1%  |
| <b>1918</b>   | 4.7%  |
| <b>1919</b>   | 5.8%  |
| <b>1920</b>   | 10.1% |
| <b>1921</b>   | 14.9% |
| <b>1922</b>   | 83.0% |
| <b>1923</b>   | 83.7% |
| <b>1924</b>   | 5.1%  |
| <b>1925</b>   | 0.3%  |

Note: Prussian savings banks held two-thirds of total German savings banks deposits.

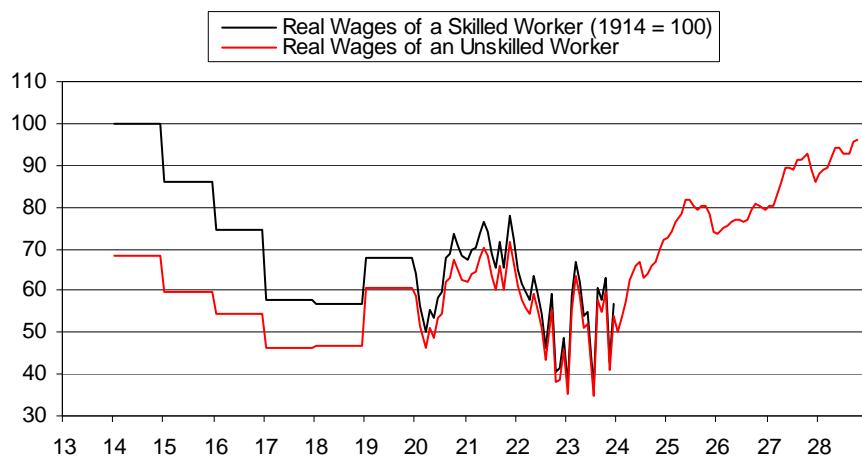
Also, because it had become impractical to transact in marks, foreign currency (especially dollars) replaced the mark as the means of settlement of large transactions, though small transactions continued to be in marks. The economic situation in October 1922, was described by the newspaper *Frankfurter Zeitung*: "German economic life is now dominated by a struggle over the survival of the mark: is it to remain the German currency, or is it doomed to extinction? During the past few months foreign currencies have replaced it as units of account in domestic transactions to a wholly unforeseen extent. The habit of reckoning in dollars, especially, has established itself, not only in firms' internal accounting practice, but above all as the method of price quotation in trade, industry and agriculture."<sup>332</sup> This discussion of the prospects for the mark concludes by emphasizing the degree to which foreign currencies also served as "stores of value", used to protect the real value of money balances.

<sup>331</sup> Holtfrerich p. 58

<sup>332</sup> Holtfrerich p. 74

On October 12, 1922, strictly enforced limits were put on FX purchases making transactions impractical, essentially eliminating foreign currencies as an alternative. Investors who were investing their available resources in foreign exchange to escape inflation once again had to turn to the share market. The shift from foreign money to stocks arising from the decree of October 12 was obvious in that it caused a heavy fall in the supply of foreign exchange<sup>333</sup> and a rise in stock prices suddenly in the second half of October. This dynamic was similar to the frenzied bull speculation in the autumn of 1921.

One of the most important drivers of hyperinflation in the second half of 1922 was wage indexation because it produced a wage-cost spiral. In the second half of 1922, the resistance of the workers to reductions in their real wages increased. The working classes sought to re-establish the earlier level of real wages and to keep them stable, so wages were often indexed to inflation. As a result, the profits which entrepreneurs<sup>334</sup> derived from real wages falling evaporated. As the chart below shows, the real wage declines that occurred in 1921 to late 1922, ended in late 1922 at levels that were down 50% to 75% from pre-war levels, and shot up in 1923.



While the inflation had a devastating effect on the wealth of debt and equity holders and it slashed real wages to workers, it generally helped agile entrepreneurs and the owners of material means of production and strengthened the positions of industrial capitalists.<sup>335</sup> But it was terrible for productivity. For example, the entrepreneur, instead of concentrating his attention on improving the product and reducing his costs often became a speculator in goods and foreign exchanges.

## 1923

### The Occupation of the Ruhr

To make matters worse, on January 11, 1923 France and Belgium occupied Germany's Ruhr valley to capture the German coal, iron and steel production in the Ruhr area. This was supposedly done to gain the money that Germany owed in reparations. France had the iron ore and Germany had coal to make steel, so there had been a history of tensions related to their trade that exacerbated the problem. This aggressive act was a classic case of a debtor/creditor/trading relationship turning antagonistic. This occupation caused the stock market and the currency to plunge. But the currency plunge and the hyper-inflation became so severe that they drove nominal stock prices up. The stock index number of shares increased from 8,981 in December 1922 to 22,400 in January

<sup>333</sup> Bresciani-Turroni p. 270-1

<sup>334</sup> Bresciani-Turroni p. 366-7

<sup>335</sup> Bresciani-Turroni p. 286

1923, and to 45,200 in February.<sup>336</sup> It's a good example of how a bearish development can be so negative for a country's currency that it can cause nominal stock prices to rise.

A pause in the mark's decline occurred when the Reichsbank began its policy of supporting the mark by imposing an artificial exchange rate that linked the mark to the dollar.<sup>337</sup> It did this by issuing its first dollar-denominated treasury certificates. The dollars raised were to be employed by the Reichsbank in an attempt to stabilize the exchange rate. The Reichsbank pledged abroad a good part of the one billion gold marks' worth of gold reserves with which it had started 1923 in order to obtain the requisite foreign exchange for the support action. This "stabilization action" succeeded between February and April. But that policy finished unsuccessfully, as all fixed exchange rates that are pegged inconsistent with the fundamentals inevitably do. That is because the Reich's floating debt rose from 2.1 to 6.6 trillion marks between the end of January and March and the acquiring of further foreign credits reduced Germany's gold reserves to under 500 million gold marks (by the end of 1923). German also had silver stocks—which were not explicitly shown in the Bank's Statements—largely lost in the same period. So in the second half of April 1923, the mark fell again.

It was estimated that this early 1923 failed currency defense cost more than three hundred million gold marks. This defense was abandoned and the dollar rate soared.

There was also a very big redistribution of wealth, from high income earners to low income earners. The next table shows how the distribution of wealth shifted from 1913 to 1923. It conveys that it was not the middle income earners and moderate wealth holders who were affected the most severely by the postwar redistributive processes; it was exclusively the upper income groups. Their losses had less to do with taxes (which did have an adverse affect because they were based on the individual's ability to pay) than with the effect of inflation on the value of the capital assets the wealthy held to store their wealth. The table and charts below show this redistribution of wealth.

| Wealth Category<br>in Gold Marks | Dec-1913             |                | Dec-1923             |                |
|----------------------------------|----------------------|----------------|----------------------|----------------|
|                                  | No. of Taxpayers (%) | Net Wealth (%) | No. of Taxpayers (%) | Net Wealth (%) |
| above 10000 to 20000             | 34.2%                | 7.4%           | 47.5%                | 14.9%          |
| above 20000 to 30000             | 20.4%                | 7.4%           | 19.4%                | 10.5%          |
| above 30000 to 50000             | 19.5%                | 11.0%          | 15.7%                | 13.3%          |
| above 50000 to 100000            | 14.7%                | 14.9%          | 10.6%                | 16.1%          |
| above 100000 to 500000           | 9.8%                 | 27.9%          | 6.1%                 | 25.6%          |
| above 500000 to 1000000          | 0.9%                 | 9.5%           | 0.5%                 | 7.4%           |
| above 1000000 to 3000000         | 0.5%                 | 11.1%          | 0.2%                 | 7.3%           |
| above 3000000 to 10000000        | 0.1%                 | 6.5%           | 0.0%                 | 3.5%           |
| above 10000000                   | 0.0%                 | 4.4%           | 0.0%                 | 1.5%           |
| <b>Total</b>                     | 100%                 | 100%           | 100%                 | 100%           |

Of course, all holders of financial wealth suffered, in varying degrees. The table that follows shows estimates of how much by wealth category.

<sup>336</sup> Bresciani-Turroni p. 270

<sup>337</sup> Bresciani-Turroni p. 271

| Wealth Category<br>in Gold Marks | % Reduction from 1913-1923<br>No. of Taxpayers (%) | Net Wealth (%) |
|----------------------------------|--|----------------|
| above 10000 to 20000             | -18.9%   | -21.7%         |
| above 20000 to 30000             | -44.4%   | -44.9%         |
| above 30000 to 50000             | -53.0%   | -53.2%         |
| above 50000 to 100000            | -57.8%   | -58.0%         |
| above 100000 to 500000           | -63.6%   | -64.4%         |
| above 500000 to 1000000          | -69.4%   | -69.7%         |
| above 1000000 to 3000000         | -73.8%   | -74.6%         |
| above 3000000 to 10000000        | -78.5%   | -79.2%         |
| above 10000000                   | -85.3%   | -86.4%         |
| <b>Total</b>                     | <b>-41.6%</b>                                      | <b>-61.2%</b>  |

The first table above indicates that at December 31, 1923, taxable wealth was more equally distributed than it had been ten years earlier. It also shows that the two lowest wealth classes virtually doubled their share of aggregate wealth, the middle categories increased their share of the total, and the classes above these fell. The second table also indicates that over this ten year period the aggregate value of wealth declined by 61.2%, which was much greater than the 25–30% fall in real national income between 1913 and 1923. That is because (a) the income from capital and (b) the value of capital became a smaller proportion of national income.

The period of most acute and widespread poverty was 1923. Not coincidentally, it was also the year of the highest crime rate. Plunderings and riots became common. To cope with the social unrest which the collapse of the mark had caused, the Reich declared a state of siege on September 27, 1923.<sup>338</sup>

By mid-1923, people were eager for some cash-like vehicle to hold their liquidity in. New forms of credit were invented and desperation made some of them work. In the summer of 1923, when the scarcity of money was most acute, the Berlin banks decided to issue a kind of check which was to be acceptable at their branches and which was also willingly accepted by the public, who were desirous of having any means of payment whatever.

Private firms, industrial companies, combines, and public authorities issued all kinds of provisional money. This was very similar to what happened in other inflationary deleveragings like when the banks became dysfunctional such as in Argentina.

In August 1923, the value of foreign currencies employed in transactions within Germany was almost ten times as great as the value of the paper-mark circulation.<sup>339</sup> So the currency was essentially defunct and all debt denominated in it was extinguished—i.e., marks no longer served a meaningful purpose of either a medium of exchange and as a store of wealth.

In an attempt to satisfy the desperate demand for value-maintaining means of payment, the Reich brought out a five hundred million gold mark loan in August 1923. It was issued in notes of small denomination so that they could be used as means of payment. To support the value of these, the Reich also issued exchange-rate linked treasury certificates—i.e., certificates whose value was effectively denominated in dollars pegged to the dollar exchange rate. The Reich also permitted provinces, municipalities, chambers of commerce and large business firms to issue emergency money denominated in gold marks. Also, some companies borrowed by issuing “loans at a stable value” which were tied to what they produced—e.g., rye farmers issue rye-backed debt.

Because it was impossible to do accounting for, and convey the meaning of, money because its value changed so fast, the accounting system was changed and the practice of valuing things in gold became generally adopted.

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<sup>338</sup> Holtfrerich p. 312

<sup>339</sup> Holtfrerich p. 304

Naturally, there was the almost complete disappearance of bankruptcies in the advanced phases of the inflationary monetary depreciation because debts were easily paid off with paper money.

During the hyperinflation the prices of equity shares generally were determined by investors on the basis of the "intrinsic value" of the companies rather than as multiples on earnings. In the last phase of the inflation (i.e. in 1923), there was a tendency to overvalue shares. Then, after the stabilization of the mark, the prices of shares declined rapidly. The average quotation for December 1923 was 26.9 (1913 = 100).

### *Final Stages of Inflation...*

In the summer of 1923, when the mark was losing value rapidly everybody tried to get rid of marks as soon as they received them. They also tried to short them by borrowing them and converting them into foreign exchange and hard assets. The increase in the velocity of the money in circulation was the expression of the fact that the population lived from day to day without keeping any cash reserves. For example, in Germany it was rare for a retailer or workman to have cash balances that were greater than necessary for two or three days' needs.<sup>340</sup> The risk of transactions affected by payment in paper marks became so great in the summer of 1923 that many producers and merchants preferred not to sell at all rather than to accept money for goods. Some just made their prices so high that people refused to buy the merchandise. In fact, prices in October and November of 1923 were so high that a stoppage of sales was the norm. Business and great shops were deserted. As a result, the personnel who worked in these stores were let go or given less work hours. The drop in sales resulted in a fall in working capital, so production ceased and unemployment increased.

The depreciation of the currency in the early stages stimulated production, but in the late phase it acted as a serious obstacle to production because of the chaos it caused. When the currency depreciation and inflation caused economic collapse instead of economic support, stabilization of the currency became essential.

Ironically, because of both the acceleration in the velocity of money and because it became dysfunctional as a medium of exchange, in August 1923 the value of the paper money in circulation declined to scarcely 80 million gold marks.<sup>341</sup> By this time, the total circulation of "value-maintaining paper money" had grown in excess of the value of paper marks and of various non-value-maintaining moneys in circulation during the final phase of the inflation.

In the summer of 1923, the price of the dollar jumped in the course of a few days to 1, 2, and then 5 million paper marks.<sup>342</sup> In the days preceding the monetary reform the official quotations of the dollar at Berlin were as follows:

| <i>Various official quotes in Berlin for the papermark / USD:</i> |           |
|---|-----------|
| Nov 13 1923   | 840 bln   |
| Nov 14 1923   | 1,260 bln |
| Nov 15 1923   | 2,520 bln |
| Nov 20 1923   | 4,200 bln |

In the black foreign market the dollar reached much higher rates. The rates were more than double these levels.

| <i>In the open foreign market, the following quotes were seen:</i> |            |
|--|------------|
| Nov 13 1923  | 3,900 bln  |
| Nov 15 1923  | 5,800 bln  |
| Nov 17 1923  | 6,700 bln  |
| Nov 20 1923  | 11,700 bln |

The table that follows shows indices for internal prices, imported prices, currency in circulation, floating rate debt outstanding, and the mark/dollar exchange rate. We put it in the table form because it is difficult to read in chart form. As shown, the exchange rate changed the most and changes in it typically led to changes in other things.

<sup>340</sup> Bresciani-Turroni p.166

<sup>341</sup> Bresciani-Turroni p. 174

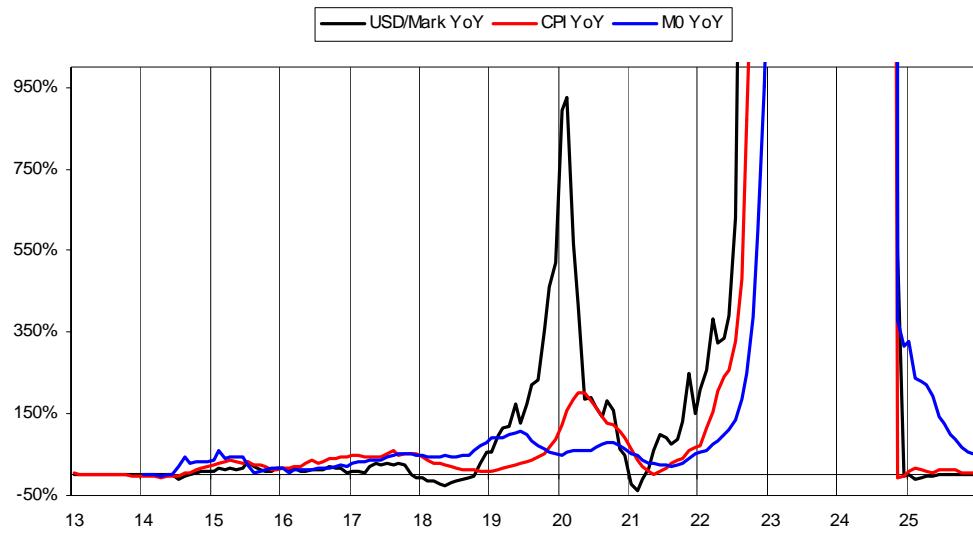
<sup>342</sup> Bresciani-Turroni p. 272

## Price Indices

(Oct 1918 = 100)

|        | Internal<br>Prices | Prices of<br>Imported<br>Goods | Circulation | Floating<br>Debt | Dollar Rate |
|--------|--------------------|--------------------------------|-------------|------------------|-------------|
| Oct-18 | 100                | 100                            | 100         | 100              | 100         |
| Nov-18 | 100                | 100                            | 110         | 106              | 114         |
| Dec-18 | 99                 | 131                            | 124         | 115              | 126         |
| Jan-19 | 108                | 135                            | 129         | 122              | 124         |
| Feb-19 | 112                | 135                            | 132         | 128              | 138         |
| Mar-19 | 114                | 135                            | 139         | 132              | 157         |
| Apr-19 | 120                | 142                            | 144         | 139              | 191         |
| May-19 | 125                | 144                            | 150         | 146              | 195         |
| Jun-19 | 130                | 151                            | 160         | 152              | 213         |
| Jul-19 | 143                | 166                            | 157         | 158              | 229         |
| Aug-19 | 177                | 201                            | 153         | 162              | 285         |
| Sep-19 | 195                | 289                            | 158         | 167              | 365         |
| Oct-19 | 211                | 384                            | 163         | 173              | 407         |
| Nov-19 | 236                | 543                            | 170         | 177              | 581         |
| Dec-19 | 365                | 705                            | 188         | 179              | 710         |
| Jan-20 | 402                | 1,276                          | 191         | 183              | 981         |
| Feb-20 | 506                | 1,899                          | 204         | 185              | 1,503       |
| Mar-20 | 522                | 1,876                          | 223         | 190              | 1,272       |
| Apr-20 | 499                | 1,608                          | 234         | 197              | 905         |
| May-20 | 541                | 1,207                          | 241         | 211              | 705         |
| Jun-20 | 517                | 989                            | 256         | 235              | 594         |
| Jul-20 | 527                | 887                            | 261         | 255              | 598         |
| Aug-20 | 557                | 953                            | 271         | 268              | 725         |
| Sep-20 | 566                | 1,040                          | 284         | 287              | 879         |
| Oct-20 | 541                | 1,088                          | 290         | 292              | 1,034       |
| Nov-20 | 560                | 1,103                          | 290         | 305              | 1,171       |
| Dec-20 | 553                | 945                            | 306         | 317              | 1,106       |
| Jan-21 | 570                | 852                            | 295         | 322              | 985         |
| Feb-21 | 552                | 776                            | 300         | 336              | 930         |
| Mar-21 | 536                | 754                            | 301         | 345              | 947         |
| Apr-21 | 536                | 729                            | 304         | 358              | 964         |
| May-21 | 530                | 712                            | 306         | 366              | 944         |
| Jun-21 | 552                | 745                            | 318         | 384              | 1,051       |
| Jul-21 | 572                | 804                            | 324         | 396              | 1,162       |
| Aug-21 | 800                | 905                            | 333         | 421              | 1,277       |
| Sep-21 | 817                | 1,278                          | 355         | 436              | 1,590       |
| Oct-21 | 935                | 1,676                          | 373         | 452              | 2,276       |
| Nov-21 | 1,241              | 2,647                          | 409         | 470              | 3,987       |
| Dec-21 | 1,326              | 2,371                          | 460         | 512              | 2,909       |
| Jan-22 | 1,415              | 2,372                          | 466         | 531              | 2,908       |
| Feb-22 | 1,574              | 2,711                          | 483         | 545              | 3,152       |
| Mar-22 | 2,103              | 3,488                          | 503         | 564              | 4,309       |
| Apr-22 | 2,503              | 3,834                          | 564         | 583              | 4,412       |
| May-22 | 2,521              | 4,028                          | 608         | 600              | 4,399       |
| Jun-22 | 2,733              | 4,431                          | 677         | 612              | 4,814       |
| Jul-22 | 3,890              | 6,476                          | 761         | 639              | 7,478       |
| Aug-22 | 6,886              | 15,155                         | 943         | 690              | 17,200      |
| Sep-22 | 10,737             | 20,142                         | 1,248       | 932              | 22,211      |
| Oct-22 | 20,736             | 42,227                         | 1,811       | 1,252            | 48,236      |
| Nov-22 | 39,604             | 100,062                        | 2,884       | 1,737            | 108,886     |
| Dec-22 | 53,337             | 113,727                        | 4,847       | 3,098            | 115,093     |
| Jan-23 | 99,321             | 221,496                        | 7,487       | 4,318            | 272,515     |
| Feb-23 | 205,411            | 411,193                        | 13,246      | 7,441            | 423,355     |
| Mar-23 | 187,166            | 318,644                        | 20,748      | 13,687           | 321,349     |
| Apr-23 | 197,903            | 349,018                        | 24,728      | 17,506           | 370,856     |
| May-23 | 294,462            | 635,798                        | 32,131      | 21,307           | 722,792     |
| Jun-23 | 707,813            | 1,456,952                      | 65,106      | 45,660           | 1,667,768   |

Note that in the 1921-23 hyperinflation upswing, the mark's decline led the increase in inflation, and the increase in inflation led the increase in M0 growth.



Source: Global Financial Data, BW Estimates

The evidence shows that the cause of this hyperinflation was described at the time. The following are good descriptions of this dynamic:

#### Halfenrich (economist)

"The depreciation of the German mark in terms of foreign currencies was caused by the excessive burdens thrust on to Germany and by the policy of violence adopted by France; the increase of the prices of all imported goods was caused by the depreciation of the exchanges; then followed the general increase of internal prices and of wages, the increased need for means of circulation on the part of the public and of the State, greater demands on the Reichsbank by private business and the State and the increase of the paper mark issues. Contrary to the widely held conception, *not inflation but the depreciation of the mark was the beginning of this chain of cause and effect*; inflation is not the cause of the increase of prices and of the depreciation of the mark; but the depreciation of the mark is the cause of the increase of prices and of the paper mark issues. The decomposition of the German monetary system has been the primary and decisive cause of the financial collapse."<sup>343</sup>

#### 'Authoritative Writer' from German Press

"Since the summer of 1921 the foreign exchange rate has lost all connection with the internal inflation. The increase of the floating debt, which represents the creation by the State of new purchasing-power, follows at some distance the depreciation of the mark...Furthermore, the level of internal prices is not determined by the paper inflation or credit inflation, but exclusively by the depreciation of the mark in terms of foreign currencies...To tell the truth, the astonishing thing is not the great quantity but the small quantity of money which circulates in Germany, a quantity extraordinarily small from a relative point of view; even more surprising is it that the floating debt has not increased much more rapidly."<sup>344</sup>

#### Government Report

"The fundamental cause of the dislocation of the German monetary system is the disequilibrium of the balance of payments. The disturbance of the national finances and the inflation are in their turn the consequences of the depreciation of the currency. The depreciation of the currency upset the Budget balance, and determined with an inevitable necessity a divergence between income and expenditure, which provoked the upheaval."

<sup>343</sup> Bresciani-Turroni p. 42-5

<sup>344</sup> Bresciani-Turroni p. 42-5

Our examinations of other cases of hyperinflationary periods show that these causes are typical—i.e., that countries with large debts, especially large foreign debts, high dependencies on foreign capital, credit problems and large and growing budget deficits, are much more prone to experience capital flight and currency depreciation, faster monetary base growth, and high inflation rates than countries with balance of payments surpluses.<sup>345</sup>

## Stabilization: From Late 1923 Onward

Now that we've seen how this inflationary deleveraging came about, let's see how it was extinguished. By late 1923 virtually all debts were extinguished by inflation, and there was a great deal of betting on inflation and being short the mark.

Starting in August 1923 there was a feverish attempt to devise a new currency or stabilize the old one. The plans for stabilizing the currency fell into three groups.

- (1) Plans to use taxation policy, a ban on credit, and restrictions on foreign-currency holdings. Along these lines, in August 1923 the government introduced an "index-linked" tax assessment, it issued "value-maintaining loans", it sought to acquire foreign-currency holdings, and it urged banks and the Reichsbank to offer their clients gold-mark accounts, i.e., accounts in which the borrower promises to calculate the value based on the price of gold.
- (2) Plans to return to a gold currency.
- (3) Plans to secure the currency by mortgaging of land or commodities.<sup>346</sup>

On August 14, 1923, the government passed a law that created a Gold Loan of 500 million gold marks. This law contained only this promise: "In order to guarantee the payment of interest and the redemption of the loan of 500 million gold marks, the Government of the Reich is authorized, if the ordinary receipts do not provide sufficient cover, to raise supplements to the tax on capital..." The word "wert-bestandig" which meant "stable-value" was written on the new paper money. And the public accepted and hoarded these notes. In other word, the gold loans seemed to be believed and thus created a vehicle for financial savings. The German monetary law of August 30, 1924, fixed the conversion rate of the new Reichsmark (whose weight in fine gold was equal to that of the old mark) at one trillion paper marks.<sup>347</sup>

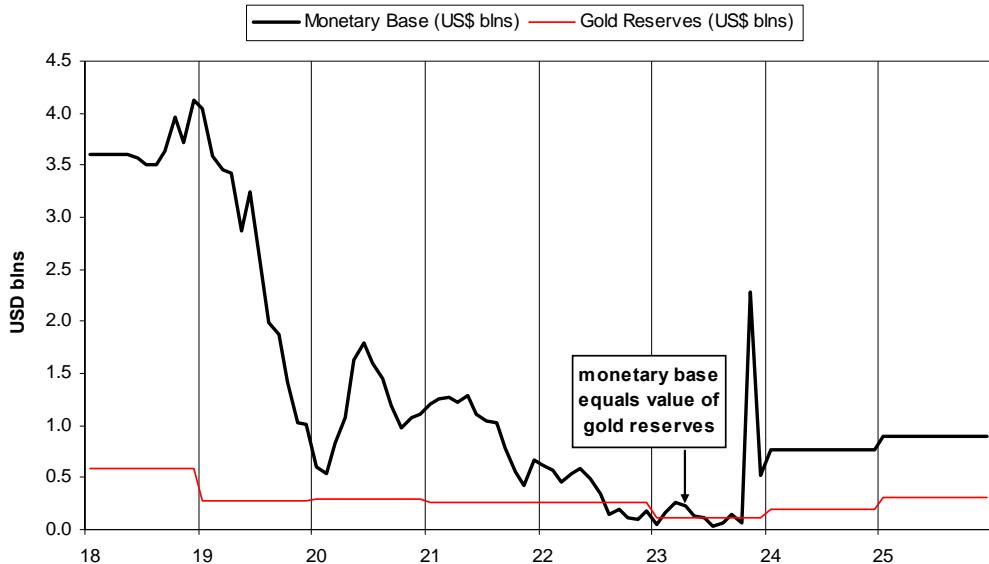
Creating a new currency with very hard backing, and phasing out the old currency, is the most classic path that countries that are suffering from inflationary deleveragings follow in order to end them. On October 15, a decree was issued which instituted a new money, the rentenmark, to begin from November 15, 1923. The key was to issue very little of it and to have it be backed by gold. At this time the money supply was so reduced by the abandonment of marks—e.g., the total amount of floating debt was only 200 million gold marks—that creating a real backing was possible. Towards the end of October 1923 the total sum of paper marks issued in Germany equaled scarcely 150 million gold marks, so they were essentially out of circulation. Going to new currencies with hard currency on gold backings is a classic step in inflationary deleveragings to bring about stability. The chart below shows the monetary base in dollars fell to equal Germany's gold reserves in 1923.

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<sup>345</sup> Bresciani-Turroni p. 42-5

<sup>346</sup> Holtfrerich p. 314

<sup>347</sup> Bresciani-Turroni p. 344-5



The government chose to make the gold value of the new currency identical to that of the prewar mark. Also the government imposed a credit limit of 1.2 billion marks on the new bank's dealings with the private sector—not least in order not to make the Reichsbank wholly redundant—and it reduced the ceiling on credit to the Reich to 1.2 billion marks as well. The “Currency Bank” became the “Rentenbank” and the “rye mark” became the “rentenmark”.<sup>348</sup> The “rentenmark experiment”—i.e., this move to a new, gold-backed currency—met with astounding success. Since the new currency was identical to the former national gold currency, and the government did almost everything in its power to ensure that its value remained stable, it maintained its value. The new currency was almost completely stable from the outset.

The old currency lost its value and the disappeared. The dollar was worth 160,000 paper marks on July 3, 1923, on the Berlin Bourse, 13 million on September 4, and 420 billion on November 20. From then onwards the exchange rate of the dollar remained stable; so also did the ratio of the value between the new rentenmark and the dollar (1 dollar – 4.2 rentenmarks). During 1924 the German and Austrian exchanges were the most stable in Europe.<sup>349</sup>

It was not the decree of the October 15, 1923, but the monetary law of August 30, 1924 (which became effective on October 11, 1924) which sanctioned the legal reduction of the value of the paper mark.<sup>350</sup>

“The miracle of the rentenmark” became a common expression because the improvement occurred so rapidly that people could not easily find an explanation for it.<sup>351</sup>

Some economists attribute the success of the German monetary reform to discontinuing the issuance of paper marks, strict limitations of the quantity of the new money, and the calling-in of paper marks in proportion to the issues of new money. Also, on November 16 the discounting of Treasury bills by the Reichsbank was stopped.

However, the issuing of paper money for commercial purposes continued after November 16. At that date the quantity of paper marks in circulation amounted to 93 million trillion. By November 30 it had already passed 400 million trillion, it reached 496 million trillion on December 31, 690 million trillion on March 31, 1924, 927 million trillion on May 31, and 1,211 million trillion on July 31. At the same time the issues of new rentenmarks increased,

<sup>348</sup> Holtfrerich p.316

<sup>349</sup> Bresciani-Turroni p. 334-5

<sup>350</sup> Bresciani-Turroni p. 334-5

<sup>351</sup> Bresciani-Turroni p. 336-7

and their circulation amounted to 501 million on November 30, 1923, 1,049 million on December 31, 1,760 million on March 31, 1924, and 1,803 million on July 31.<sup>352</sup>

So the introduction of the new currency rentenmark occurred with old marks still in circulation so it was accompanied "by the most colossal monetary inflation ever recorded in the history of the world" in old-mark terms, while the rentenmark was stable. This currency stability might have been due to other countries experiencing similar rapid increases in their money supplies.<sup>353</sup>

Of course, with the abandonment of the old currency, accounting laws had to be changed. On December 28, 1923, a decree compelled industrial companies to compile new balance sheets, valuing their assets and liabilities in "gold marks". With 500 rentenmarks one could obtain at any moment a bond with the nominal value of 500 gold marks, which was guaranteed by a legal mortgage on German property and which yielded a rate of interest at 5 percent in gold (actually payable in paper at the exchange rate of the gold mark.)<sup>354</sup>

Of course, the stability of the value of the rentenmark could not have been due to the possibility of converting the currency into mortgage securities because, at the time, the market value of the mortgage bonds was lower than the nominal value and the market rate of interest was much higher than 5 percent. During 1924 the prices of "stable-value loans" yielded an effective interest of as much as 15-20%. And of course, issuing more rentenmarks would add to the Government's burden on interest on mortgage bonds, for which the public would exchange increasing quantities of rentenmarks.<sup>355</sup> However, as shown in the chart on page 26, interest rates were raised dramatically which changed the economics of borrowing and lending in marks. The lack of confidence in the paper mark gradually lessened and, as a result, consumers, producers, and merchants ceased to be preoccupied with the necessity of reducing their holdings of paper marks to a minimum. As a result, after the stabilization of the mark exchange in November 1923, the velocity of paper mark circulation declined. In other words, the money supply could rise and velocity could drop because of increased confidence in marks for saving.

At the same time the Reichsbank energetically set about eliminating the illegal emergency monies from circulation. The government also fixed wages.<sup>356</sup>

As the mark gained credibility as a medium of exchange, foreign currencies were turned in for it. This showed up in the balance sheets of the Reichsbank, which showed a continuous and noticeable rise in the item "other assets," in which, as experts know, was that foreign exchange. According to the balance sheets of the Reichsbank, "other assets" amounted to 18.8 million gold marks on November 15, 1923, 285.8 million on January 7, 1924, 702.3 million on June 30, and 1,183 million on October 31, 1924.<sup>357</sup> It also appears that those who were short it in various forms got squeezed, adding to the upward pressure on it.

Nonetheless, the stability of the German exchange rate gave way in February and March 1924 as the credit policy of the Reichsbank was not strict enough, and symptoms of a new "inflation" appeared in the first quarter of 1924.<sup>358</sup> However, on April 7, 1924, the Reichsbank, now convinced that it was heading for a fresh inflation, which would cause a new depreciation of the paper mark and the rentenmark, decided to restrict credit severely, which worked. The shortage of marks caused a supply of hoarded foreign exchange to come to the market for sale for marks. At the same time the demand for foreign exchange on the Berlin Bourse declined considerably.<sup>359</sup>

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<sup>352</sup> Bresciani-Turroni p. 336-7

<sup>353</sup> Bresciani-Turroni p. 338

<sup>354</sup> Bresciani-Turroni p. 340-1

<sup>355</sup> Bresciani-Turroni p. 340-1

<sup>356</sup> Bresciani-Turroni p. 348-9

<sup>357</sup> Bresciani-Turroni p. 348-9

<sup>358</sup> Bresciani-Turroni p. 351

<sup>359</sup> Bresciani-Turroni p. 352

The decree of February 14, 1924, "revalued" some debts i.e., required debtors to give creditors more than their face value. For example, debentures and mortgages were revalued at about 15 percent of their original gold value. Mortgage bonds, savings bank deposits, and obligations arising from life assurance contracts were revalued at a rate corresponding to the revaluation of mortgages and other claims held by the Land Credits Institute, assurance companies, and savings banks.

The decree of February 14, 1924, was a good concept but it ran into some problems in application. Creditors had lost virtually all value to inflation and were angry about how their trust was abused, and the government wanted to renew the rewards for lending, which was the intention of this plan. Creditors induced the German Government to announce a new plan which became law on July 16, 1925. The chief provisions of the new law were as follows: (a) The normal rate of revaluation of mortgages was raised to 25% of the original gold value, (b) the law applied to extinct mortgages, if the creditor had accepted the reimbursement with a reservation, (c) for mortgages taken up after June 15, 1922, the law had retroactive effect even if the reimbursement had been accepted without reservation, (d) the payment of sums due on the basis of this law could be demanded after January 1, 1932: in the meantime debtors paid interest at 1.2% after January 1, 1925, 2.5% after July 1, 1925, 3% after January 1, 1926, and 5% after January 1, 1928, (e) the debtor could obtain a reduction in the rate of revaluation to 15% in cases of straitened economic conditions, (f) those who had bought industrial debentures before July 1, 1920, received (besides 15% of the gold value of the security) a small share in the dividends of the company, (g) for securities taken up after January 1, 1918, there was used, as a coefficient for the transformation from paper value to gold value, an average between the dollar exchange rate and the index number of wholesale prices. Just as debt reductions have the effect of easing credit, weakening the currency and increasing inflation (or lessening deflation), debt revaluations tighten credit, support currencies and lower inflation.<sup>360</sup>

Under the Loan Redemption Act that came into force on the same day, July 16, 1925, as the Revaluation Act, certain holders of public bonds gained a revaluation, as they had not under the Third Emergency Tax Decree.<sup>361</sup>

Throughout 1924, the supply and demand for foreign exchange were largely dependent on the credit policy of the Reichsbank. The connection between the abundance of credit and the depreciation of the exchange rate in the first quarter of 1924, which was followed by the tightening of credit and strengthening of the mark in the succeeding months, was obvious and confirmed the ideas of the Quantity Theory.

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<sup>360</sup> Bresciani-Turroni p. 322-4

<sup>361</sup> Holtfrerich p. 327

On October 15, 1923, the German government took the step of completely suspending loans for "Passive Resistance". These excessively generous subsidies, which were granted by the German government, were the principal cause of the enormous deficit in 1923, so eliminating them reduced the budget deficit. Also in the autumn of 1923, the German government tried to free the budget temporarily from the burden of reparations by putting the burden on to private industry. On November 23, 1923, the "Micum" (Mission Interalliée de Controle des Usines et des Mines) and the leading heavy industries concluded an agreement about the supply of coal on reparations account.<sup>362</sup> This fiscal tightening also supported the currency and helped to reduce inflation.

Control over the foreign exchange market was gradually relaxed—e.g., the "Foreign Exchange Commissioner" ceased to function. However, certain restrictions (based on the decrees of October 31 and of November 8, 1924) remained. They (a) specified the process for making foreign payments (which had to be done through an authorized bank), (b) prohibited forward contracts in foreign exchange (c) prohibited the buying or selling of foreign exchange at a higher rate than the official rate in Berlin, and (d) required banks to furnish the authorities with information on foreign exchange business concluded in their own names or for a third party.

Whenever the Rentenbank gave direct loans, it imposed the so-called "constant value clause" which required the borrower to repay them in gold marks.

According to a new law that was passed August 30, 1924, and effective on October 11, 1924, a new German currency called the "reichsmark" was created. Its value was set at 1 reichsmark = 1 trillion paper marks, and 1 reichsmark = 1 rentenmark. The old paper mark was then completely withdrawn from circulation and ceased to be legal tender on June 5, 1925. The transition to a stable German currency was complete.

The gold content of the reichsmark was the same as that which was fixed for the old mark set on March 14, 1875 (1,392 marks = 500 grams of fine gold). The system established after November 1923 continued, so the old notes circulated internally but remained unconvertible. Through this process, the German monetary system was essentially on a dollar exchange standard.<sup>363</sup>

The Reich budget was quickly balanced to everyone's amazement. This occurred via: (a) the strict cutting down of expenses, and (b) the introduction of new taxes and the revaluation of existing taxes and tariffs. The expenses of civil administration were reduced by dismissing a great number of employees. The laws passed on October 15 and November 23 that were previously mentioned had a big effect. But other moves also helped. In Germany, after the war, the heaviest item in the Reich expenditure was the service of public loans. Of the 17.5 billion marks estimated expenditure for the financial year 1919, interest on loans of the Reich represented a good 10 billion. But the monetary depreciation caused the pre-war debt and debts contracted during and after the war to disappear almost completely. To deal with this, the consolidated debt of the Reich (58.5 billion gold marks) was entirely annulled, and the floating debt in paper marks, which amounted to 197 trillion paper marks on November 15, 1923 was paid by the transfer to the Reichsbank of 197 million rentenmarks lent by the Rentenbank with the Reich not paying any interest on this.<sup>364</sup>

Once the exchange rate was stabilized, the yield of taxes increased rapidly primarily because of increased tax revenue arising from the economy's improvement. Tax revenues rose from 14.5 million gold marks in October 1923 to 63.2 millions in November, 312.3 millions in December 1923, and to 503.5 millions in January 1924. Thanks to this marked increase in receipts and controls on spending, the budget was balanced in January 1924, for the first time since the outbreak of the war.<sup>365</sup>

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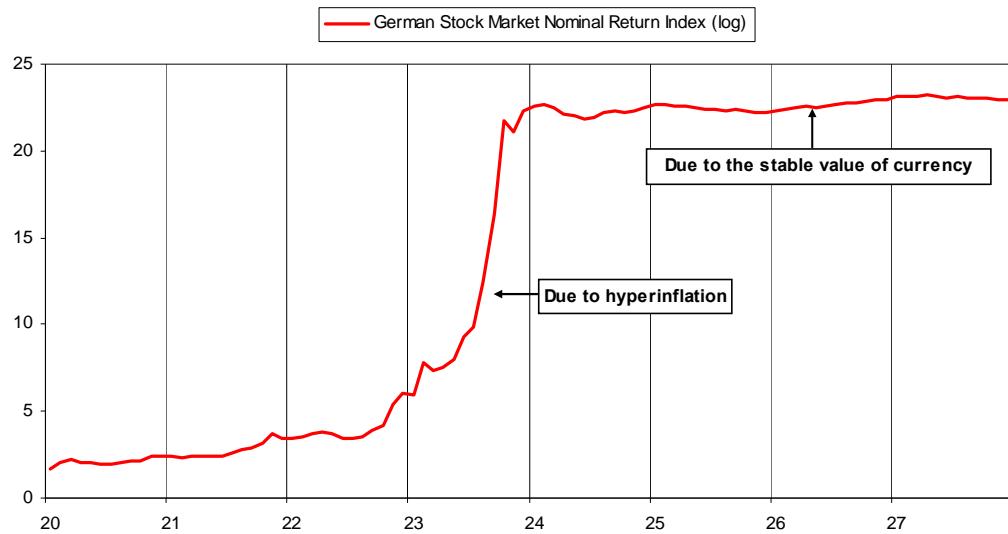
<sup>362</sup> Bresciani-Turroni p. 355-7

<sup>363</sup> Bresciani-Turroni p. 353-4

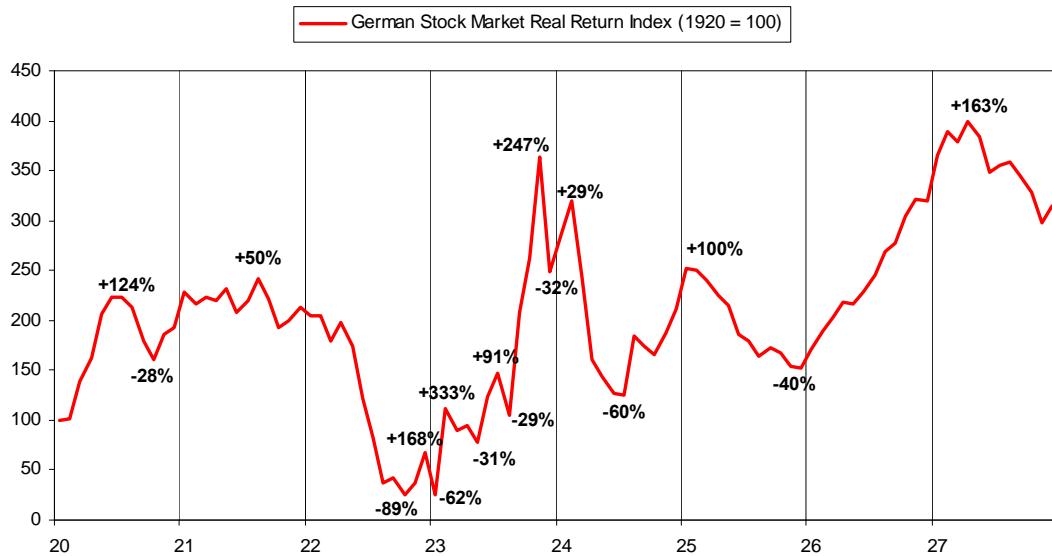
<sup>364</sup> Bresciani-Turroni p. 355-7

<sup>365</sup> Bresciani-Turroni p. 355-7

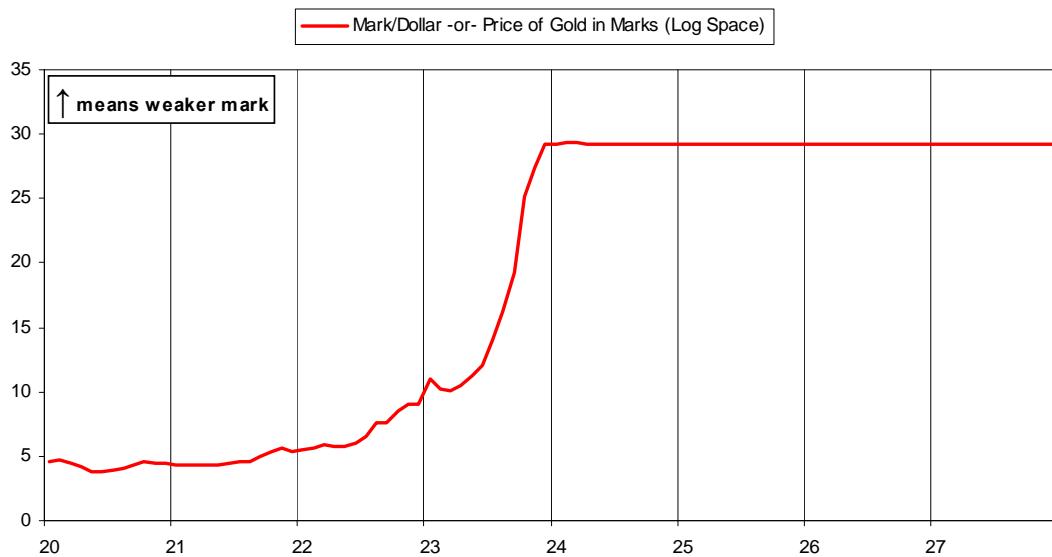
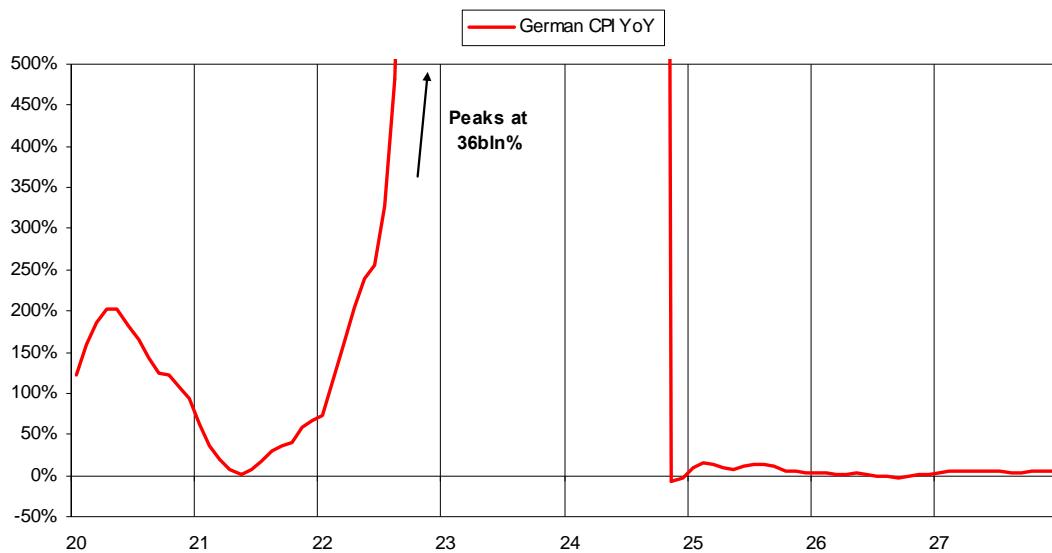
The charts below show (1) the real and nominal stock market, (2) the Y/Y CPI, (3) M0, the velocity of money and total credit, and (4) the exchange rate; and (5) industrial production from 1920 though 1927.



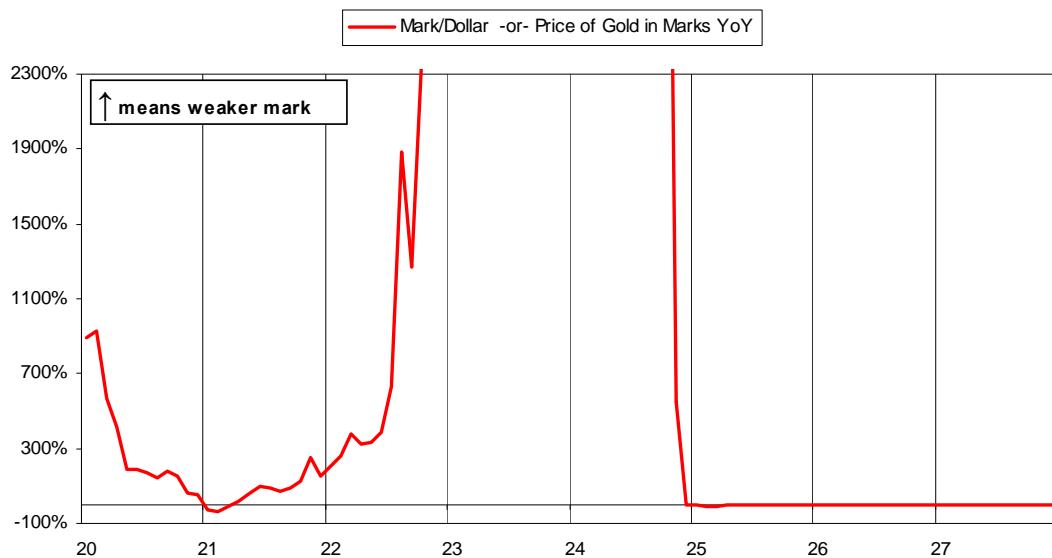
Source: Global Financial Data, BW Estimates



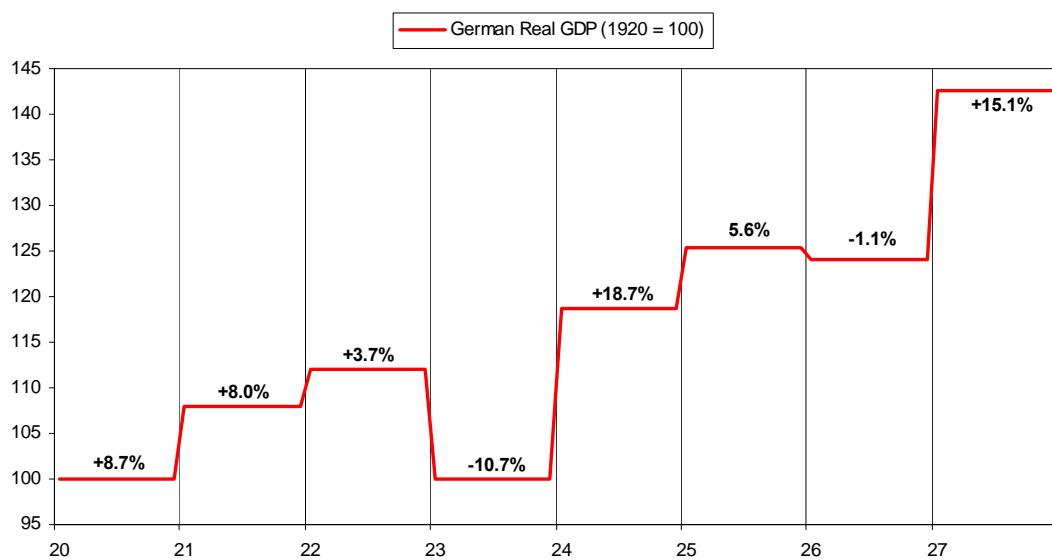
Source: Global Financial Data, BW Estimates

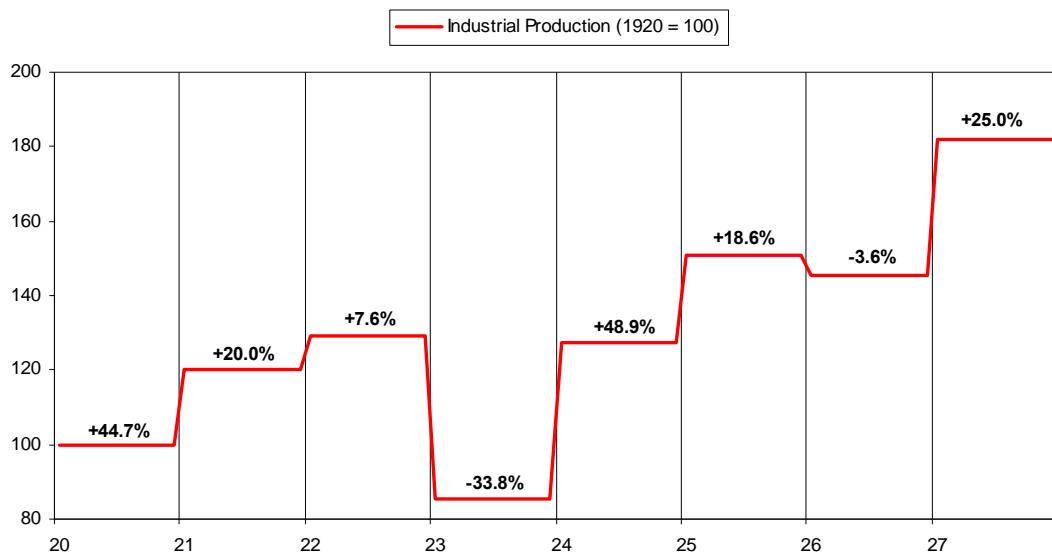


Source: Global Financial Data, BW Estimates



Source: Global Financial Data, BW Estimates





One of the common characteristics of countries that stabilized their currencies and controlled their inflations after an extended period of rampant inflation has been a lack of working capital and a high rate of interest.<sup>366</sup> That set of circumstances existed in Germany through most of 1924.

Until August 23, 1926, the Reichsbank kept the exchange rate of the dollar steady in German marks. In the financial year 1924–25, there was a considerable surplus of receipts over expenses.

During the years between 1925 and the financial crisis of 1931 the fluctuating amounts of foreign loans were the main driver in determining the value of the mark in terms of other currencies. For long periods, the persistent supply of foreign exchange arising from long or short-term loans had the effect of maintaining an exchange rate favorable to Germany. Also, the Reichsbank was able to replenish its gold reserves rapidly.

Through numerous banks that were created by the Reich itself, funds which had accumulated in the Reich or State Treasuries were lent to German business generally as short-term loans, though the Reich and States often granted special long-term loans to industry and agriculture. The government also invested money in the purchase of firms and industrial shares.

Also, tightening credit to make it profitable to be long the currency and painful to be short it is a classic means of stabilizing the currency and lowering inflation. This happened in Germany at the time. While interest rates rose slower than inflation early in the upswing in inflation, interest rates rose faster than inflation at the end. In December 1923, complete confidence in German money was not yet re-established and the premium for the risk of depreciation remained high. According to the statements of a well-known banker, the interest rate on overnight paper mark loans in December 1923 was typically not lower than 3–5% per month. On the other hand, for rentenmark loans (which had a clause that guaranteed the lender against the risk of the depreciation of the rentenmark itself), interest was 1–1.5% per month. This interest rate shows that the guarantee was given some credence (which is why the interest rate was lower than the paper mark rate), but not discounted as being certain (which is why the rate was still high). During 1924, the highest rates of interest occurred in April and May. Interest rates rose to very high levels that produced a high premium relative to the expected future depreciation of the currency.<sup>367</sup>

<sup>366</sup> Bresciani-Turroni p. 359–61

<sup>367</sup> Bresciani-Turroni p. 359–61

This tightening was reflected in the divergence between the official discount rate and the market rate. In normal times the market rate was lower than the rate fixed by the Reichsbank, but in 1924 the situation was reversed<sup>368</sup> because money was so tight. After the stabilization of the mark and the monetary reform of November 1923, the shortage of capital became really serious causing those who had bet on the mark's depreciation to be squeezed. For example, those who borrowed marks to buy inflation hedge assets were squeezed as borrowing costs and the mark rose at the same time as the prices of inflation hedge assets fell.<sup>369</sup>

While in late 1923 inflation was practically the only form of taxation and it weighed almost exclusively on capitalists, workers, and private and Government salaried employees, after stabilization that all changed. Those penalized by the inflation benefited and high direct taxes became effective.

As the profits from inflation disappeared, the tremendous waste of inflation hedge activities became apparent and those who engaged in them lost a lot. Numerous entrepreneurs who had bought firms with debt lost everything when the currency was stabilized.<sup>370</sup> Due to the insufficiency of working capital and the fall in inflation hedging activities, industries reduced their demands for instruments of production to free up working capital. For example, during the period of inflation, there was the accumulation of stocks of unsold coal and iron, but after it subsided, these were dumped at losses. "The prosperity of the industries consuming coal, which had been dependent on the inflation, caused rapid development of all the mines,"<sup>371</sup> but with the stabilization now in place, the mining industry found itself heavily burdened with very small or negative returns, and those that produced coal of poor quality found that it was no longer saleable. Between the end of 1923 and October 1925, 63 mines in the Ruhr area were closed.<sup>372</sup> One report at the time described the situation as follows: "We have some very extensive factories which are nothing but *rubbish*. It is not sufficient, if we wish to restore our business, to close these establishments, in the hope of reopening them later. Even factories not working cost money...Therefore our slogan must be: Demolition!" It was estimated that three quarters of the existing plant in shipyards was useless. More than a hundred thousand bank employees were discharged during 1924 and 1925.<sup>373</sup>

On the other hand, goods for direct consumption were very scarce at the beginning of 1924. While the industries producing instruments of production and raw materials were in a crisis, broadly speaking, industries that produced goods for direct consumption, or the raw materials especially used by these industries did well. During 1925, the deleveraging of share prices was especially marked for the mining and iron and steel industries, and for some branches of the engineering trade such as that of making railway goods. It was felt less by industries that produced direct consumption goods, such as textiles and beer. Stocks fell, especially in industries that did relatively well in inflation.<sup>374</sup>

One of the immediate and most typical consequences of the monetary stabilization was the sudden rise in the purchasing power of the working class. While rent controls and inflation had made the working class' expenditures on rent practically disappear by 1923, after the stabilization rents were raised rapidly. As rents rose, it became economic to build houses to rent out, and for those who had rented to own instead. While during the period of inflation the building trade was practically limited to the building of mansions for the newly rich who were profiting from the monetary depreciation, in 1924 there was a revival of the building of houses for the working and middle classes.<sup>375</sup>

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<sup>368</sup> Bresciani-Turroni p. 359-61

<sup>369</sup> Bresciani-Turroni p. 366-7

<sup>370</sup> Bresciani-Turroni p. 366-7

<sup>371</sup> Bresciani-Turroni p. 366-7

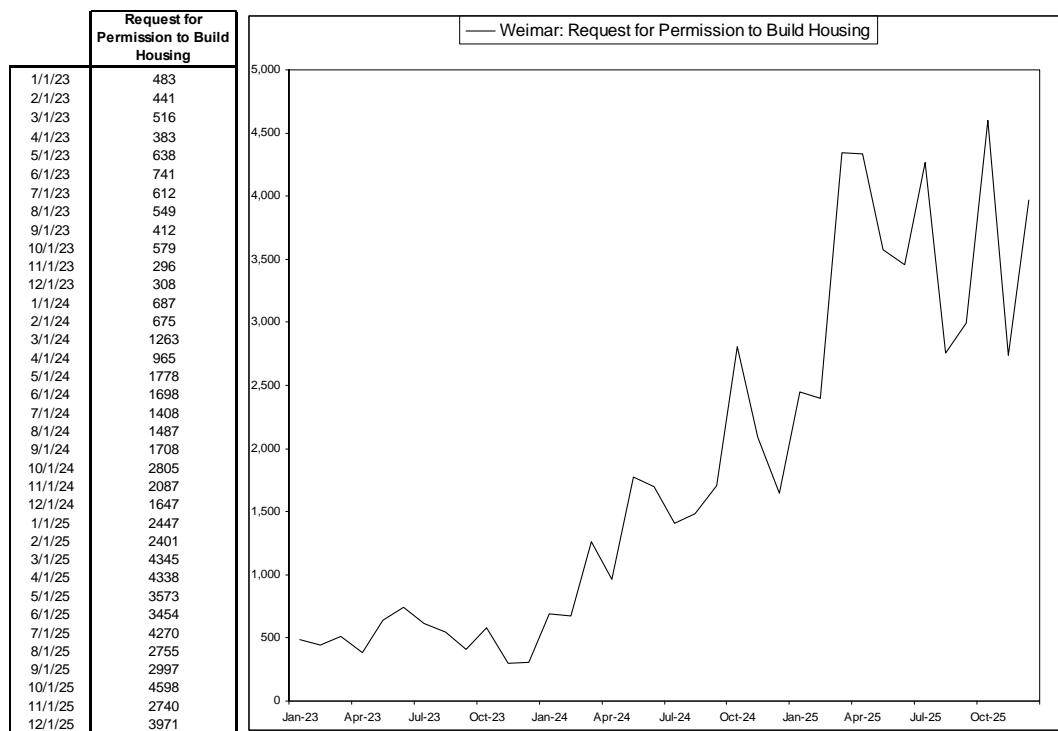
<sup>372</sup> Bresciani-Turroni p. 369-70

<sup>373</sup> Bresciani-Turroni p. 390-1

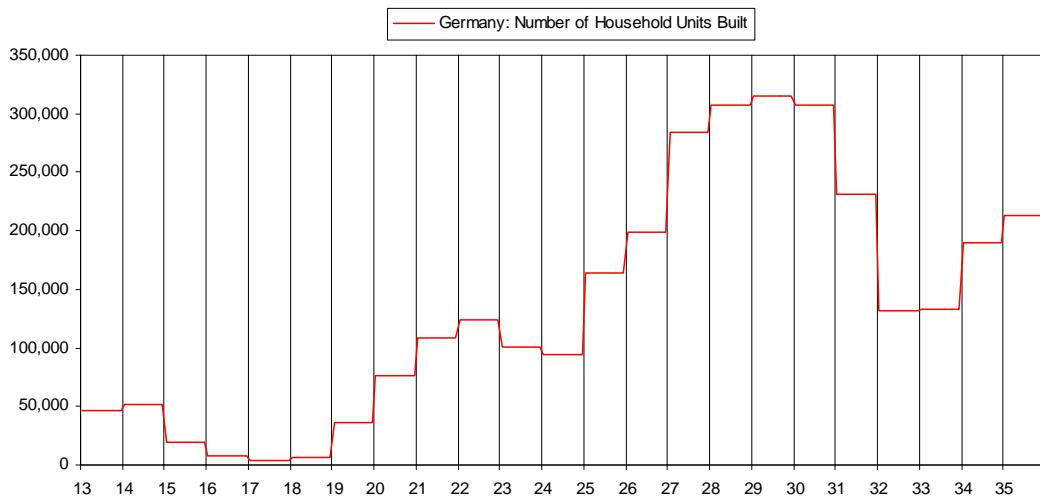
<sup>374</sup> Bresciani-Turroni p. 370

<sup>375</sup> Bresciani-Turroni p. 381

The chart below shows how housing construction accelerated started in 1924.



As shown below, this boom in housing continued until the bubble burst in 1929 and the 1930's deleveraging began.



Labor productivity also increased rapidly after stabilization. For example, it was reported that in June 1926 in the Ruhr coal area, 389,037 employees produced more coal, and of better quality, than was produced by 581,054 in 1923.<sup>376</sup>

<sup>376</sup> Bresciani-Turroni p. 392

There was a big increase in wages in the first months of 1924 as wage restrictions were lifted and there was a reaction against the excessively low wages which had been fixed at the beginning of the monetary stabilization.

During 1924 the big increase in the average income of workers was the combined effect of the rise in wage-rates and the fall in unemployment. But from 1925 to 1928 the general movement of workers' incomes was principally influenced by the rise in wage-rates rather than increased employment. For example, while in June 1925 the monthly unemployment rate was 4.6% of the members of trade unions and the index of workers incomes was 110.8, in June 1928 the percentage of unemployed was 7.5%<sup>377</sup> and the index of workers' incomes rose to 124.

As domestic money and credit was tight and there was a need for it, the German industrialists drew on their reserves of foreign exchange, which they had deposited in foreign banks during the depreciation of the mark. Besides helping to stabilize the mark and contain inflation, it supported business activity.

Both the government and the Director of the Reichsbank agreed that the stabilization of the value of the currency was a necessity which should have precedence over any other matter.<sup>378</sup>

As a result of this stable currency policy, German foreign trade in 1924 and 1925 was characterized by an enormous increase in imports of food and unprocessed goods, while there was no growth in manufactured goods imports (see below). In 1924 and 1925, exports remained stationary.<sup>379</sup>

#### **Imports of Unprocessed Goods, Beverages, and Livestock**

|               | <b>Millions of Gold Marks</b> | <b>% of Total Imports</b> |
|---------------|-------------------------------|---------------------------|
| <b>1913</b>   | 3,095                         | 29%                       |
| <b>1923</b>   | 1,228                         | 20%                       |
| <b>1H1924</b> | 1,078                         | 24%                       |
| <b>2H1924</b> | 1,691                         | 36%                       |
| <b>1925</b>   | 1,949                         | 31%                       |

#### **Imports of Fully Manufactured Goods**

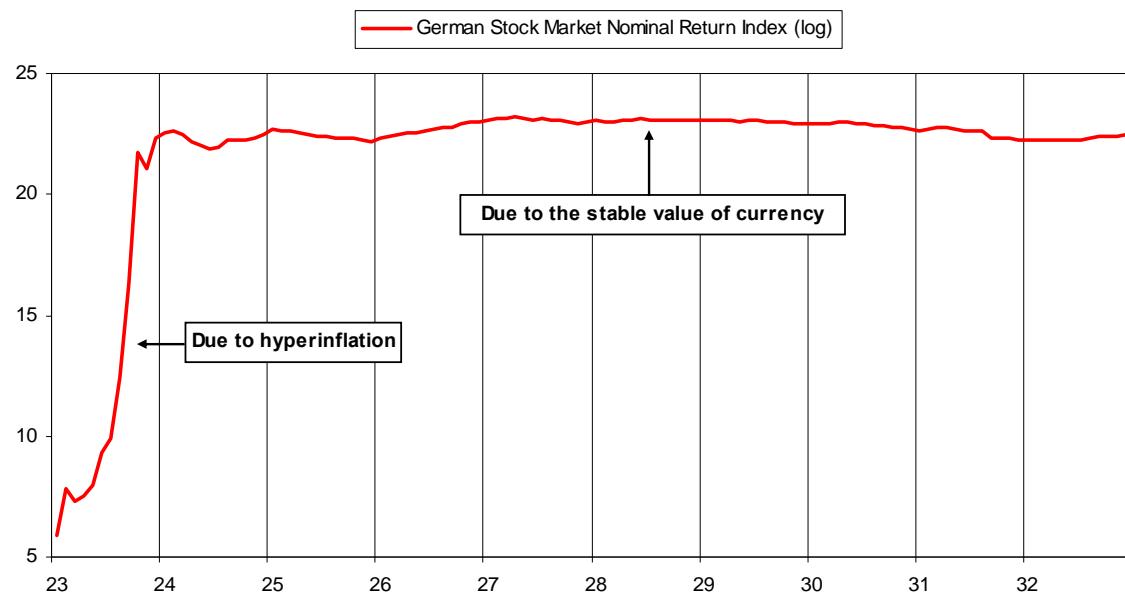
|               | <b>Millions of Gold Marks</b> | <b>% of Total Imports</b> |
|---------------|-------------------------------|---------------------------|
| <b>1913</b>   | 1,413                         | 13%                       |
| <b>1923</b>   | 822                           | 13%                       |
| <b>1H1924</b> | 924                           | 21%                       |
| <b>2H1924</b> | 857                           | 18%                       |
| <b>1925</b>   | 1,069                         | 17%                       |

Though I will not continue this chronology beyond 1925, I have included the following charts to convey the picture of what happened in Germany into the Great Depression in 1932. As the previous chronology of the Great Depression includes a description of Germany until 1938, those who are interested in how this operatic drama continued through then can pick up the story there. The charts below show (1) the nominal and real stock prices, (2) the mark/dollar exchange rate and the price of gold in marks, (3) the inflation rate and changes in M0, and (4) the growth rate of industrial production from 1923 through 1932.

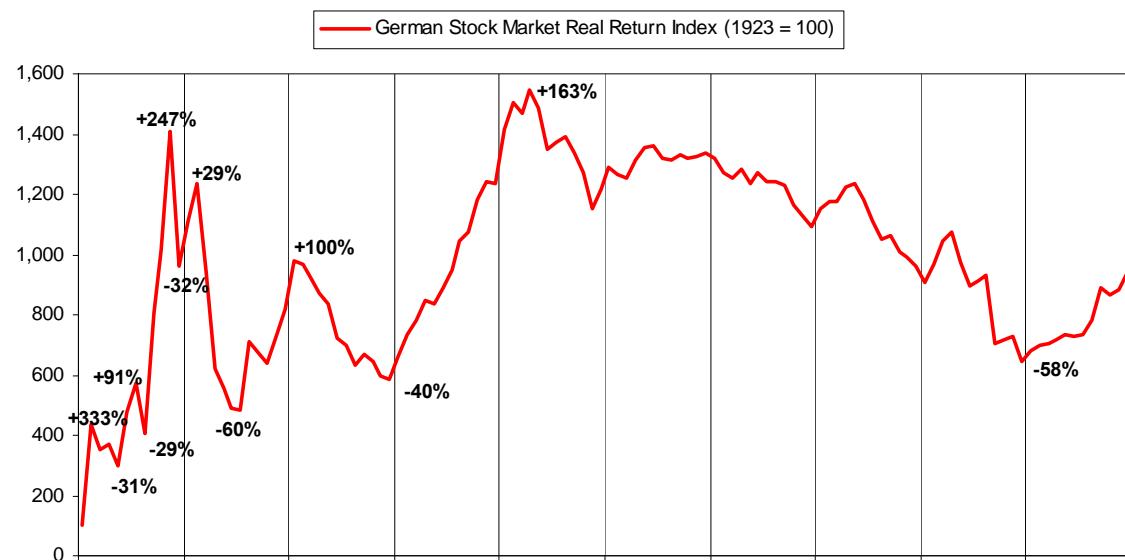
<sup>377</sup> Bresciani-Turroni p. 396

<sup>378</sup> Bresciani-Turroni p.384-5

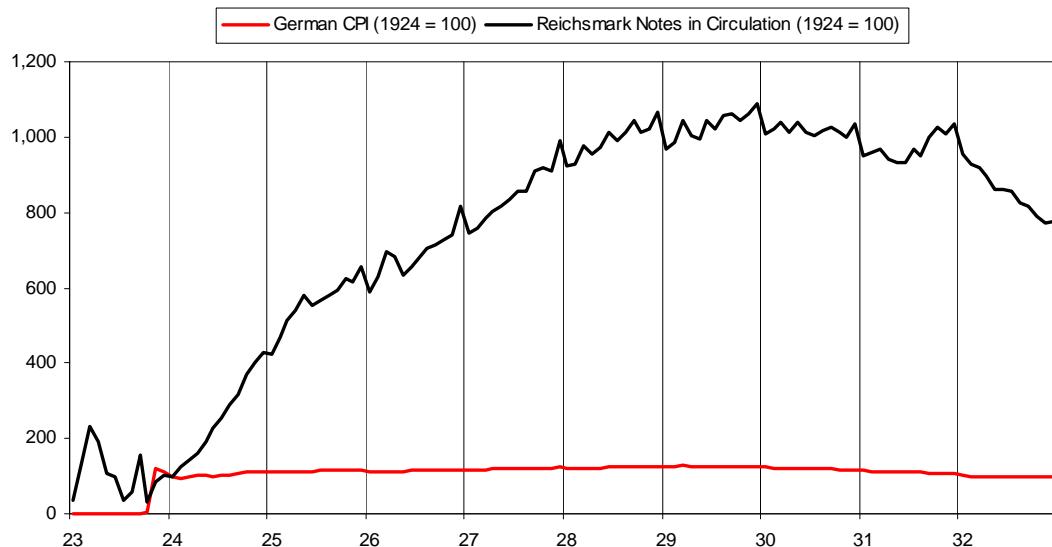
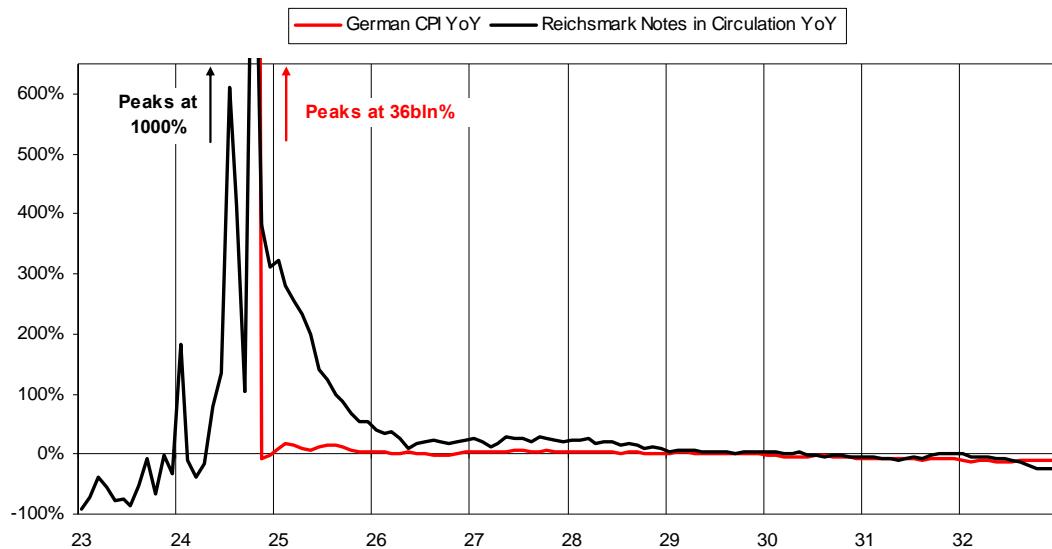
<sup>379</sup> Bresciani-Turroni p. 386



Source: Global Financial Data , BW Estimates

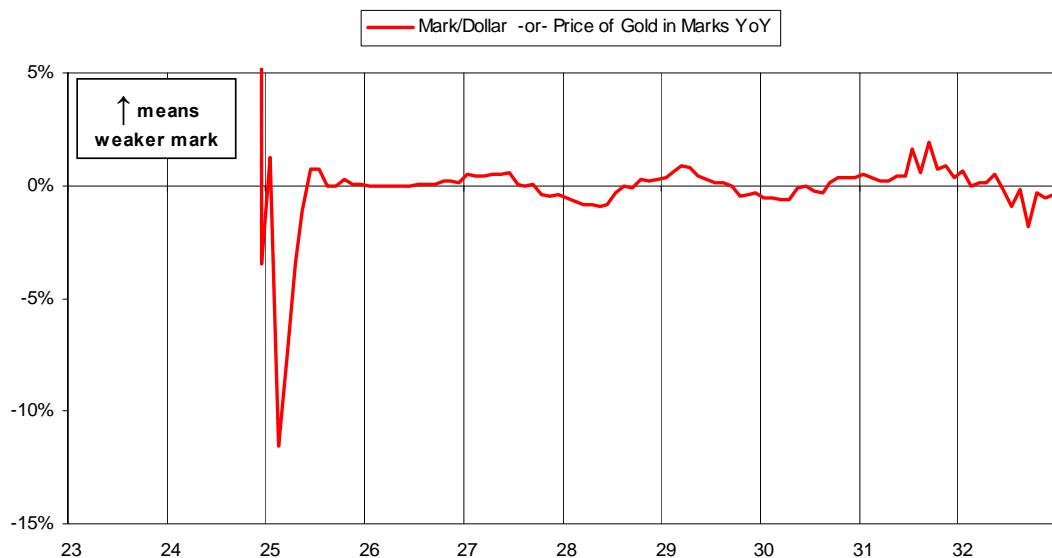


Source: Global Financial Data , BW Estimates

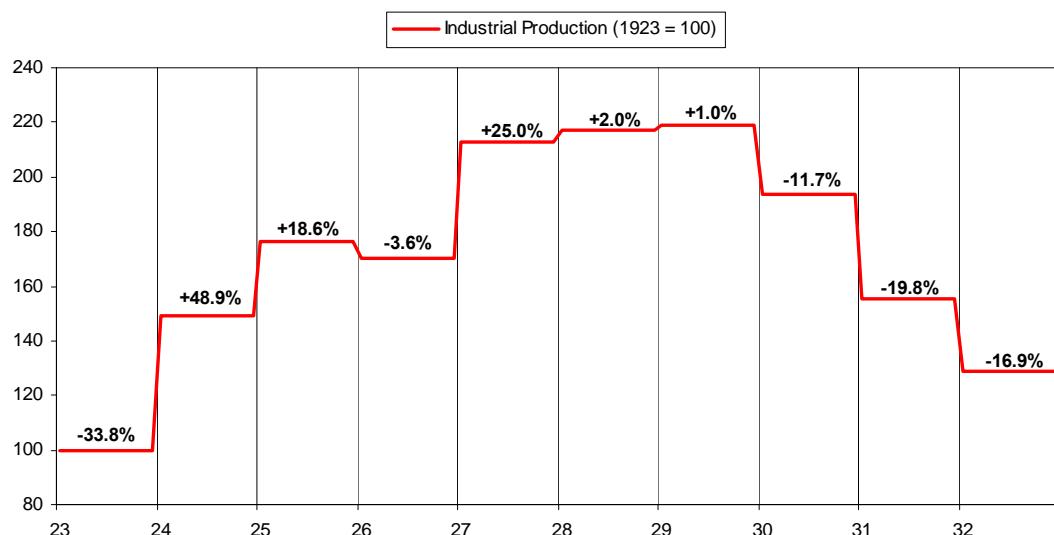
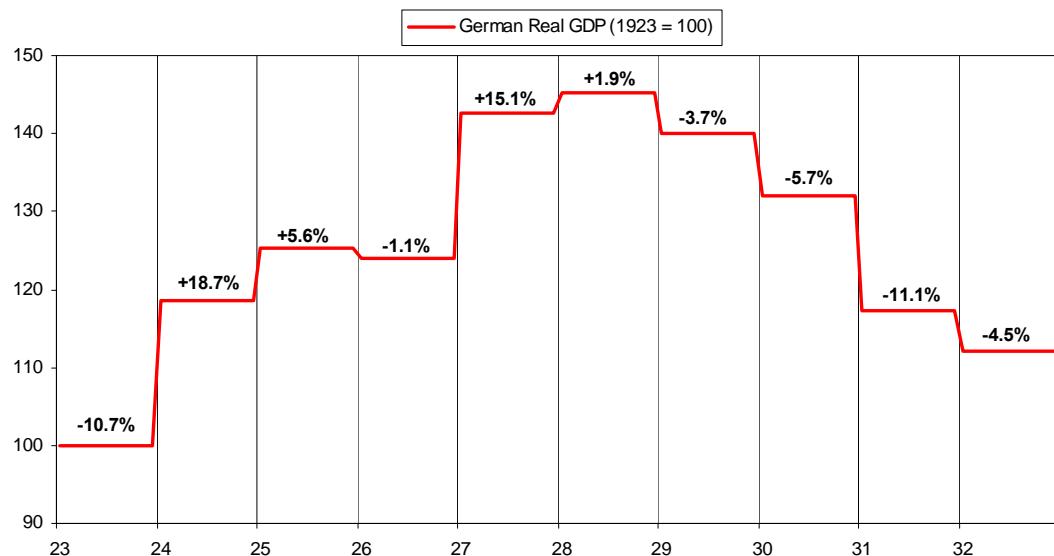




Source: Global Financial Data, BW Estimates



Source: Global Financial Data, BW Estimates



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| Banco Central do Brasil                    |  |
| Central Bank of Thailand                   |  |
| The Central Bank of the Russian Federation |  |
| Bank of Japan                              |  |

# Productivity and Structural Reform: Why Countries Succeed & Fail, and What Should Be Done So Failing Countries Succeed

by Ray Dalio

In this section the drivers of productivity are shown and are used to create an economic health index. That index shows how 20 major countries are doing as measured by 19 economic health gauges made up of 81 indicators, and it shows what these gauges portend for real GDP growth in each of these countries over the next 10 years. As you will see, past predictions based on this process have been highly reliable. For this reason this economic health index provides a reliable formula for success. By looking at these cause-effect relationships in much the same way as a doctor looks at your genetics, blood tests and regimes for exercise and diet, we can see each country's health prospects and also know what changes can be made so that these countries can become economically healthier.

We are making this research available in the hope that it will facilitate the very important discussions about structural reforms that are now going on and will help both the public and policy makers to look past their ideological differences to see the economy as a machine in much the same way as doctors see bodies and look at the relationships of cholesterol and heart attacks analytically rather than ideologically.

## The Template

This section is presented in three parts:

- In Part 1, "The Formula For Economic Success," we show how indicators of countries' productivity and indebtedness would have predicted their subsequent 10-year growth rates going back 65 years, and how these economic health indicators can be used to both predict and shape the long-term economic health of countries. By knowing the linkages between a) indicators of productivity such as the costs of educated people, the amount of bureaucracy in the government, the amount of corruption in the system, how much people value working relative to enjoying life, etc., and b) the subsequent 10-year economic outcomes, policy makers can decide how to change these determinants to affect long-term outcomes.
- In Part 2, "Economic Health Indices by Country, and the Prognoses that They Imply" we show each of the 20 countries' economic health indices by component and aggregated, and how these lead to the projected growth over the next 10 years. In this section you can see a synthesis for each country based on an objective review of each of the indicators and their relative importance. Because our understanding has been completely systematized, there is no qualitative judgment used in describing these estimates. In fact, the texts have been computer generated.
- In Part 3, "The Rises and Declines of Economies Over the Last 500 Years", we will look at how different countries' shares of the world economy have changed over the last 500 years and why these changes have occurred.

# Part 1: The Formula for Economic Success

What determines which countries prosper and which countries don't? What determines different countries' future growth rates? For our investment purposes we look at relationships between causes and effects that we hope will be useful to others in answering these questions.

While many people have provided opinions about why countries succeed and fail economically, they have not shown linkages between causes and effects. As a result, their opinions can be misleading. Often, even commonly agreed-upon indicators of what is good for an economy have not been properly analyzed and correlated with subsequent results. For example, everyone knows that having a more educated population is better than having a less educated population, so naturally we hear that improving education is important to improving productivity. However, indicators of the cost-effectiveness of education are lacking and correlations of the factors with subsequent growth don't exist, at least to my knowledge. That is dangerous. For example, if policy makers simply educate people without considering the costs and paybacks of that education, they will waste resources and make their economies less productive even though we will become more educated people. To make matters worse, the views of those who influence policies typically reflect their ideological inclinations (e.g., being politically left or right) which divides people. For this reason, I believe that objective good indicators that are correlated with subsequent results are needed so that the facts speak for themselves and help people reach agreement about what should be done. That is what I believe I provide here. The economic health indicators that I will show would have predicted the subsequent 10-year real growth of the 20 countries shown over the last 65 years within 2% of the realized growth about 80% of the time and within 1% half of the time, with the average miss around 1%.

While I believe that the body of evidence I will show you is compelling, I certainly don't claim to have all the answers or expect people to blindly follow what is presented here without poking at it. On the contrary. I am putting these cause-effect relationships on the table to help foster the debate to bring about progress. I hope that people of divergent views will explore and debate how the economic machine works by looking at both the logic and the evidence presented here, then see what it portends for the future, and then explore what can be done to make the future better. Having said that, we are confident enough in these estimates to bet on their accuracy, which we do in our investments.

## The Determinants of Economic Health Are Timeless and Universal

As with human bodies, I believe that the economies of different countries have worked in essentially the same ways for as far back as you can see so that the most important cause-effect relationships are timeless and universal. In this section I review these cause-effect relationships and look at many countries in different timeframes to show how they worked. I will lay these out for you to consider. I don't believe that it's good enough to just show the correlations between changes in these factors and their outcomes. I believe that it's necessary to be so clear on the fundamental cause-effect relationships that it seems obvious that they must be so; otherwise you can't be confident that a relationship is timeless and that you aren't missing something. I will first present the concepts and then take you into the indicators to show how they worked in the past and what they portend for the future.

## What are the Keys to Success?

**I Will Start With a Top-Down Perspective:** As with health, many factors (reflected in many statistics) produce good and bad outcomes. You can approach them by looking down on the forest or building up from the trees. In presenting them I wrestled with whether to start at the top and work our way down through all the pieces or start with all the pieces and work ourselves up to the big picture. I chose to approach this from the top down as that's the perspective that I'm more comfortable with. I prefer to simplify and then flesh out the picture. Receiving

information presented this way will require you to be patient with the sweeping generalizations I make until I get down to the particulars that make them up, which will show both the norms and the exceptions.

**Productivity Influences on Growth Are Intertwined With Debt Influences:** While my objective is to look at productivity in this section, in doing so I wanted to tie that into looking at the drivers of growth over the next 10 years, which is affected by debt as well as the drivers of productivity. In other words, productivity influences on growth and debt influences on growth are unavoidably entangled. As explained in "How the Economic Machine Works," while productivity growth is ultimately what matters for long-term prosperity, and the effects of debt cycles cancel out over time, the swings around that productivity long-term trend arising from debt cycles cancel out over such long amounts of time (upwards of 100 years because of long-term debt cycles) that it is impossible to look at growth periods without debt cycles playing a role in driving the outcomes. Of course, when one lengthens the observed timeframe, the shorter-term volatility that is due to debt swings diminishes in importance. We chose to look at rolling 10-year periods of 20 countries which gave us a sample size of 159 observations (where we measure every 5 years).

**The Big Picture:** Stepping away from the wiggles of any given day, and looking from the top down, one can see that the big shifts in economic growth are about two-thirds driven by productivity and one-third driven by indebtedness. "Luck" (e.g., having a lot of resources when the resources are valuable) and "conflict" (especially wars) are also drivers.

## Productivity

A country's production (GDP) will equal its number of workers times the output per worker (productivity). One can increase one's productivity either by working harder or by working smarter. Productivity is driven by how cost-effectively one can produce, so relative productivity—i.e., competitiveness—will have a big effect on relative growth. In a global economy those producers who are more competitive will both 1) sell more in their own country and other countries, and 2) move their production to countries where they can produce more cost-effectively. Likewise, investors will follow these opportunities.

Competitiveness (i.e., relative productivity levels) is driven by what you get relative to what you pay in one country versus another. Countries are just the aggregates of the people and the companies that make them up. As you know with the individuals you hire and from the products you buy, those that offer the most value for money are the most competitive and do better than those that don't.

**Specific Indicators:** Since people are the largest cost of production, it follows that those countries that offer the best "value" (i.e., the most productive workers per dollar of cost) will, all else being equal, experience the most demand for their people. That is why the per-hour-worked cost differences of educated people (i.e., their income after adjusting for hours worked each year) is one of the best indicators of productivity. Other obvious and important factors that influence productivity include cost of uneducated people, levels of bureaucracy, attitudes about work, raw material costs, lending and capital market efficiencies—i.e., everything that affects the value of what is produced relative to the cost of making it. In other words, there is a world market for productive resources that increases the demand, and hence the growth rates, for the countries that are most competitive because of "the cost of production arbitrage." That cost of production arbitrage has been a big driver of growth—in fact overwhelmingly the largest. To reiterate, the magnitude of this competitiveness arbitrage is driven more by the cost of the workers relative to how hard they work, their education, and investment levels, than by anything else. These variables characterize the value of hiring a worker in a given country and doing business there (i.e., what you pay for what you get).

Of course, barriers to the flow of trade and capital (like China's closed door policies until the early 1980s, geographic isolation, etc.) can stand in the way of people, companies and countries being allowed to compete. As these barriers break down (e.g., transportation becomes cheaper and quicker, telecommunications reduce

impediments to intellectual competition, etc.) or increase (e.g., trade barriers are put up), the ability to arbitrage the costs of production, and in turn the relative growth rates, is affected.

**While countries that operate efficiently will grow at faster paces than countries that operate inefficiently, the countries that will grow the fastest are those that have big inefficiencies that are disposed of.** As an example, in the 1970s and 1980s, China had a well-educated, intelligent labor force that could work for cheap, but faced a closed door policy. Opening the door unleashed China's great potential. Looking forward, while the United States is relatively efficient, it would not grow as fast as a Russia (i.e., which has competitively priced educated people with low debt) if Russia could significantly reduce its barriers to productivity (e.g., corruption, lack of development of its debt/capital markets, lack of investment, lack of innovation, bad work attitudes, lack of adequate private property laws, etc.). That is why I am most optimistic about inefficient countries that are undertaking the sort of reforms that are described in this section.

**Culture is one of the biggest drivers of productivity.** It's intuitive that what a country's people value and how they operate together matters for a country's competitive position. Culture influences the decisions people make about factors such as savings rates or how many hours they work each week. Culture can also help explain why a country can appear to have the right ingredients for growth but consistently underperform, or vice versa. For example, in Russia, which has a lot of untapped potential, the culture that affects lifestyles (e.g., alcoholism, the low drive to succeed, etc.) causes it to substantially under-live its potential, while in Singapore, where high income levels make their labor relatively uncompetitive, their lifestyles and values (e.g., around working, saving and investing) allow them to realize a higher percentage of their potential. While lots of elements of culture can matter, the ones that I find matter most are: 1) the extent to which individuals enjoy the rewards and suffer the penalties of their productivity (i.e., the degrees of their self-sufficiency), 2) how much the people value savoring life versus achieving, 3) the extent to which innovation and commercialism are valued, 4) the degree of bureaucracy, 5) the extent of corruption and 6) the extent to which there is rule of law. Basically, countries that have people who earn their keep, strive to achieve and innovate, and facilitate an efficient market-based economy will grow faster than countries that prioritize savoring life, undermine market forces through highly redistributive systems, and have inefficient institutions. To be clear, I am not making any value judgments. It would be illogical for me to say that people who savor non-work activities are making a mistake relative to people who love working. It is however not illogical for me to say that people who savor non-work activities are likely to be less productive than those who love working.

## Indebtedness

At the risk of repeating myself too many times, I will review the way I look at debt cycles because I carry that perspective into my calculations in explaining 10-year growth rates.

As explained, short-term volatility is more due to debt cycles than productivity, but this volatility cancels out over time because credit allows people to consume more than they produce when they acquire it, and it forces people to consume less than they produce when they pay it back. Undulations around long-term productivity are driven by debt cycles. Remember, in an economy without credit, the only way to increase your spending is to produce more, but in an economy with credit, you can also increase your spending by borrowing. That creates cycles. When debt levels are low relative to income levels and are rising, the upward cycle is self-reinforcing on the upside because rising spending generates rising incomes and rising net worths, which raise borrowers' capacity to borrow, which allows more buying and spending, etc. However, since debts can't rise faster than money and income forever, there are limits to debt growth.

Think of debt growth that is faster than income growth as being like air in a scuba bottle—there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. In the case of debt, you can take it out before you put it in (i.e., if you don't have any debt, you can take it out), but you are expected to return what you took out. When you are taking it out, you can spend more than is sustainable, which will give you the appearance of being prosperous. At such times, you and those who are lending to you might mistake you as

being creditworthy and not pay enough attention to what paying back will look like. When debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse.

You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt. For these reasons **I expect countries that have a) low amounts of debt relative to incomes, b) debt growth rates that are low in relation to income growth rates and c) easier monetary policies to grow faster over the next ten years than countries with d) high amounts of debt relative to incomes, e) debt growth rates that are high in relation to income growth rates and f) tighter monetary policies.** That is true with one exception, which is when adequate financial intermediaries don't exist. Institutions and capital markets that facilitate these transactions have to be in place for the system to work. For that reason, when forecasting long-term future growth rates we have taken into consideration the levels of development of countries' financial intermediaries.

**Luck and Wars:** As mentioned, they can play a role. For example, the US having shale gas was lucky. Potential conflicts should always be watched. While to some extent these can be anticipated, they are not part of our formula and they don't typically matter much—i.e., they are exceptional.

## The Interaction of These Forces is Driven By Human Nature

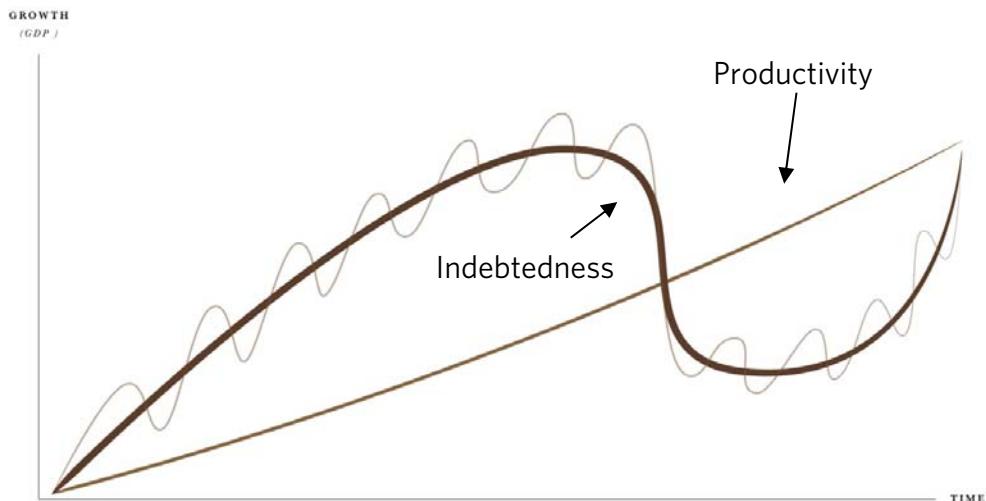
While productivity and indebtedness can be thought of as separate concepts, they are ultimately a function of the choices people make and their psychology. I briefly touched on culture as an influence on these choices and their outcomes. Also, I observe important shifts in attitudes from one generation to the next which are due to their different experiences. In Part 3, "The Rises and Declines of Economies Over the Last 500 Years," I show how psychology tends to shift as countries move through their economic life cycles. It is worth touching on this influence here before I delve into an examination of what all the economic health indicators are pointing to for the 20 major economies.

In addition to productivity and the debt cycles I spoke about, there tends to be a psychologically motivated cycle that occurs as a function of one's past level of prosperity and whether one experienced improving or worsening economic conditions. When a country is poor and focused on survival, its people who have subsistence lifestyles don't waste money because they value it a lot and they don't have any debt to speak of because savings are short and nobody wants to lend to them. Even though the country's labor is low-cost, it is not competitive, and the lack of investment stymies future productivity gains. Some emerge from this stage and others don't, with culture and location being two of the biggest determinants. For those that do—either because a country removes a big barrier like being closed to the world (as China did in 1980) or simply because a more gradual evolution makes their labor attractive—a virtuous cycle can kick in. At this stage, the investments are not just inexpensive; the stock of infrastructure and other physical capital is also typically low and there is lots of room to adopt existing technologies that can radically improve the country's potential. Leveraging up (increasing one's indebtedness) can feed back into higher productivity and competitiveness gains, which produce high returns that attract more investment at a time when the capacity to leverage is high. The key is that this money and credit must be used to produce investments that yield enough returns to pay for the debt service and finance further growth (so that incomes rise as fast as or faster than debts). Yet as countries grow wealthier, more and more of the credit tends to fuel consumption rather than investment. A process that was once virtuous can become self-destructive. The decreased investment in quality projects means productivity growth slows, even as the borrowing and spending makes incomes grow and labor more expensive. People feel rich and begin taking more leisure—after all, asset prices are high—even though their balance sheets are starting to deteriorate. At this point, debt burdens start to compound and incomes grow faster than productivity growth. In other words, the country tends to become over-indebted and uncompetitive. The country is becoming poor even though it is still behaving as though it is rich. Eventually the excess tends to lead to bubbles bursting, a period of slow decline and deleveraging. Suffice it to say that when looking at a country's potential to grow, it is critical to look at the country's productivity and indebtedness holistically, as part of its stage of development.

## A Formula for Future Growth

As explained, my research team and I built the formula for future growth from the top down. We started with my concepts of how productivity and indebtedness affect growth, then fleshed these forces out with specific indicators, and then saw how the formula created this way worked. I followed this approach because I believe that one should be able to describe the cause-effect relationships and the logic behind them without looking at the data and that only after doing that should one look at the data to see how well the descriptions square with what happened because otherwise one would be inclined to be blinded by data and not force oneself to objectively test one's understanding of the cause-effect relationships.

As mentioned, from what I can tell, about two-thirds of a country's 10-year growth rates will be due to productivity and about one-third will be due to indebtedness. The visual below conveys these two forces. Our productivity indicators aim to measure how steep the productivity growth line will be over time, and our indebtedness measures aim to measure how debt cycles will influence growth over the medium term.



Below is a list of what I have come to learn about these things along with the names of the indices my research team and I created to reflect them. Based on the reasons outlined there, we created 1) a simple logic-weighted index of productivity and 2) a simple logic-weighted index of indebtedness. We used the same set of factors weighed the same way for each gauge across all the countries and across all timeframes. That way there was no fitting the data and our measures for productivity and indebtedness are timeless and universal. We put two-thirds of the weight on productivity and a third on indebtedness.<sup>380</sup> After creating these indices, we observed how each predicted the subsequent 10 years' growth rates for each country (which we measure every 5 years). In other words, we observed rather than fit the data. The table below shows the concepts, their weights, and their correlations with the next 10 years' per capita growth rates for our universe of 20 countries. Together these indicators were 84% correlated with the countries' subsequent growth rates. Below we show how well these measures related to future growth across countries and time.<sup>381</sup>

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<sup>380</sup> As mentioned, our gauges of productivity and indebtedness are constructed using simple logic-based weights. Within productivity, we put two-thirds weight on what you pay versus what you get and one-third on culture. Within each of these gauges we put equal weight on the different sub-pieces. Within our indebtedness gauge, we put half the weight on debt cycle dynamics and half on monetary policy.

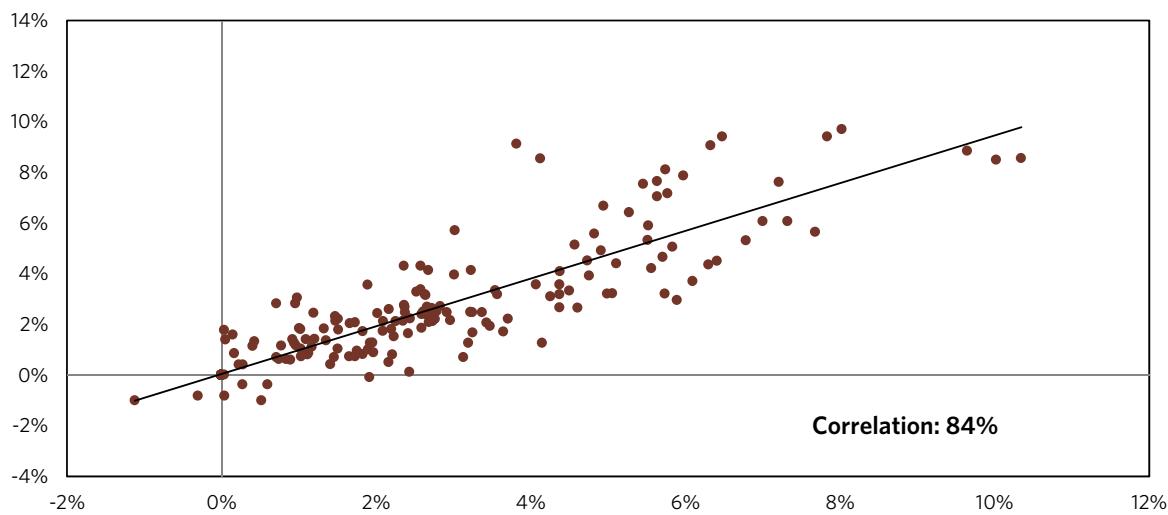
<sup>381</sup> My approach to research is to first think through what makes sense to me and to look at the data to stress test my thinking. This is a very different approach compared to optimization methods (or data mining) which typically go to the data first, and fish for relationships and conclusions. Because I was asked how much better the results would be if we let the computer fit the equations, we ran the data fitting exercise and observed that if we do that, the correlations with future growth don't change much (they range from 80% to 85% correlated with future growth results depending on the process used).

| Future Growth Estimate - A Summary of Our Reasons  |   |        |             |  |
|--|---|--------|-------------|--|
| Concept  | Gauge   | Weight | Correlation |  |
| <b>Aggregate Estimate</b>  | -   | 100%   | 84%         |  |
| <b>Productivity:</b> Producing more by working harder or smarter.  | -   | 65%    | 64%         |  |
| <b>i. Value: What You Pay vs. What You Get:</b><br>Countries that offer the most value for money do better than those that don't. The most important attributes are whether its people work hard, invest, are educated and productive in their jobs. | -   | 45%    | 63%         |  |
| <b>ii. Education:</b> A better educated worker will likely be more effective today and offers more promise for tomorrow than his/her peer.   | Cost of a Quality Adjusted Educated Worker          | 11%    | 66%         |  |
| <b>iii. Labor Productivity:</b> A worker of similar education who produces more in the same amount of time is more attractive than than the one producing less.  | Cost of a Productivity Adjusted Educated Worker     | 11%    | 49%         |  |
| <b>iv. Working Hard:</b> Hard workers will generally produce more and find ways to improve faster than those who opt more for leisure.   | Working Hard Relative to Income (2 pieces)          | 11%    | 66%         |  |
| <b>v. Investing:</b> Countries that save and invest in productive capital and infrastructure will improve their potential more than those that don't.  | Investing Rel. Inc. (2 pcs)                         | 11%    | 59%         |  |
| <b>II. Culture:</b><br>Culture influences the choices people make and the effectiveness of an economic system.   | -   | 20%    | 58%         |  |
| <b>i. Self-Sufficiency:</b> The need and the ability to independently support oneself is healthy and important to being successful.  | Self-Sufficiency Ex. Inc. Effect (3 pcs, 9 sub-pcs) | 3%     | 42%         |  |
| <b>ii. Savoring Life vs. Achieving:</b> Those who value achievement over savoring the fruits of life will be more successful in finding ways to work harder and smarter.   | Savoring v. Achieving Ex. Inc. (2 pcs, 8 sub-pcs)   | 3%     | 40%         |  |
| <b>iii. Innovation &amp; Commercialism:</b> Countries that value new ideas and invest in them will find new better ways to produce faster.   | Innovation & Commerc. Ex. Inc. (2 pcs, 10 sub-pcs)  | 3%     | 49%         |  |
| <b>iv. Bureaucracy:</b> Lots of red tape and regulations stymies business activity.  | Bureaucracy Ex. Inc. (3 sub-pcs)                    | 3%     | 32%         |  |
| <b>v. Corruption:</b> Corruption deters investment and distorts market incentives.   | Corruption Ex. Inc. (4 sub-pcs)                     | 3%     | 58%         |  |
| <b>vi. Rule of Law:</b> Investors and business people need to feel secure their agreements and property will be protected.   | Rule of Law Ex. Inc. (4 sub-pcs)                    | 3%     | 57%         |  |
| <b>Indebtedness:</b> Swings in credit drive swings in spending and economic growth.  | -   | 35%    | 44%         |  |
| <b>I. Debt and Debt Service Levels:</b><br>Countries with high debt burdens have less room to leverage and take on new debt.   | Debt and Debt Service Levels                        | 12%    | 26%         |  |
| <b>II. Debt Flow:</b><br>A country can rely on credit growth to boost spending above incomes, but only for so long. When that rate of credit cannot be sustained, spending must slow.  | Debt Flow   | 6%     | -18%        |  |
| <b>III. Monetary Policy:</b><br>Monetary policy can make new borrowing more or less attractive.  | Monetary Policy                                     | 18%    | 30%         |  |

These measures of productivity and indebtedness can be used to predict each country's absolute and relative growth rates over the next ten years, or longer periods. They also can be used by policy makers to indicate what levers they can move to influence future growth. To reiterate, my goal is to get the big picture right—i.e., to reliably be approximately right by focusing on the most important drivers rather than to try to be precise by focusing on the details.

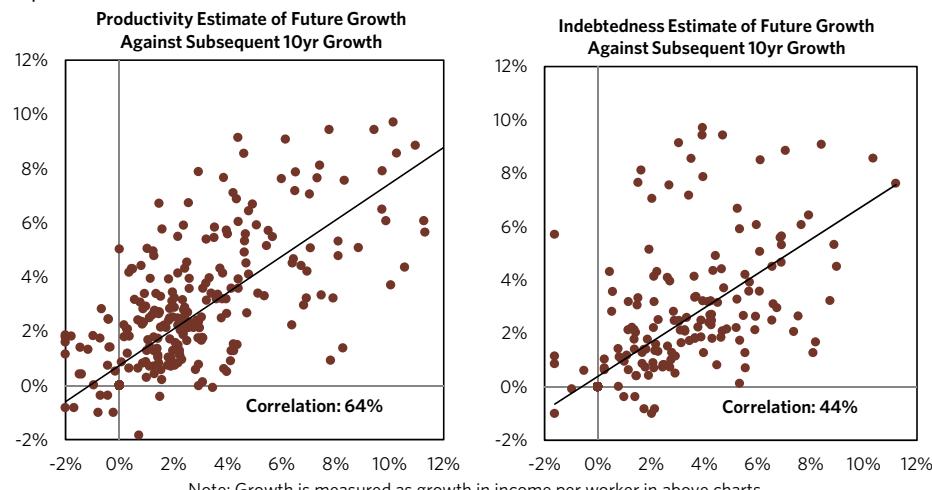
Before looking at the picture we will show you how our aggregate indicator would have predicted growth versus what actually occurred. While staring at the observations helps us ground ourselves in reality and test our logic, we know there is no precision in the specific numbers and what matters most to us is whether our logic is strong. Our examination covers 159 separate observations across 20 different countries over the last 65 years, which provides a wide range of different environments to test our indicator. Along with the correlation of our predictions and what growth actually materialized (shown below), another test is how reliably we predicted something reasonably close to what happened. In our set, our aggregate predictions for a country's average growth over the next decade were within 1% of the actual about half of the time, and within 2% around 80% of the time.

### Aggregate Estimate of Future Growth (x-axis) Against Subsequent 10yr Growth

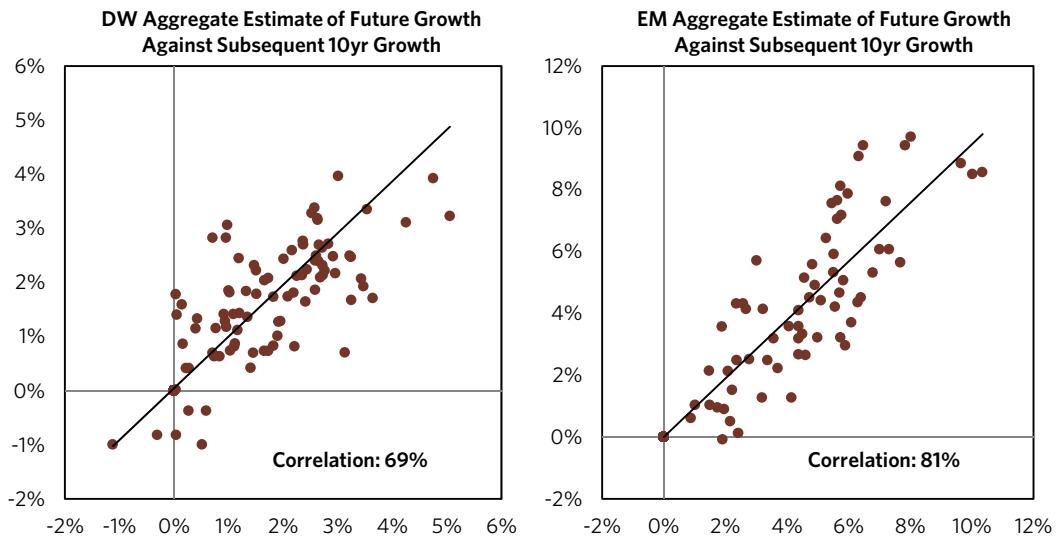


Note: For periods where we have productivity and indebtedness, 159 datapoints over 20 countries.

Below we show the same perspective for each of our productivity and indebtedness gauges, comparing what they implied individually for a country's growth versus what happened. As you can see our measure of productivity is more strongly correlated with each country's growth than our indebtedness measure is (64% vs. 44%), which makes sense given it is the more important driver over the timeframes tested. Still, each has a fairly good relationship on its own.



Because these are timeless and universal drivers, we expect them to be just as important in developed countries as they are in emerging ones. The type of investment or education that matters may shift, but ultimately whether a country sees productivity growth is still going to be largely a function of the basic building blocks of productivity—whether its workers offer value, whether it is investing in its culture and creating a culture of success—as well as how its indebtedness is evolving. Across the countries we have examined, our aggregate indicator is about as correlated with future growth for developed and emerging countries (69% correlated with the growth in income per worker in developed countries and 81% correlated in emerging countries). Of course, which countries are “developed” or “emerging” changes over very long periods as discussed in “The Rises and Declines of Economies Over the Last 500 Years.” So in the tests shown below, we adjust for that, for example excluding Japan in the 1960s when it was much more like an emerging country.



To reiterate, I believe getting to this fundamental level is critical to understanding and predicting the growth of countries. Naïve measures of a country’s future growth, for example just income on its own or a country’s trailing growth, won’t get you much because they won’t help you get at the drivers. They also tend to be much worse predictors than the formula I have described here (about 25% as good by traditional statistical measures). Looking at the economy as a machine and granularly measuring the cause-effect relationships makes all the difference.

## Projections

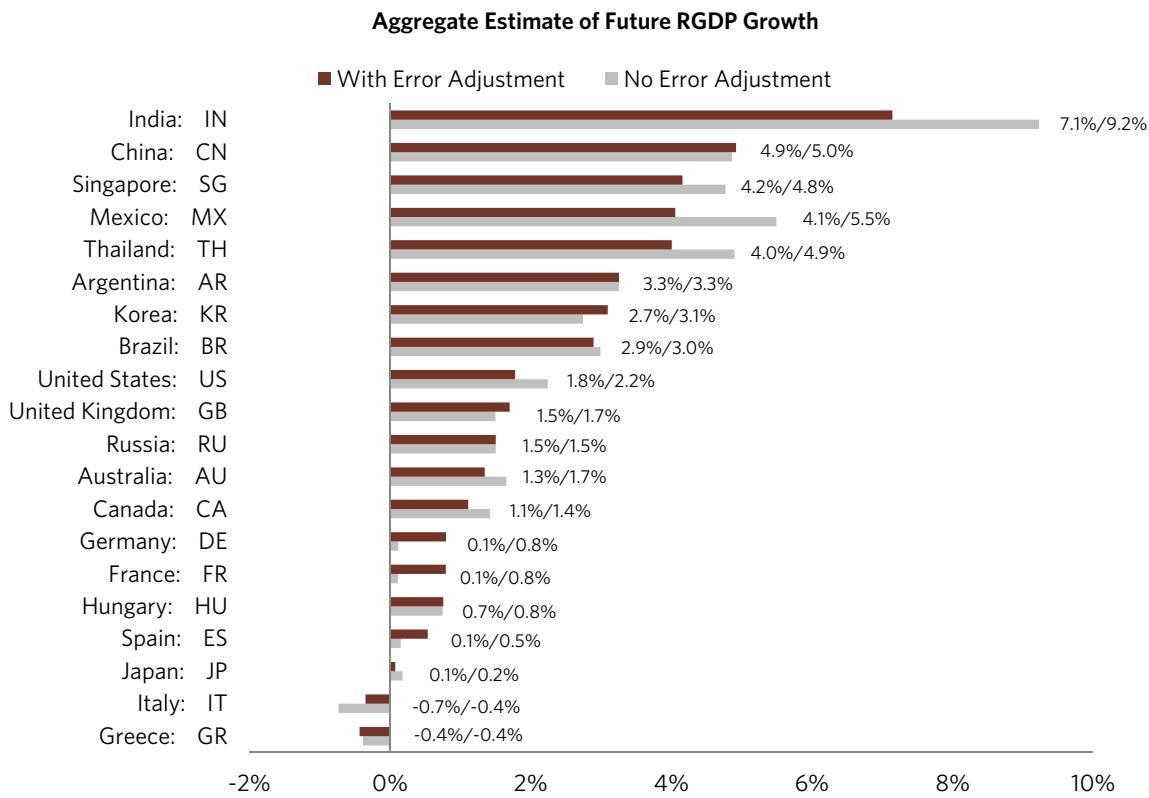
I will start with our projections and then explain how they were derived.

As discussed, by looking at the elements that drive productivity and indebtedness you can arrive at a view of how fast a country will grow its output per worker. Since economic growth is mechanically just a function of growth in its a) output per worker and b) number of workers, it's then a simple step for us to estimate economic growth. In the following section we quickly scan what our projections show. We will then go into depth on the reasons behind them.

The chart below shows our estimate in aggregate for real GDP growth in these major countries. We provide two estimates: one that is based on the exact same formula for all countries and one that is that estimate corrected for the average past error. This additional step notes whether we were systematically over-optimistic or pessimistic in our predictions for a given country, and adjusted for that, to account for the fact that we may be missing a factor specific to that country.<sup>382</sup> We simply found how much the universal formula was off in the past on average (e.g., 1%) and assumed that it would be off by that amount over the next ten years. That adjustment is meant to account for unexplained factors. These two estimates typically don't yield meaningful differences and typically don't affect the order of the countries' rankings. We don't know which one is better so we look at both. Overall, we expect India to grow fastest, followed by China, Singapore and Mexico. Our expectation is for the US and the UK to be among the fastest-growing developed nations and for Japan and southern European countries to be the slowest growing in the world.

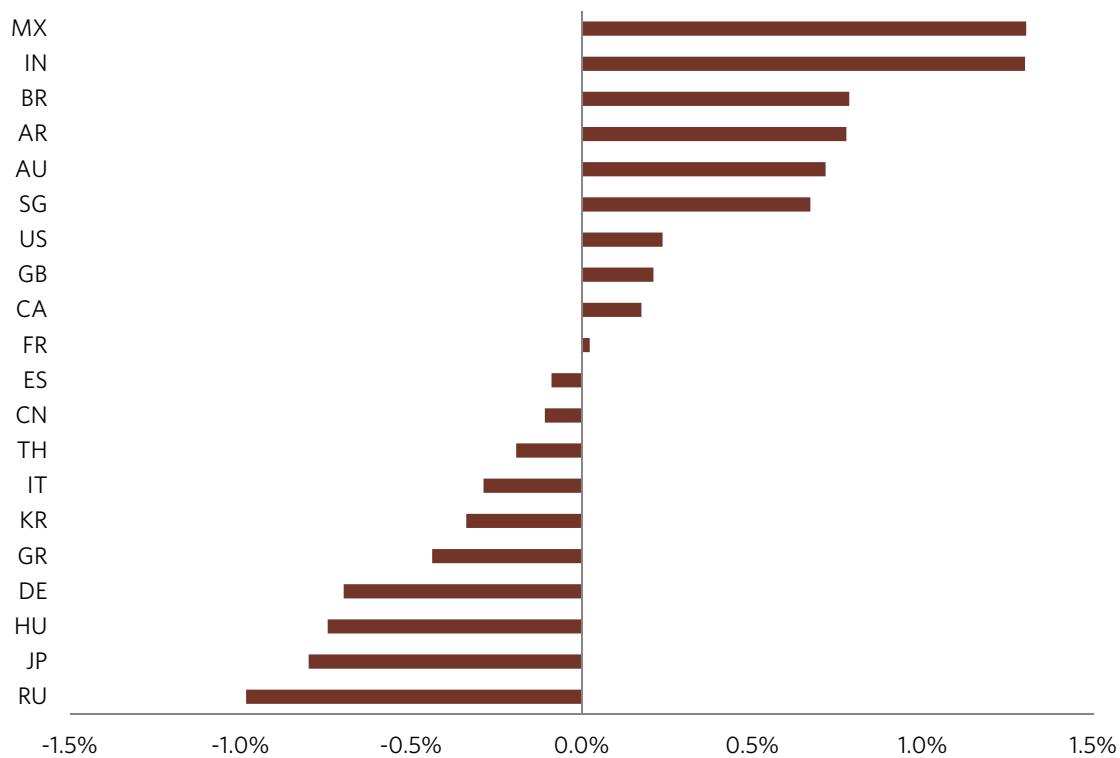
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<sup>382</sup> Note: In sectioning our misses, we realized that sometimes for a given country we were systematically over-optimistic about its growth or pessimistic. Overall these biases are pretty small but they also raise the question of whether we are missing a specific factor that is particularly important for that country (we know we can't capture everything). The correlation shown above of 84% includes our adjustment for these country-specific misses (for lack of a better term our 'error adjustment'). It's not a big deal—if we don't make this adjustment the correlation is 77% (i.e., a 77% correlation between our prediction for a country's growth in income per worker over the next decade and the growth in income per worker that materialized, across our sample of 20 countries and 159 datapoints). This allows us to show a type of range in our estimates for countries, which highlights what we have gotten wrong in the past and its magnitude.

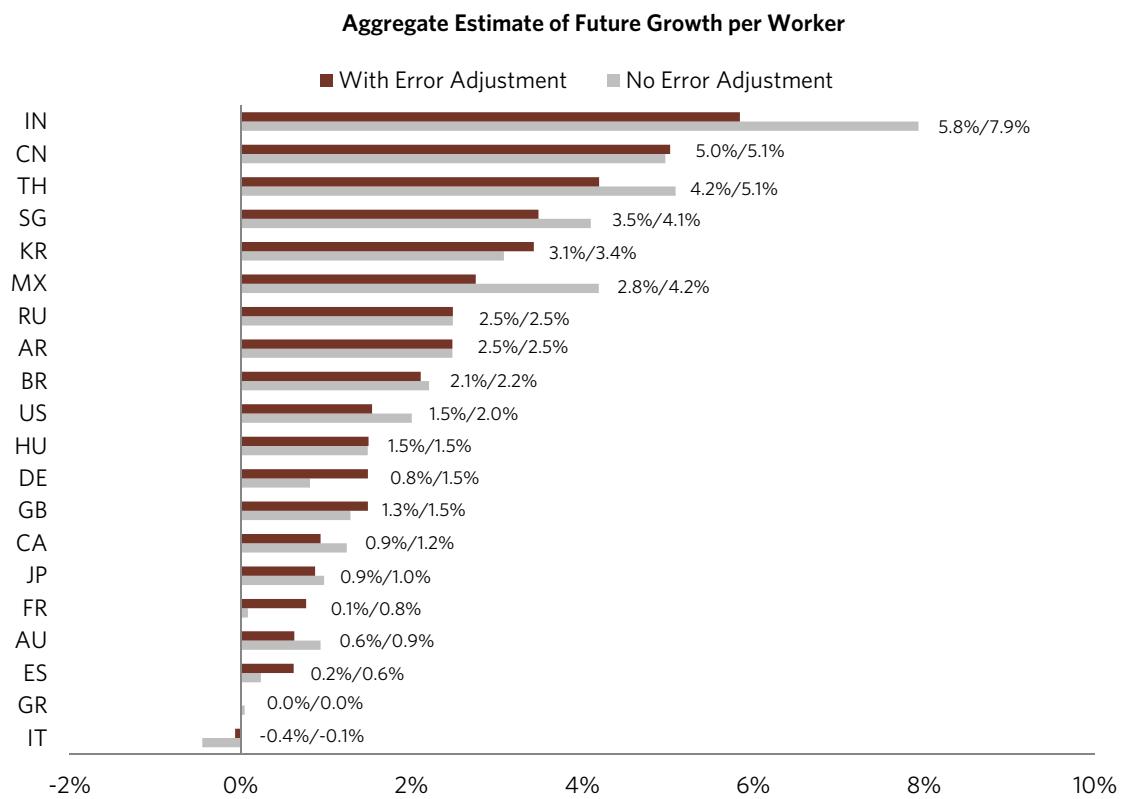


Because GDP is just output per worker times the number of workers, that estimate includes two major pieces: demographic trends (or more specifically the expected change in workers), and an estimate of future growth per worker. We show the chart of the expected change in workers first, below. On this measure, you can see that Europe, Russia and Japan's challenges are compounded by an aging and shrinking workforce, while countries like Mexico and India will enjoy a growth in workers as a support to their potential growth.

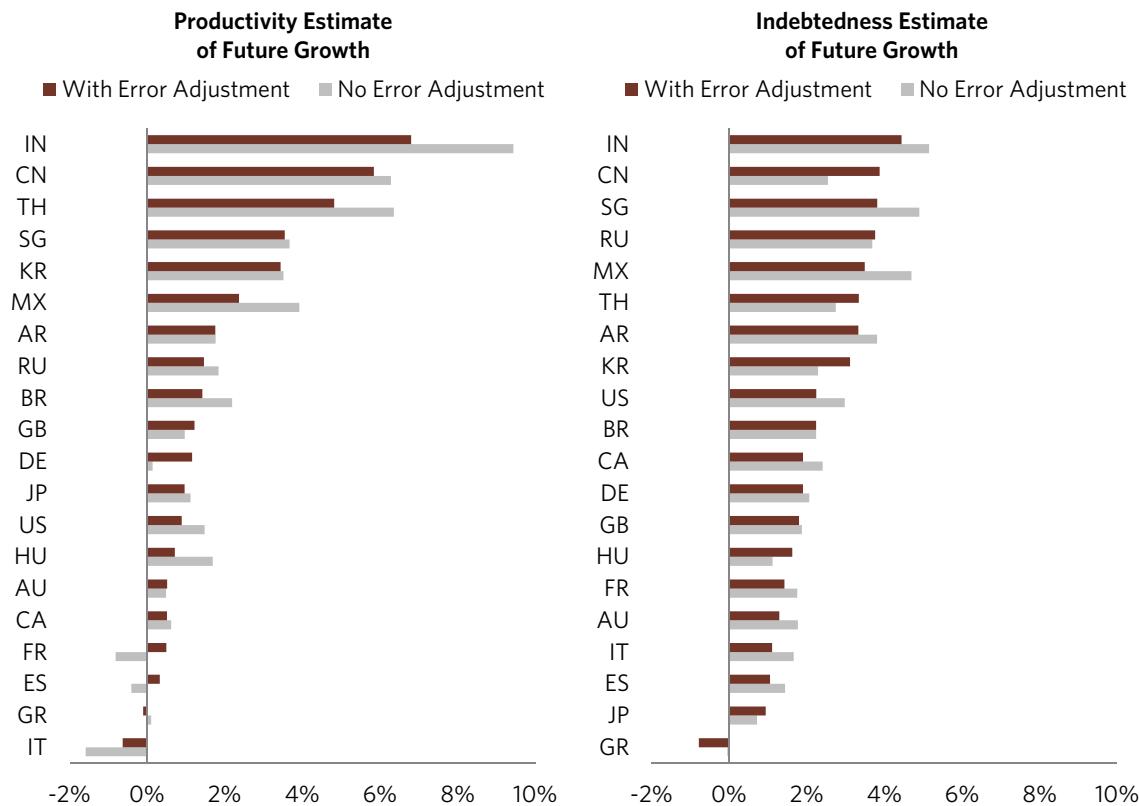
### Ann. Expected Growth in Working Age Population



The next chart gives a picture of what we would project income growth per worker to be over the next 10 years, again highlighting our estimates with and without the error adjustment.



Our future growth per worker estimate includes two major components: a productivity estimate, and an indebtedness estimate. We show both of these estimates below. They highlight the general attractiveness of the labor arbitrage between most emerging countries relative to the developed world. There is also much more room for these countries to leverage up whereas much of the developed world has reached its long-term debt top and is deleveraging, which means there is much more limited room for spending and income growth to come from credit expansion.



Below, we describe in depth our measures of productivity—both what you pay for what you get, and culture.

## Productivity and Competitiveness Measures

Before getting more into our specific measures of productivity/competitiveness I want to start by reviewing our concepts pertaining to it.

**A country's competitiveness is driven by the value of all that it offers relative to the value of what others offer**—most importantly the value of its people relative to their cost. In a global economy, countries that are more productive will not only produce better value products, but they will also attract investment and new businesses, and they will compel the means of production to move. We expect the producers who are more competitive to both 1) sell more in their own country and other countries, and 2) move their production to countries where they can produce more cost-effectively.

As explained, the most important way countries differentiate themselves is through their labor: whether it is more attractive for a company to hire their workers than to hire workers in a different country. This is not just a function of whether the workers are more productive today. It's a function of the attributes that make them more attractive to hire and invest in over the long term. Since ultimately the only way one can become more productive is through working harder or working smarter, it makes intuitive sense to us that education and work ethic are the most important attributes that matter. Those countries that offer these most cost-competitively tend to do the best. A country may also be more attractive because it's a cheap place to build a factory or because the returns of building new capital and technologies are higher. Additionally, countries that save and invest more tend to grow faster by creating new innovations, capital equipment and infrastructure that help improve the productivity of their workforce relative to other countries with more limited investment rates.

These are the most important ingredients for the productivity growth of a country. But that's not all there is to it. Partly, culture drives the decisions people make about factors like savings rates or how many hours they work each week. But culture can also help explain why a country can appear to have the right ingredients for growth but consistently underperform.

**Culture matters a lot.** Ultimately how a country develops is a function of human behavior and the decisions its people make. Many of those decisions are captured in the attributes that go into a country's relative productivity (like how much people save or how hard they work). But you can learn a lot about the psychology of the different players in the economy and their motivations by staring at different cultural elements. Over very long stretches of time a country's cultural evolution is at the core of its long-term cycles (from being poor and believing it's poor to becoming rich). Over any decade, the way we think about culture is that it can help explain why a country can appear to have the right ingredients for growth but consistently underperform or outperform. For us it makes intuitive sense that countries that emphasize individual self-reliance and striving to achieve are more likely to succeed by creating a meritocratic environment where incentives are based largely on market forces. Countries can also outperform if they are more innovative in producing new products and ideas of value and more commercially minded in harvesting them. On the other hand, countries can underperform if they are corrupt or bureaucratic, or if the rule of law is unsound. To be clear, we are not assessing whether one culture is good or bad; our focus is on the cultural elements that are most important for economic prosperity.

## Our Productivity Gauge

For these reasons, when we look at gauging the productivity of a country we create a measure of 1) the relative value it offers and 2) its culture. We weigh the relative value of a country the most since it is the most important determinant.

Our productivity gauge is just based on the logic we have described. It is mostly a function of the relative value of a country's workers (the labor arbitrage aspect): how educated they are relative to their cost and how hard the people work relative to their cost. These measures give us a sense of whether a country's workers have the ingredients to grow their productivity by working harder or smarter. To triangulate the cost of an educated worker we look at two measures, one that adjusts for the quality of education and one that looks at their observed productivity today. Moving beyond a country's human capital, we also look at investment relative to the cost, which gives us a lens into whether a country is investing to grow its productivity in the future and whether the returns are likely to be attractive (i.e., another perspective on the "cost of production arbitrage").

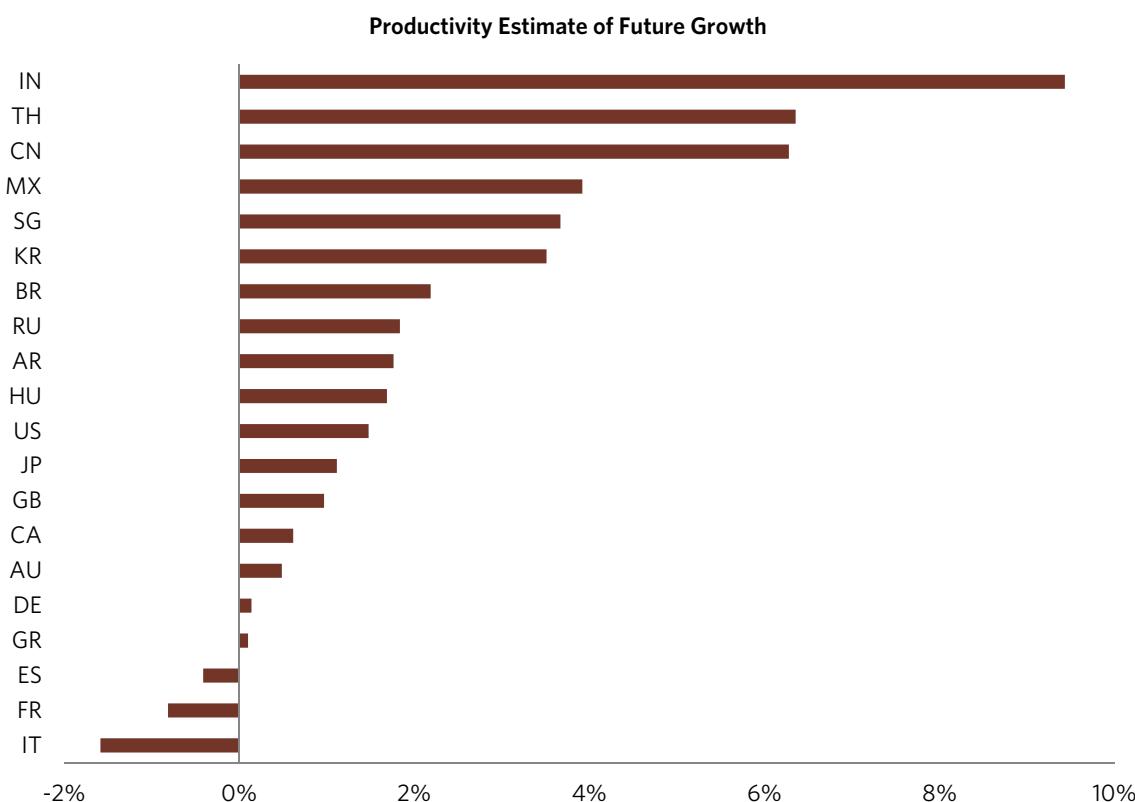
To measure culture, we create a gauge for each of the concepts we have outlined: 1) whether a country values self-sufficiency, 2) whether it values savoring the fruits of life or achieving, 3) whether it is innovative and commercially oriented, 4) its degree of bureaucracy, 5) corruption and 6) rule of law. Self-sufficiency encourages productivity by tying the ability to spend to the need to produce. The concept of savoring life versus achieving captures how much the people in a country are focused on enjoying the things they have versus trying to increase their success and achieve, earn, and create more. Innovation and commercialism capture whether a society is oriented towards seeking profit or generating new insights. The last three get at the basic questions of how difficult it is to get business done in a country—i.e., whether a given country is one where businesses could get off the ground and operate smoothly, where business can be conducted fairly (without corruption) and whether investors and businesses can be confident that contracts and laws will be well enforced.

Together our indicators of productivity were 64% related to countries' subsequent growth rates. To repeat, these estimates were made by applying the exact same factors to all countries in all time periods to determine their subsequent growth.

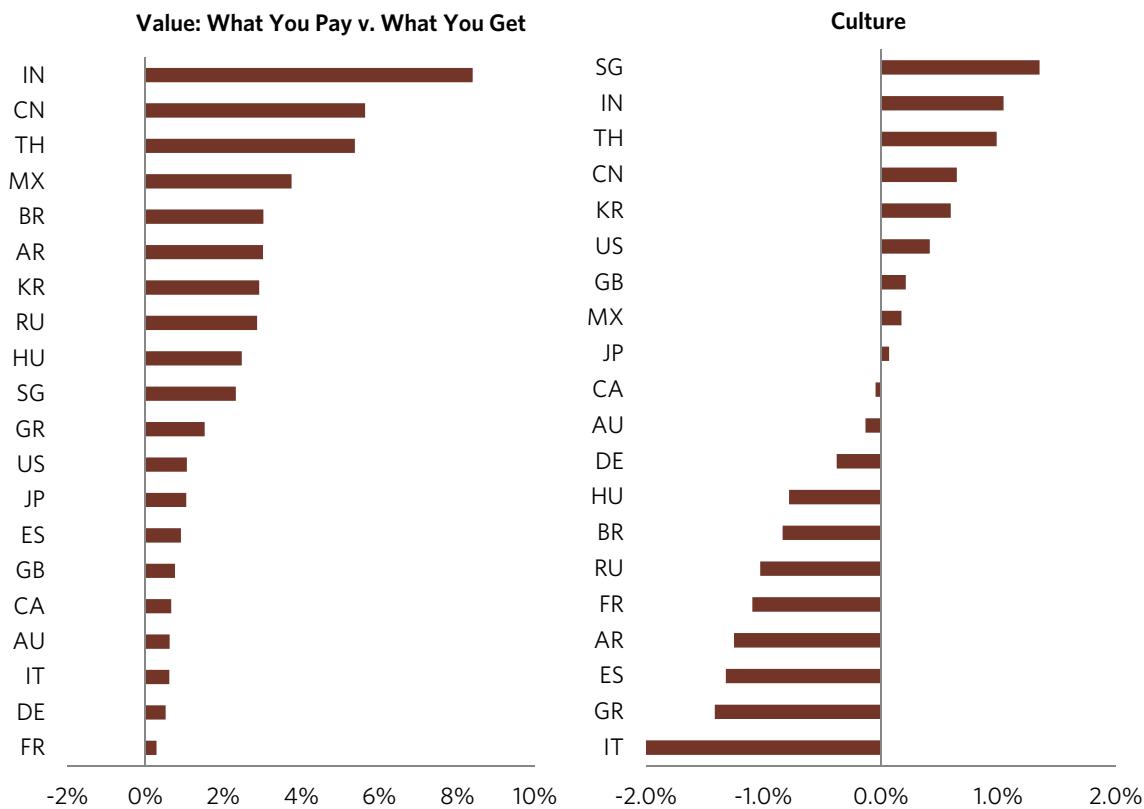
| Productivity  | Correlation | Contribution to Estimate |
|---|-------------|--------------------------|
| <b>Aggregate</b>  | <b>64%</b>  | <b>65%</b>               |
| Value: What You Pay vs. What You Get                              | 63%         | 45%                      |
| Cost of a Quality Adjusted Educated Worker                        | 66%         | 11.3%                    |
| Cost of a Productivity Adjusted Educated Worker                   | 49%         | 11.3%                    |
| Working Hard Relative to Income (2 pieces)                        | 66%         | 11.3%                    |
| Investing Rel. Inc. (2 pieces)                                    | 59%         | 11.3%                    |
| Culture   | 58%         | 20%                      |
| Self-Sufficiency Excluding Income Effect (3 pieces, 9 sub-pieces) | 42%         | 3.3%                     |
| Savoring Life vs. Achieving Ex. Inc. (2 pieces, 8 sub-pieces)     | 40%         | 3.3%                     |
| Innovation & Commercialism Ex. Inc. (2 pieces, 10 sub-pieces)     | 49%         | 3.3%                     |
| Bureaucracy Ex. Inc. (3 pieces)                                   | 32%         | 3.3%                     |
| Corruption Ex. Inc. (4 pieces)                                    | 58%         | 3.3%                     |
| Rule of Law Ex. Inc. (4 pieces)                                   | 57%         | 3.3%                     |

The chart below gives a picture of how we would rate countries today on productivity based on the same logic described above. Our ratings are represented in terms of what a given country's productivity would imply for that country's future growth in income per worker over the next 10 years.

According to our measures, India is best placed to see productivity growth at this point—driven by a very cheap and achievement-oriented labor force, even accounting for poor education, chronic corruption and a generally ineffective system. Together these factors imply India has the ingredients to grow income per worker around 9% annually over the next decade. It also has sizable potential to boost its growth rate if it can reduce its inefficiencies through reforms. China is also highly competitive by our measures, with a growth rate implied by its competitiveness/productivity of about 6% or so. Its workforce is inexpensive and fairly well educated relative to its cost, works hard and provides huge savings for investments. Moreover, as a country that is becoming rich and starting to realize it, China has a huge amount of potential to realize by adopting existing technologies, building out its infrastructure in the underdeveloped parts of the country, and investing in businesses to serve a massive population that is quickly accumulating spending power. Nearly all developed world countries are measured to be relatively uncompetitive, with Italy, France, Spain and Greece uniquely uncompetitive for reasons that will be apparent in the indicators that follow. Most importantly, these countries' labor is expensive, they don't work that hard, and they invest less than most other countries. This is compounded by a social system that prioritizes savoring life over achieving and insulates workers from market forces with rigid labor markets and substantial government safety nets, low levels of innovation and high levels of bureaucracy. It should be noted that we are starting to see some structural reforms to improve productivity and competitiveness, especially in Spain, and that such reforms have the potential of considerably boosting growth because the barriers that reforms would bring down are such drags on growth. Japan is also somewhat uncompetitive but more because its labor is expensive and investment levels stagnant, as opposed to cultural reasons (the work ethic in Japan and level of innovation, for example, remain quite supportive). In such cases, declines in the exchange rate can help. Also, Prime Minister Abe's "three arrow" policies can help a lot if pursued forcefully—more forcefully than currently pursued. The US is the most competitive of the major developed countries we measure. Labor is more competitively priced compared to other developed countries (though expensive compared to many emerging countries), and the culture is supportive, including elements like relative hard work, a drive to achieve and orientation to innovate.



The following two charts give you a summary of where countries stand on our assessment of value (i.e. what you pay for what you get) in each country and whether its culture are a support to or drag on income growth. Overall, the strong value proposition of Asia's workers—especially how hard they work and their level of investment relative to their expense—is supported by cultural attitudes around achievement. In contrast, Europe, once on the frontier of productivity, now invests little and takes more leisure than any other region. And after years of incomes rising faster than underlying productivity, its workers are some of the most expensive in the world and the vibrancy of its labor market is undermined by a system of protections. Japan and Singapore are in the middle of the pack when you look at their high cost of labor and low levels of investment, but we expect them to be helped by cultural factors (e.g., their orientation toward innovation and commercialism and rule of law). In contrast, cultural factors—like corruption, a desire for leisure over achievement—act as a drag for otherwise competitive workforces in Russia and Argentina. We will examine each of the components of these gauges next.<sup>383</sup>



<sup>383</sup> The right chart above shows the adjustment (or “bump”) to the productivity estimate we make based on a country’s culture (e.g., based on our assessment of what you pay for what you get for Singapore’s labor, we would project growth in income per worker of about 2.3%, but we add another 1.3% based on our assessment that Singapore’s culture is very supportive to growth).

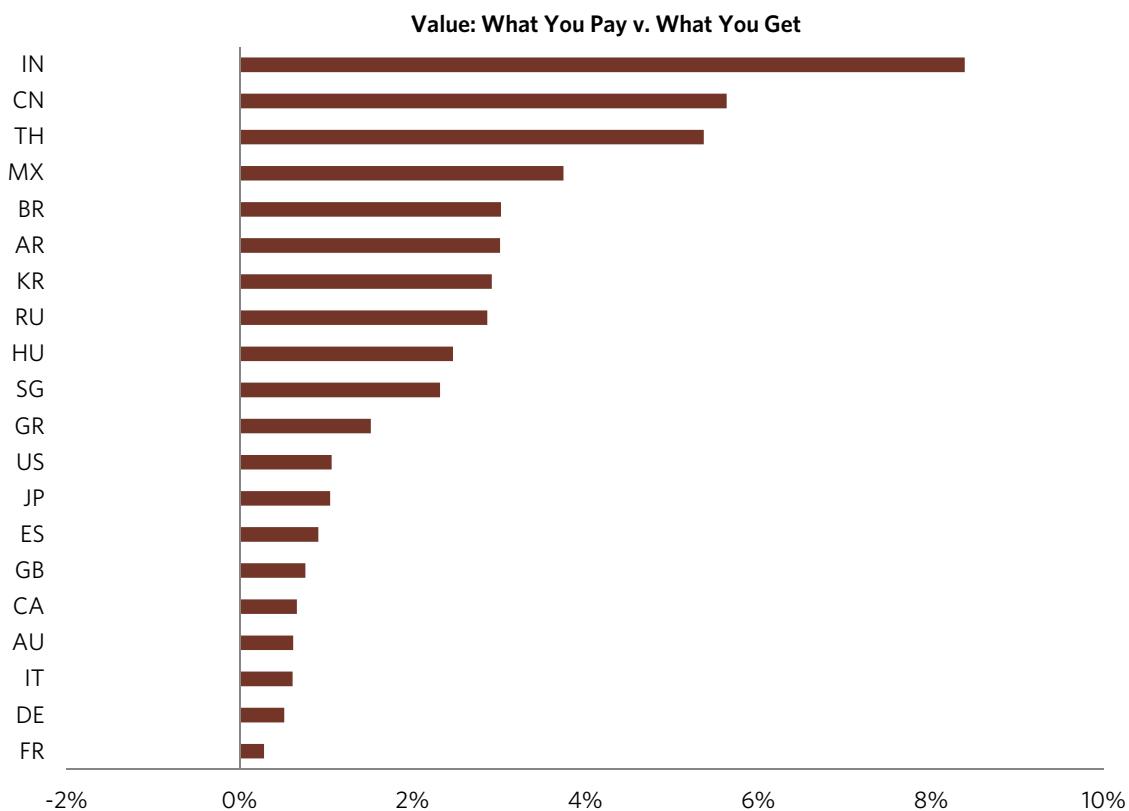
## Value: What You Pay Versus What You Get

As previously discussed, a country's productivity and competitiveness are mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.

To construct this gauge we first looked at the average cost of an educated worker, adjusted for the average hours worked (including the average workweek, vacation time, and holidays) and adjusted for the quality of education (based on international tests). We also created a gauge of the productivity-adjusted cost of labor (a spot picture of how much workers offer relative to what you pay). And we created a gauge of working hard, where we look at the portion of the population working, and then how many hours each of those workers puts in (again adjusting for things like vacation). In addition, this gauge considers demographic shifts that change how much that society is of working age relative to those who are very young or old and dependent. We weighted these equally. This gives us perspective on the cost and value of employees. We also added in a gauge of savings and investment that was also weighted equally. As shown in the correlations, all of these measures were individually highly effective predictors of future growth, as was the aggregate of them. On its own this gauge is 63% correlated to future growth. Most interesting are the individual country rankings by measure, which are shown in the charts that follow. We suggest picking a few countries that you are most interested in and seeing where they stand in these rankings. As we progress through the charts in this section, clear pictures will emerge.

| Value: What You Pay vs. What You Get            | Correlation to Growth | Contribution to Estimate |
|---|-----------------------|--------------------------|
| <b>Aggregate</b>                                | <b>63%</b>            | <b>45%</b>               |
| Cost of a Quality Adjusted Educated Worker      | 66%                   | 11.3%                    |
| Cost of a Productivity Adjusted Educated Worker | 49%                   | 11.3%                    |
| Working Hard Relative to Income (2 pieces)      | 66%                   | 11.3%                    |
| Avg. Hours Worked Rel Inc.                      | 63%                   | 7.5%                     |
| Demographics Rel. Inc.                          | 50%                   | 3.8%                     |
| Investing Rel. Inc. (2 pieces)                  | 59%                   | 11.3%                    |
| Investing %NGDP                                 | 42%                   | 5.6%                     |
| Household Savings                               | 64%                   | 5.6%                     |

India and China rank at the top of our measure of whether a country is cheap or expensive. India's work ethic is very strong, and they're investing a lot in their economy. And while their education scores in absolute terms are not very strong, their income levels are low enough to more than compensate. Before adjusting for cost, China scores better than India along most measures of what a country offers, but Chinese incomes have grown considerably over the last two decades and India's workforce is cheaper. The US scores toward the top of the developed countries thanks to a well-educated workforce that is fairly cheap compared to other developed countries. Spain rates better in the cut below, which doesn't weigh cultural elements like Spanish attitudes toward savoring life versus achieving and self-sufficiency. With labor that is expensive compared to workers of similar education levels elsewhere, Germany and France are at the bottom of the list.



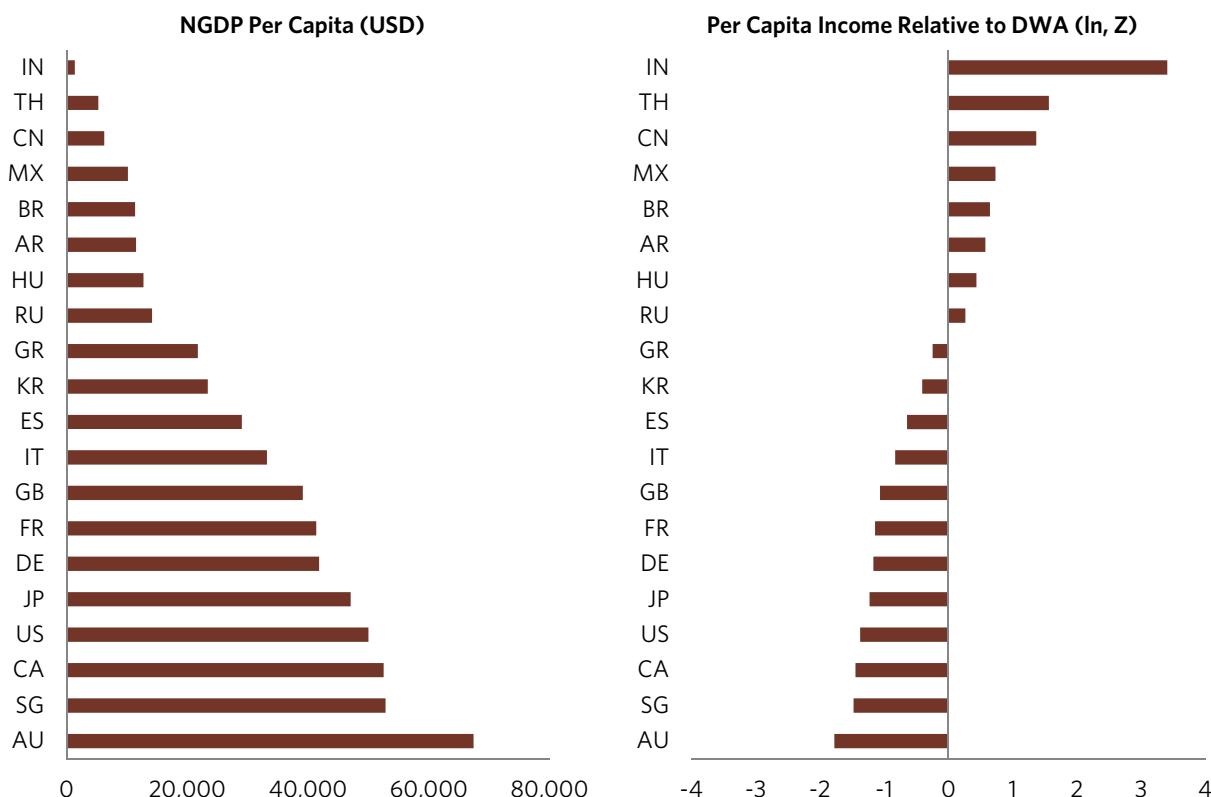
Below we look at the components of our "value: what you pay versus what you get" indicator.

## A Simple Measure of Cost: Per Capita Income

To make any assessment of value we want to look at the attributes of a country relative to their costs. Absent other indications of productivity or indications of what you get for workers, we'd expect relative income levels alone to give you some indication of a country's relative future growth, albeit a naïve one. Through time, countries with cheap workers and low skills can leverage existing technology to increase their productive ability. Similarly, the richest countries generally do not continue to outperform the rest of the world, as their competitive advantages are eaten away by technology transfers to less competitive economies, and the normal behavior of most economies is to increasingly savor the fruits of success by working and investing less.

Our measure of cost simply compares the nominal GDP per capita of a given country relative to the developed world average in log terms, which we believe is more reflective of the impact of differences in income levels. That's based on our intuition that, from a competitiveness perspective, a \$2,000 difference is more meaningful between one country that makes \$500 and one that makes \$2,500 than between countries that make \$40,000 and \$42,000 respectively. Again, this measure of cost is one side of the picture. We combine it with our assessment of various indications of what a country offers to understand its productivity and competitiveness (what it offers relative to its cost).

Today, India is by far the lowest-cost country in our sample. Indian per capita GDP is about \$1500, which is much lower than that of many of the major developing world countries like China, Mexico, Brazil, Russia, or Korea. Even with its significant increase in cost in recent years, China's cost is still one of the lowest in the world. Its per capita income sits at just \$7,000, roughly 70% that of Mexico. However, the differences in cost by area are significant so that growth in China will largely depend on how development will occur in areas, and among people, that are inexpensive. While developed world countries in general have relatively high incomes, it's worth noting some differentiation between those countries—for example, GDP per capita in the poorest European countries like Spain and Greece is only about two-thirds as high as the per capita incomes of the richest developed countries, like the US and Japan. You'll see below that based on how we look at cost, we don't make much of the difference in cost between the developed countries—all are pretty expensive—but we believe there is a big difference between the cheapest emerging countries, like India and China, and the rest (including other countries like Argentina and Brazil).



## Education

### Cost of a Quality Adjusted Educated Worker

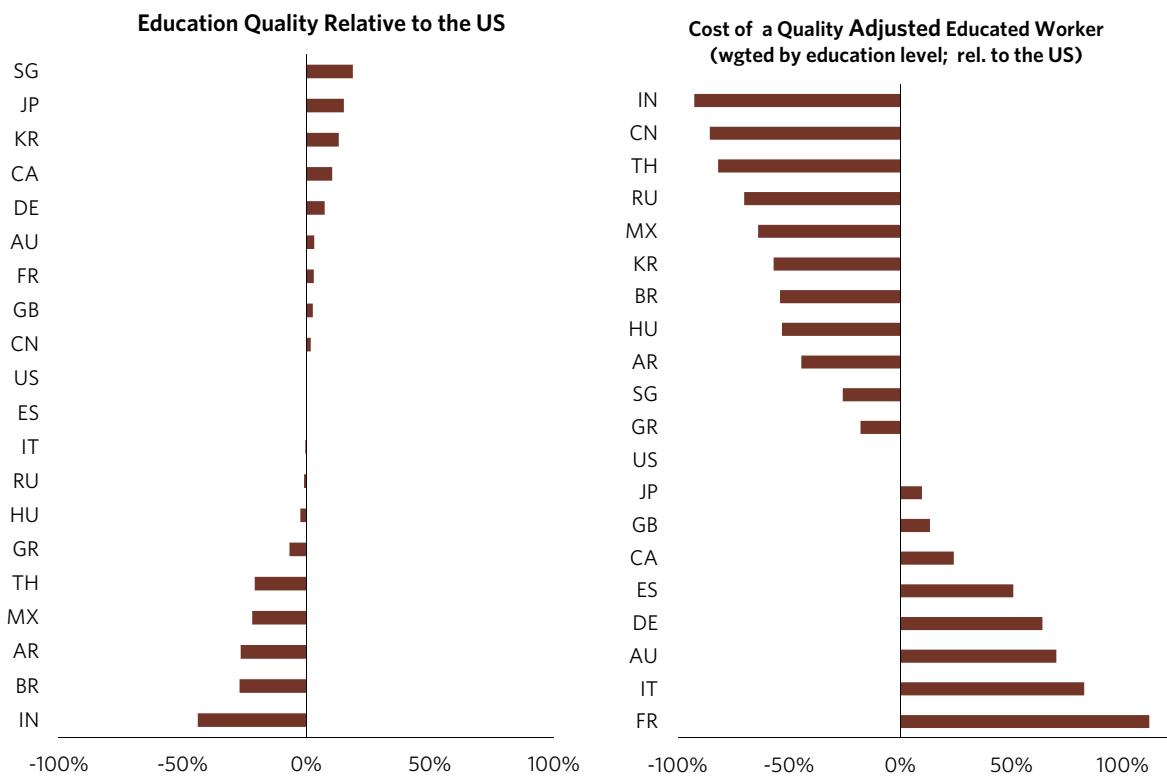
Our single best measure of productivity is the relative cost of a country's educated workforce adjusted for the quality of that education. To construct our measure we look at the relative cost of different cohorts of educated workers (college, high school, those without education), allowing us to get closer to the individuals where the competition occurs. We can then look at the average cost of those workers per hour worked (adjusting for differences like vacation). Further, we take into account the quality of education in one country versus another (e.g., if a high school graduate in the US costs the same as one in France, we also want to ask whether the quality of high school education is the same in both countries). For this adjustment, we use an internationally accepted measure of education quality.<sup>384</sup> That allows us to compare for a given cohort the relative quality of workers' education compared to the relative cost. To come up with an aggregate measure for a country we weight proportionally how much of its population is in each group because if a country's workforce is highly educated, then most of the labor competition happens with other countries at those levels (e.g., between the drug researcher in the US and their peers in Germany). Of course we recognize there is some labor arbitrage across cohorts but this approach lets us capture the dynamic reasonably well.

While there is, if anything, a negative relationship between a country's level of education and its level of future growth (because more expensive countries tend to have more educated people who are more expensive), there is a high correlation between the relative cheapness of a country's educated people and that country's subsequent growth rate. To convey how important it is to consider whether these educated people are expensive or cheap, consider that while there is a -17% correlation between the average level of a country's education and its future growth rate, there is a +66% correlation between cost-adjusted educated level and its future growth rate.

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<sup>384</sup> Our measure of education quality is based on the education quality measures of the OECD's Program for International Student Assessment (PISA). PISA's assessments are designed to test the ability to apply knowledge rather than mastery of a specific curriculum. Our aggregate measure takes into account PISA's measures of education quality across mathematics, science and reading. While we would not put too much weight on the specific placement/ranking of a country, where countries place across the range is indicative. Over 65 countries participated in the most recent PISA section in 2012. The PISA surveys are designed in coordination with participating countries and reviewed to minimize cultural bias. In some cases, as in China, recent assessments have only been conducted in a few cities, which we make an adjustment for.

We show our aggregate measure below on the right, next to our measure of education quality<sup>385</sup> on its own for perspective. Overall, India looks to have the most attractively priced educated population, followed by China, with Russia and Mexico not far behind. Looking across education levels, workers in India with similar levels of education cost a fraction as much as their peers in the US (around 1/20<sup>th</sup>). When we adjust for the quality of education in India being about 50% worse on average, the cost of a quality-adjusted worker in India is still about 1/10<sup>th</sup> that of a worker in the US. This isn't all that different from how China's workers looked 20 years ago. Remarkably, even as wages in China have risen substantially, so too have education levels and the quality of education—today the quality-adjusted cost of a worker in China is still highly attractive. Within the developed world, the US looks to have the most attractive educated workers, despite the quality of a US high school education now being worse than in other developed countries. In contrast, Europe's educated labor appears to be the most expensive in the world by this measure. Despite quality being relatively good, the cost of workers there, particularly below college level, is high.



| Cost of a Quality Adjusted Educated Worker                |      |      |      |      |      |      |      |      |      |      |      |      |     |     |      |     |     |      |     |      |
|---|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|------|-----|-----|------|-----|------|
| Country   | IN   | CN   | TH   | RU   | MX   | KR   | BR   | HU   | AR   | SG   | GR   | US   | JP  | GB  | CA   | ES  | DE  | AU   | IT  | FR   |
| Cost of a Quality Adjusted Educated Worker rel. to the US | -93% | -86% | -82% | -70% | -64% | -57% | -54% | -53% | -45% | -26% | -18% | 0%   | 10% | 13% | 24%  | 51% | 64% | 70%  | 83% | 112% |
| Education Quality Relative to the US                      | -44% | 2%   | -21% | -1%  | -22% | 13%  | -27% | -2%  | -27% | 19%  | -7%  | 0%   | 15% | 3%  | 10%  | 0%  | 7%  | 3%   | 0%  | 3%   |
| % of Working Age Pop - Attained at least Primary School   | 65%  | 86%  | 75%  | 97%  | 80%  | 96%  | 80%  | 100% | 92%  | 82%  | 94%  | 99%  | 97% | 97% | 89%  | 97% | 97% | 93%  | 97% | 97%  |
| % of Working Age Pop - Attained at Least Secondary School | 34%  | 55%  | 32%  | 83%  | 36%  | 77%  | 36%  | 70%  | 42%  | 68%  | 54%  | 90%  | 72% | 73% | 76%  | 44% | 76% | 69%  | 46% | 61%  |
| % of Working Age Pop - Attained at Least Tertiary School  | 5%   | 3%   | 10%  | 25%  | 10%  | 30%  | 6%   | 15%  | 3%   | 30%  | 23%  | 27%  | 19% | 15% | 23%  | 15% | 13% | 19%  | 7%  | 11%  |
| NGDP Per Capita rel. to US                                | 3%   | 13%  | 11%  | 29%  | 21%  | 49%  | 22%  | 26%  | 23%  | 108% | 43%  | 100% | 90% | 79% | 106% | 58% | 86% | 135% | 66% | 84%  |

| Cohort Level Costs   |      |      |      |      |      |      |      |      |      |      |      |    |      |      |      |      |      |      |      |      |
|--|------|------|------|------|------|------|------|------|------|------|------|----|------|------|------|------|------|------|------|------|
| Country  | IN   | CN   | TH   | RU   | MX   | KR   | BR   | HU   | AR   | SG   | GR   | US | JP   | GB   | CA   | ES   | DE   | AU   | IT   | FR   |
| Cost of Tertiary Educated Worker rel. to the US, Adj. for Ed. Quality  | -96% | -89% | -90% | -72% | -70% | -71% | -50% | -71% | -62% | -43% | -56% | 0% | -43% | -10% | -13% | -28% | -5%  | 17%  | -8%  | 20%  |
| Cost of Secondary Educated Worker rel. to the US, Adj. for Ed. Quality | -94% | -87% | -84% | -72% | -66% | -59% | -49% | -59% | -44% | -37% | -31% | 0% | -9%  | 7%   | 18%  | 17%  | 52%  | 67%  | 50%  | 87%  |
| Cost of Primary Educated Worker rel. to the US, Adj. for Ed. Quality   | -88% | -82% | -75% | -60% | -53% | -33% | -40% | -34% | -36% | 10%  | 16%  | 0% | 77%  | 44%  | 75%  | 105% | 134% | 115% | 131% | 176% |
| Cost of Literate, Uneducated Worker rel. to the US                     | -93% | -88% | -86% | -61% | -76% | -35% | -78% | -45% | -80% | 10%  | -31% | 0% | 109% | 8%   | 60%  | 29%  | 122% | 36%  | 27%  | 84%  |
| Cost of Illiterate, Uneducated Worker rel. to the US                   | -94% | -91% | -89% | -59% | -83% | -36% | -89% | -40% | -84% | -23% | -35% | 0% | 123% | 3%   | 56%  | 11%  | 131% | 24%  | 8%   | 88%  |

<sup>385</sup> While we would not put too much weight in the specific placement/ranking of a country for educational quality, where countries place across the range is indicative.

Below we take a more granular look at our measure for each cohort of education level, which we use to build up to the aggregate picture. This approach gives us a much richer picture. For example, in the US college-educated workers adjusted for quality are more expensive than college-educated workers in Spain. But at the high school level and below, workers in the US are much cheaper than those in Spain. And since that's where the competition occurs between most workers for these countries, overall the US comes out more attractive. We show below some other points we find interesting.

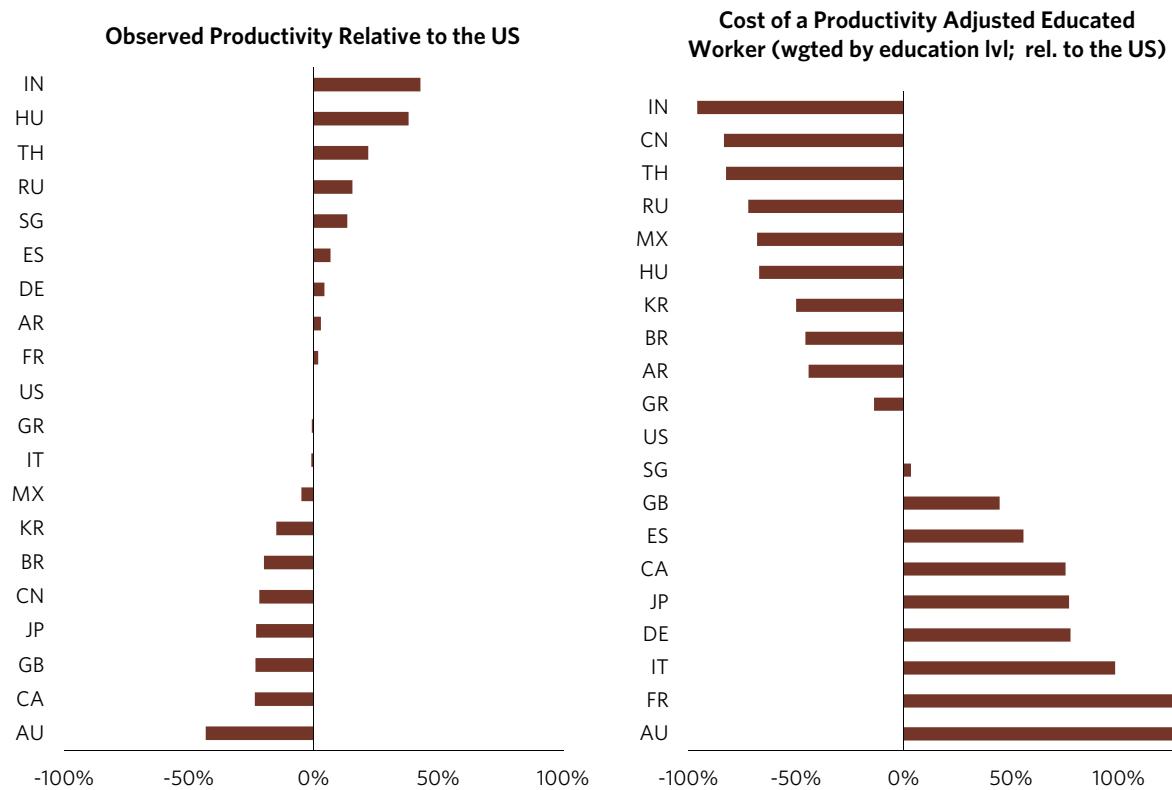
Both India's and China's workers cost a fraction relative to the US, and India's workers are 2/3 the cost of China's when adjusting for quality. India's workers are least costly at higher levels of education (especially tertiary).

| Educated Persons Cost Per Hour Worked, Adjusted for Education Quality<br>(Indexed to US, by Education Level) |        |          |             |         |          |            |
|--|--------|----------|-------------|---------|----------|------------|
| Country  | Wt Avg | Tertiary | Secondary   | Primary | Literate | Illiterate |
| IN   | -93%   | -96%     | -94%        | -88%    | -93%     | -94%       |
| CN   | -86%   | -89%     | 1/25 the US | -87%    | -82%     | -88%       |
| TH   | -82%   | -90%     | 1/25 the US | -84%    | -75%     | -86%       |
| RU   | -70%   | -72%     | -72%        | -60%    | -61%     | -59%       |
| MX   | -64%   | -70%     | -66%        | -53%    | -76%     | -83%       |
| KR   | -57%   | -71%     | -59%        | -33%    | -35%     | -36%       |
| BR   | -54%   | -50%     | -49%        | -40%    | -78%     | -89%       |
| HU   | -53%   | -71%     | -59%        | -34%    | -45%     | -40%       |
| AR   | -45%   | -62%     | -44%        | -36%    | -80%     | -84%       |
| SG   | -26%   | -43%     | -37%        | 10%     | 10%      | -23%       |
| GR   | -18%   | -56%     | -31%        | 16%     | -31%     | -35%       |
| US   | 0%     | 0%       | 0%          | 0%      | 0%       | 0%         |
| JP   | 10%    | -43%     | -9%         | 77%     | 109%     | 123%       |
| GB   | 13%    | -10%     | 7%          | 44%     | 8%       | 3%         |
| CA   | 24%    | -13%     | 18%         | 75%     | 60%      | 56%        |
| ES   | 51%    | -28%     | 17%         | 105%    | 29%      | 11%        |
| DE   | 64%    | -5%      | 52%         | 134%    | 122%     | 131%       |
| AU   | 70%    | 17%      | 67%         | 115%    | 36%      | 24%        |
| IT   | 83%    | -8%      | 50%         | 131%    | 27%      | 8%         |
| FR   | 112%   | 20%      | 87%         | 176%    | 84%      | 88%        |
| Dev. World   | 70%    | 1%       | 48%         | 136%    | 93%      | 89%        |
| EM. World  | -62%   | -70%     | -65%        | -49%    | -63%     | -67%       |

Cost of labor in Emerging World is less than half developed, and least expensive at lower education levels.

## Cost of a Productivity Adjusted Educated Worker

To triangulate our picture of the cost of an educated worker, we also look at the cost adjusting for observed differences in productivity (output per hour worked) rather than education quality. With this measure, we take the same approach of looking at the cost of the different cohorts. By adjusting for differences in observed productivity today we can get a better sense of the effective cost. Imagine you hire two workers of the same cost: one has a better education, but the other is more productive from day one on the job. This measure helps us weigh that second perspective, though it is somewhat less correlated with future incomes than our quality-adjusted measure, about 49%. Our measures are below. The overall picture isn't all that different. India looks even stronger on this measure since their observed productivity is quite strong. In contrast, Japan falls lower down.



| Cost of a Productivity Adjusted Educated Worker                |      |      |      |      |      |      |      |      |      |      |    |      |     |      |      |      |      |      |      |      |
|--|------|------|------|------|------|------|------|------|------|------|----|------|-----|------|------|------|------|------|------|------|
| Country  | IN   | CN   | TH   | RU   | MX   | HU   | KR   | BR   | AR   | GR   | US | SG   | GB  | ES   | CA   | JP   | DE   | IT   | FR   | AU   |
| Cost of a Productivity Adjusted Educated Worker rel. to the US | -96% | -83% | -83% | -72% | -68% | -67% | -50% | -46% | -44% | -14% | 0% | 3%   | 45% | 56%  | 75%  | 77%  | 77%  | 98%  | 126% | 156% |
| Observed Productivity rel. to the US                           | 43%  | -22% | 22%  | 16%  | -5%  | 38%  | -15% | -20% | 3%   | -1%  | 0% | 14%  | 7%  | -24% | -23% | 4%   | -1%  | 2%   | -43% |      |
| Cost of Tertiary Educated Worker rel. to the US                | -98% | -89% | -92% | -73% | -77% | -71% | -67% | -63% | -72% | -59% | 0% | -33% | -8% | -28% | -4%  | -34% | 2%   | -8%  | 24%  | 20%  |
| Cost of Secondary Educated Worker rel. to the US               | -97% | -86% | -88% | -72% | -73% | -60% | -54% | -63% | -59% | -36% | 0% | -25% | 10% | 17%  | 30%  | 5%   | 63%  | 50%  | 92%  | 72%  |
| Cost of Primary Educated Worker rel. to the US                 | -93% | -82% | -80% | -61% | -63% | -36% | -25% | -56% | -53% | 8%   | 0% | 31%  | 47% | 105% | 93%  | 104% | 151% | 129% | 184% | 122% |
| Cost of Literate, Uneducated Worker rel. to the US             | -93% | -88% | -86% | -61% | -76% | -45% | -35% | -78% | -80% | -31% | 0% | 10%  | 8%  | 29%  | 60%  | 109% | 122% | 27%  | 84%  | 36%  |
| Cost of Illiterate, Uneducated Worker rel. to the US           | -94% | -91% | -89% | -59% | -83% | -40% | -36% | -89% | -84% | -35% | 0% | -23% | 3%  | 11%  | 56%  | 123% | 131% | 8%   | 88%  | 24%  |

## Working Hard

Just like hard-working individuals, hard-working countries will generally be more productive and find ways to improve faster than those who are less hard working. We believe a country's work ethic impacts both the level of its relative advantage today and the pace at which it learns and improves over time. Working hard doesn't just mean working a lot of hours; it means having a certain ethic, a determination to achieve quality outcomes and to improve. Demographics can also impact the work ethic of a society—when a society ages and the number of dependents rises relative to those in the workforce, it can impact the overall work ethic of the society. Similarly, when there is a boom of young professionals, it can improve the vibrancy, initiative and determination of the society. We expect a country with a hard-working society that is low-cost to be more competitive and grow faster than a country with a population that prefers leisure and is expensive.

To construct a simple measure of working hard, we look at two pieces, 1) average weekly hours of actual work by men in the labor force, adjusting for things like vacation time and holidays, and 2) shifts in the amount of the population as a whole that is working. While the number of hours worked is just one measure of the effort a country puts in, and doesn't account for the determination and effort put in during those hours, it gives us a decent starting point; we return to some other measures that triangulate our picture when we look at culture. Just using this gauge on its own yields a 53% correlation with future growth, but when combined with cost indications, it is 66% correlated with subsequent 10-year growth.

We look at our aggregate measure below first, followed by components. Emerging Asian workers are generally the hardest workers in the world, including China, India and Thailand. Mexico also stands out as particularly hard-working. Among the richer countries, Singapore is by far the hardest working (competitive with much poorer countries), and Japanese workers are some of the most hard-working of developed countries, followed by the English-speaking developed countries. Continental European workers are generally the least hard-working in the world. Adjusting for cost largely keeps these divergences in place, though India's relative cheapness makes it look more attractive.



## Working Hard Subcomponent: Average Hours Worked

When looking at whether a country works hard, we look at the portion of the population working, and then how many hours each of those workers puts in. Regrettably, we must look at this measure for just men in the labor force because different social norms across countries around women in the workforce distort the numbers, and we must adjust for things like labor force participation, vacation time and holidays where data is limited. Again, these measures are designed to be simple—we triangulate them when we look at work ethic as part of the concepts of self-sufficiency and achievement orientation in our culture indicator.

When we look at hours worked on its own, Thailand, India and China are at the top, with Mexico not far behind and Singapore by far the hardest working of the wealthier countries. The Europeans work the least. Japanese workers, who used to be among the very hardest working in the world, still rank well on this metric but are now towards the middle. When we look at this measure of working hard adjusted for cost, we see some countries really stand out on either end—the dollar cost of effort, if you will, is particularly attractive in India, and especially bad in Europe.



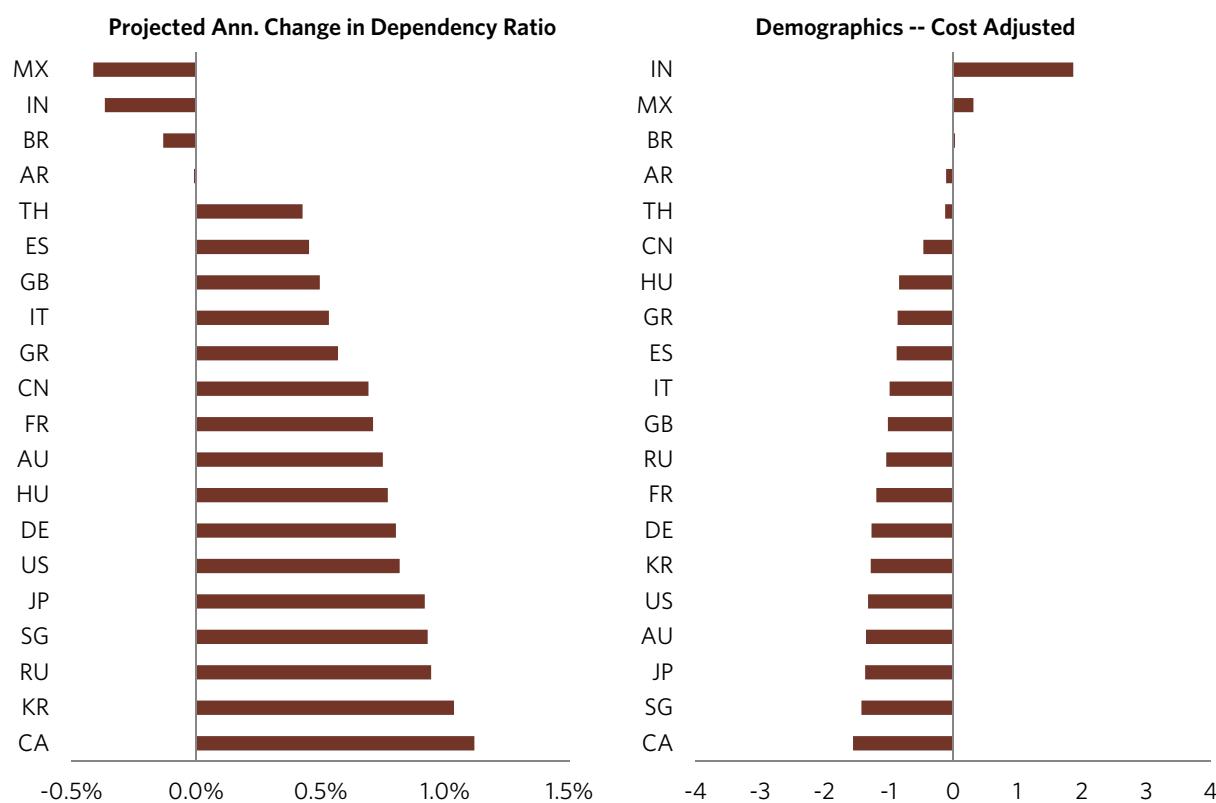
| Country  | TH  | CN  | SG  | MX  | IN  | AR  | JP  | BR  | KR  | CA  | GB  | AU  | US  | RU  | GR  | DE  | ES  | IT  | HU  | FR  |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Avg. Actual Hours Worked per Working Aged Male | 40  | 35  | 35  | 35  | 37  | 29  | 31  | 28  | 29  | 24  | 23  | 27  | 24  | 25  | 18  | 20  | 20  | 21  | 17  |     |
| Male Reported Avg. Hours Worked (ex Vacation)  | 51  | 47  | 46  | 46  | 47  | 44  | 45  | 38  | 41  | 36  | 37  | 39  | 37  | 38  | 43  | 30  | 34  | 36  | 37  | 31  |
| Male Labor Force Participation                 | 81% | 78% | 78% | 80% | 81% | 75% | 70% | 81% | 72% | 71% | 69% | 72% | 70% | 71% | 63% | 66% | 67% | 59% | 60% | 62% |
| Unemployment Rate (10yr Avg.)                  | 1%  | 4%  | 2%  | 4%  | 4%  | 9%  | 4%  | 8%  | 3%  | 7%  | 5%  | 7%  | 7%  | 7%  | 10% | 9%  | 16% | 8%  | 9%  | 9%  |

## Working Hard Subcomponent: Demographics

There is a natural cycle to how hard a person works and what they contribute, and typically one's working years are the most hard-working and productive ones. So it follows that societies go through long ebbs and flows in terms of how hard they work in aggregate, based on how much of that society is of working age versus very young or old and dependent.

Demographic pressures are measured by the projected change in the dependency ratio over the next 10 years. This represents the projected rise or decline in the proportion of a country's population that is young or old relative to those of working age. Our expectation is that a rise in the proportion of dependents (e.g., elderly individuals) would be a negative for the overall work effort in society and thereby for growth, all else equal.

In general, most major developed countries in the world today are likely to see a drag on their future growth in income per worker from these demographic shifts, due to increasingly aging populations. This impact is particularly acute for Japan but significant in the US, Europe, and UK. The picture is more mixed in the emerging world. Demographic pressures are a support in India but a drag in China, Russia and Korea, due to their aging populations. Adjusting for cost levels exacerbates the negative picture for the developed world. In the emerging world India is the one country that stands out as having a positive pressure after adjusting for cost; the pressure looks more muted in most of the rest, including China.

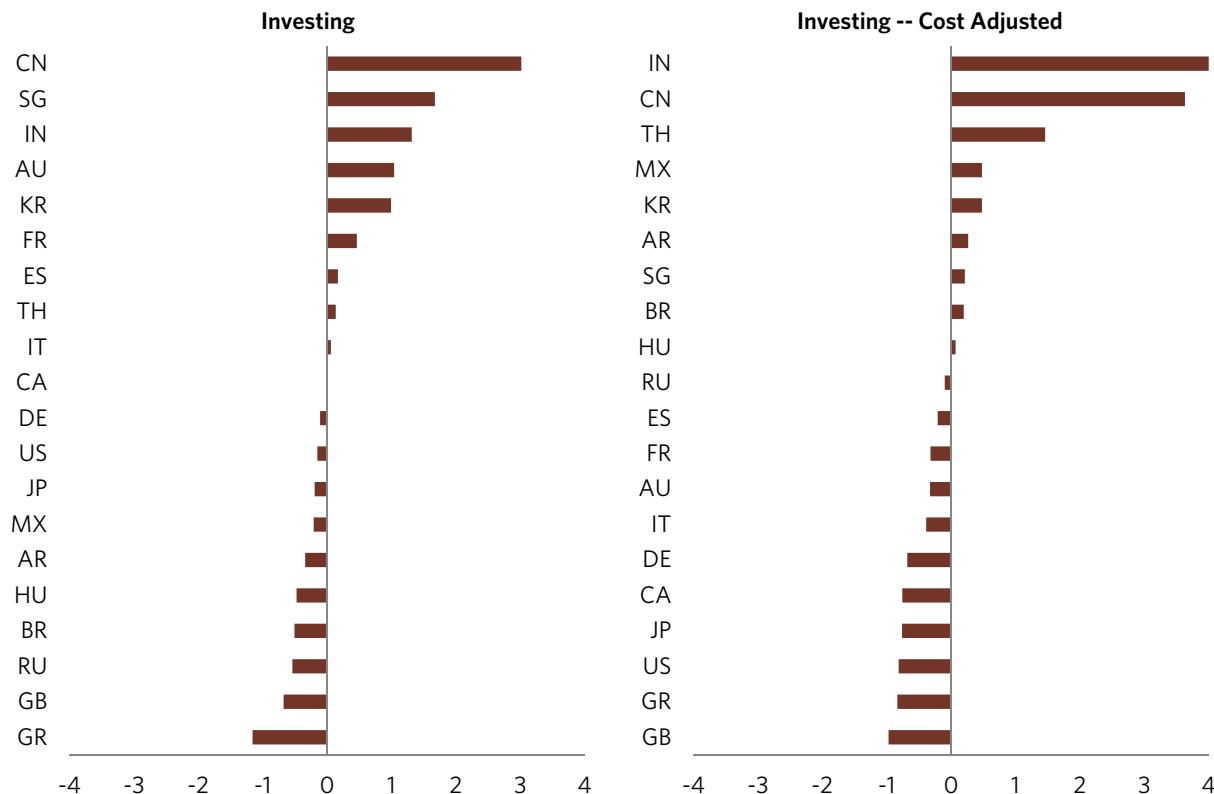


## Investing

Countries that save and invest in their future tend to grow faster by creating capital equipment and infrastructure that helps improve the productivity of their workforce relative to other countries with more limited investment rates. Further, high rates of savings provide the capital needed to invest in the most innovative companies. Of course, there are always risks that this investment is unproductive. Typically the investments that yield the most productivity gains occur in emerging countries that are just becoming rich. At this stage, the investments are not just inexpensive; the stock of infrastructure and other physical capital is also typically low and there is lots of room to adopt existing technologies that can radically improve the country's potential.

Investing is measured by looking at 1) the rate of total non-residential fixed investment in a given economy and 2) the household savings rate. Looking at investing on its own has historically had a 20% correlation with future growth, but when combined with cost it has had a 59% correlation with future growth.

The rate of Chinese investment and savings is the highest in the world, though increasingly inefficient. The development of modern infrastructure and increasing business investment has been an important contributor to the productivity growth of the Chinese workforce over the last few decades—though an increasing share of this investment is going to less productive uses. The UK, Japan and the US are on the lower end of investing rates for the developed world. Brazil, Hungary and Russia have some of the lowest investment rates in the emerging world (with investment in Brazil and Hungary particularly depressed and much of the investment in Russia oriented toward resources and related infrastructure). When you consider how inexpensive it is to make investments in many emerging countries, how limited their existing stock of capital is, and how early they are in adopting existing technologies, not to mention building their own, India and China really stand out. On the flipside, we become more concerned about the US and Japan maintaining their technology advantage when we consider their expense and their lower levels of investment. (The innovativeness of countries is a question we return to in culture, and on that dimension both countries look more promising.)



## Investing Subcomponents: Aggregate Fixed Investment Rates

The impact of investing on long-term prosperity takes time to flow through, so when we look at investment rates in a country we want to see what the trend has been, not just what happened recently. And we want to pay attention to the level of investment rates, not the wiggles. Moreover, not all types of investment produce income. While it's hard to assess that well, one thing we know is that real estate investments are generally not productivity enhancing, so we want to exclude those as best we can.

For these reasons we measure the rate of investment for a given country by looking at the average level of fixed investment as a percentage of GDP in the economy over the last seven years, stripping out residential real estate.

As highlighted above, on this measure China is ranked at the top. The US and Germany are towards the bottom—investment levels in those countries stagnated for some time. The impact of adjusting for cost puts India at the top just above China, but Germany and the US remain near the bottom, and Japan is modestly above them.

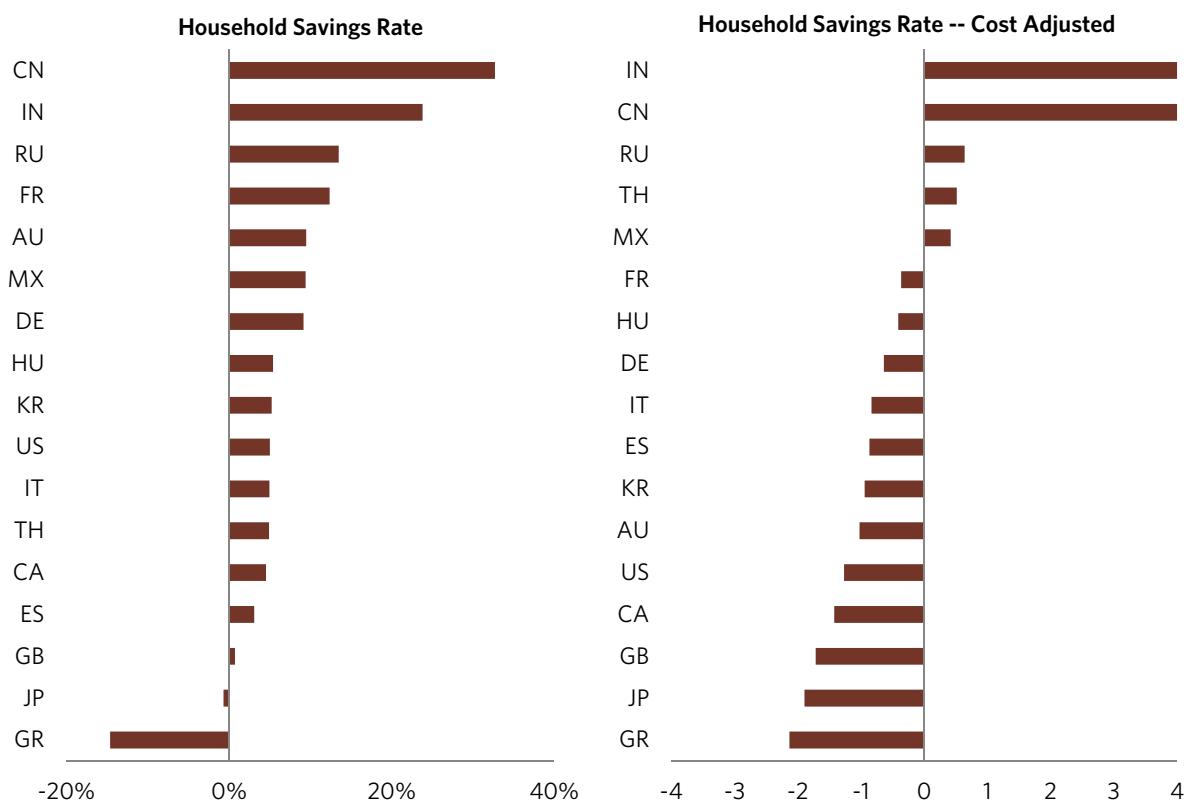


## Investing Subcomponents: Household Savings Rates

Savings provide financing for investments, so measuring savings provides another perspective into the resources a country has to productively invest. When you look at a country that is saving a lot when it is still poor, that is the period that its savings typically yield the highest productivity gains, for the reasons we have explained. Patterns of savings also relate to countries moving through the process described previously—countries that are fast becoming rich tend to save a lot, and richer countries past their peak tend to draw down their savings.

We measure the propensity for households to save by looking at average household savings as a percentage of household income over the last seven years.

Once again, China and India rank at the top for household savings. Major European countries measure as having fairly high household savings rates relative to other developed countries, while household savings rates in the US are notably lower. Adjusting for cost levels again exacerbates the differences between the emerging and developed world along this dimension, with the high level of Indian and Chinese savings standing out and savings rates in the US and Japan quite low.



## Culture Components

Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform. While some people shy away from examining culture because it is perceived as a sensitive subject and/or that it's difficult to measure, I think those views are mistaken. I don't see any reason why we shouldn't look at culture objectively as we do any other element of an economy; also, it can be well measured. I think that it's unfortunate that this important influence on economic well-being has not been well studied.

To be clear, I don't mean to judge whether a culture is good or bad any more than I could judge whether working hard is a better way to live one's life than savoring the pleasures of life. I am, however, confident that people who prefer savoring life over working hard will work and produce differently in ways that we should understand. Similarly, it makes intuitive sense that countries that emphasize individual self-reliance and striving to achieve are more likely to succeed than countries that don't. Countries can also outperform if the people in them are more innovative in producing new products and ideas of value and more commercially minded in harvesting them. It makes fundamental sense that countries will underperform if they are corrupt, bureaucratic or if the rule of law is unsound. In this section we will look at the relationships between measures of such factors and future growth, and we will examine how different countries stack up against these measures and what that implies for their future growth rates.

Some additional observations worth noting are as follows: people in poorer countries typically appear to value achieving because they need to work hard to sustain themselves, but as countries get richer, people tend to put more emphasis on enjoying their success. On an individual level, people spend more time relaxing; nationally, you can see it in countries turning away from policies that maximize growth towards policies that try to make society more equal or protect the environment. There is a strong correlation between the quality of a system's institutions (whether the system works) and a country's level of income. Similarly, richer countries seem more innovative because they can afford to invest more in conducting research or educating researchers, and developed capital markets in rich countries make it easier to start businesses and reap the potential rewards.

Our goal with the culture indicator is to capture the essence of whether a country's culture is conducive to growth, regardless of the influence of their stage of development. So, for each dimension of our culture gauge, we take out the effect of income on that dimension (using income as a proxy for the country's development stage).

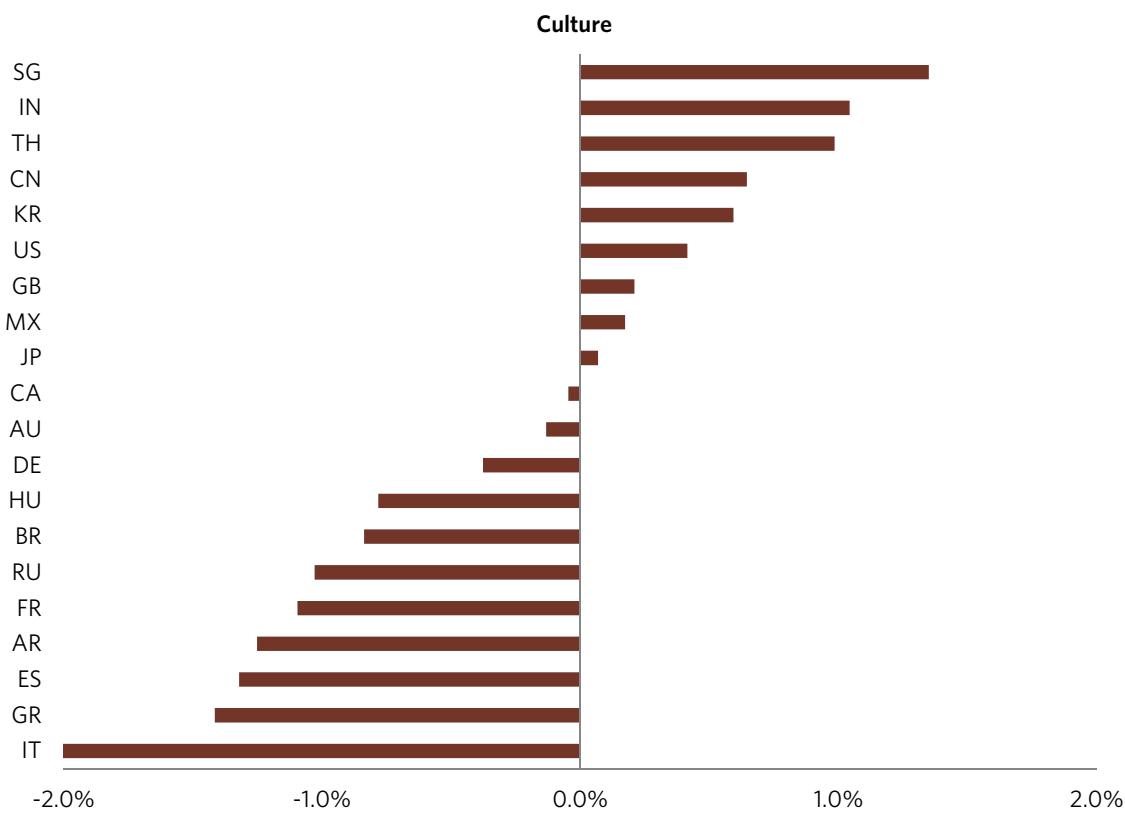
For the reasons we have described above, the culture gauge focused on the elements of culture we believe matter most for a country's future growth: 1) self-sufficiency, 2) savoring life versus achieving, 3) whether their society fosters innovation and commercialism, 4) bureaucracy, 5) corruption and 6) rule of law. For simplicity we put equal weight on each of our culture indicators, which balances measures related to the motivations of the individual and how the system operates. Because we took out the effect of income, each of the pieces is correlated to growth without being correlated at all to the income level of the country. The table below summarizes our weighting of the various gauges. Overall this gauge is about 58% correlated with future growth.

| Culture/Values  | Correlation to Growth | Contribution to Estimate |
|---|-----------------------|--------------------------|
| <b>Aggregate</b>  | <b>58%</b>            | <b>20%</b>               |
| Self-Sufficiency Excluding Income Effect (3 pieces, 9 sub-pieces) | 42%                   | 3.3%                     |
| Savoring Life vs. Achieving Ex. Inc. (2 pieces, 8 sub-pieces)     | 40%                   | 3.3%                     |
| Innovation & Commercialism Ex. Inc. (2 pieces, 10 sub-pieces)     | 49%                   | 3.3%                     |
| Bureaucracy Ex. Inc. (3 pieces)                                   | 32%                   | 3.3%                     |
| Corruption Ex. Inc. (4 pieces)                                    | 58%                   | 3.3%                     |
| Rule of Law Ex. Inc. (4 pieces)                                   | 57%                   | 3.3%                     |

Again, the way we think about culture is that a country's competitiveness and productivity is mainly a function of its value proposition, but culture can be a drag or additional boost. So we use our gauge of culture to adjust our measure of a country's productivity by shifting it up or down based on whether the country's culture is likely to be a pressure for the country to perform above or below its potential (we call it a "bump" for lack of a better term).

Below we look at our culture indicator's current readings before diving into its individual pieces and describing in more depth our logic behind them.

Culture shifts our predictions for future growth some. Based on this gauge, culture is the strongest support to growth in Asia, particularly in Singapore, India, Thailand, Korea, and China. Singapore's culture is strong across all four of our measures. In contrast, China's institutions aren't nearly as effective (due to bureaucracy and corruption), but China's culture shows an extremely strong work ethic, desire to achieve and self-sufficiency. For Korea, its orientation toward innovation and work ethic offset relatively weak institutions. The US stands just behind Korea with a highly innovative spirit and achievement orientation, but with a system that prioritizes redistribution over maximizing growth. Culture is a more moderate support in Japan, more neutral in the rest of the English-speaking developed world and Germany, and a drag in Latin America and most European countries, especially the periphery. In Europe's periphery, corruption, a focus on savoring life, relatively low self-sufficiency, and stagnant commercial and scientific environments appear to be a material drag on growth. Russia and Argentina, two of the countries where our measures of what you pay versus what you get are attractive, also score near the bottom of the list because of corruption in Russia, and low self-sufficiency and a high value on savoring life relative to achieving in Argentina.<sup>386</sup>



<sup>386</sup> Again, what we are showing is the adjustment (or "bump") to the productivity estimate we make based on a country's culture (e.g., based on our assessment of what you pay for what you get for Singapore's labor, we would project growth in income per worker of about 2.3%, but we add another 1.3% based on our assessment that Singapore's culture is very supportive to growth).

## Self-Sufficiency

It is both logical and consistent with the evidence to believe that self-sufficiency (i.e., the need and the ability to independently support oneself) is an important ingredient for individuals and societies to be successful. It is not controversial to say that people spend the money that they earn differently than the money that others give them—i.e., that the connection between earning and spending is a healthy one. If people have to earn money to spend it, they have to be more productive. Over the long run, living standards rise as a function of increases in productivity. So, it is not a big leap to presume that countries with greater amounts of self-sufficiency do better than those with less. Since self-sufficiency creates capability and independence in addition to fostering increased production, it also produces self-esteem. For these reasons, it is logical to conclude that self-reliance is rewarding, both economically and psychologically. The evidence clearly shows this to be true.

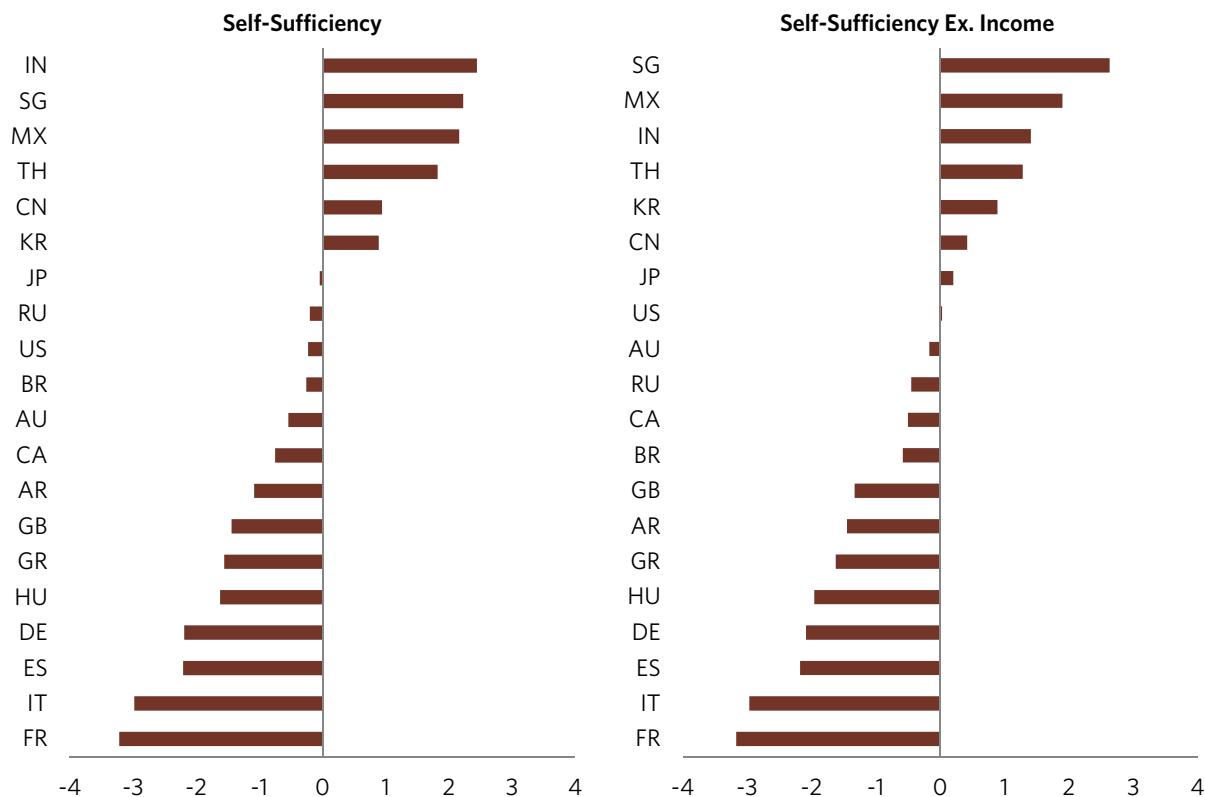
Below, we show how self-sufficiency varies by country and how it has been correlated with subsequent economic growth. You will see that there are significant differences in self-sufficiency levels between countries and that these differences occur for different reasons. For example, in some cases they are chosen (e.g., the amounts of transfer payments developed economies have are largely chosen) while in other cases they are not (e.g., high self-sufficiency in the poorest societies is primarily the result of necessity rather than choice). Nonetheless, the evidence is clear. Societies in which individuals are more responsible for themselves grow more than those in which they are less responsible for themselves.

To measure self-sufficiency, we weigh 50% how hard a society works and 50% the system of supports and protections, which is a function of the magnitude of government supports and how rigid labor markets are (e.g., how easy it is to hire and fire). While no one of these perfectly measures self-sufficiency, together they paint a picture that is highly indicative. Once we used the process below to construct a score, we took out the role income plays in encouraging self-sufficiency and used the resulting measure in our culture indicator. Overall our indicator of self-sufficiency is about 42% correlated to growth once you strip out the effect income has on self-sufficiency. Prior to excluding the income effect, our indicator of self-sufficiency was about 50% correlated to future growth.

| Self-Sufficiency                                | Correlation to Growth | Contribution to Estimate |
|---|-----------------------|--------------------------|
| <b>Aggregate Ex. Income Effect</b>              | 42%                   | 100%                     |
| <b>Aggregate</b>                                | 50%                   | --                       |
| <b>Work Ethic</b>                               | <b>49%</b>            | <b>50%</b>               |
| Average Hours Worked                            | 53%                   | 25%                      |
| Labor Force Participation                       | 32%                   | 8.3%                     |
| Effective Retirement Age (% of Life Expectancy) | 20%                   | 8.3%                     |
| Actual Vacation + Holidays Per Year             | 48%                   | 8.3%                     |
| <b>Government Support</b>                       | <b>44%</b>            | <b>25%</b>               |
| Transfer Payments to HH, % PGDP                 | 62%                   | 12.5%                    |
| Gov Outlays as % of PGDP                        | 46%                   | 12.5%                    |
| <b>Rigidity of Labor Market</b>                 | <b>13%</b>            | <b>25%</b>               |
| Unionization as % of Workforce                  | 8%                    | 8.3%                     |
| Ease of Hiring/Firing                           | 21%                   | 8.3%                     |
| Minimum Wage as % of Average Income             | -23%                  | 8.3%                     |

Note: the correlation of transfers to future growth is for a shorter time period and smaller sample set, and will have some bias because of countries with lower growth having higher transfers.

The charts below convey those countries that are most self-sufficient today. As shown, India and Singapore are measured as most self-sufficient, followed by other Asian countries and Mexico. The US is towards the middle, and European countries are the least self-sufficient. The chart below shows these ratings. Look at it to see if you are surprised and note those surprises so that you can see what they are attributable to when we show you the composition of our barometer. For example, you might find it notable that "communist" China has greater self-sufficiency than the capitalist US. This is the case in both outright terms and once you adjust for income.

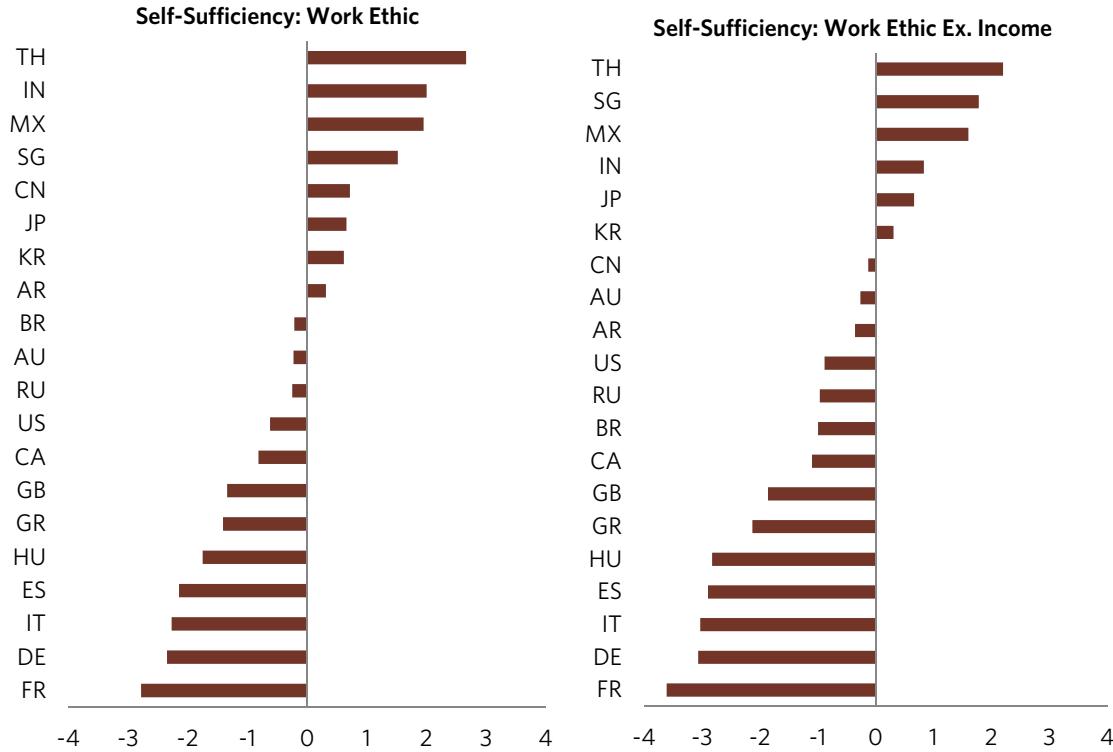


## Self-Sufficiency Subcomponent: Work Ethic

Societies that are self-sufficient have a high percentage of their population working hard each day to be self-reliant. People who work hard both produce more in the near-term and generally find ways to improve faster through time than those that care more for leisure. They also tend to exhibit a drive to earn what they consume, which is an essential quality of being self-reliant and generally successful in a market-based system.

While we think average hours worked accomplished our basic goal within productivity of getting a gauge of how hard people worked, here we wanted to capture a little more richness about the work ethic of each country, so we also looked at measures like the typical retirement age, how many vacation days people in each country typically take and male labor force participation on its own. Again, regrettably we must look at our hours worked and labor force measures for just men because different social norms across countries around women in the workforce distort the numbers. Since we expect richer countries to take more leisure than poorer ones, this is one of the measures we expect to have a fairly strong relationship with a country's income level.

When we scan across countries, we see emerging countries at the top of the list, including India and Mexico. Overall, emerging Asia comes through as working the hardest, followed by Latin America. Among rich countries, Singapore and then Japan have the hardest workers. The US is fairly hard-working among developed countries, whereas workers in Europe appear to opt for leisure more than anyone else based on these measures. Once we take into account the tendency for wealthier countries to take more leisure time, Japan really stands out as exceptionally hard-working (as do Korea and Singapore). Argentina and Brazil move down a bit. Still, the relative ordering of most countries is fairly stable since the differences in how hard each country works are fairly extreme. Any way you cut it, Mexico and India remain among the hardest-working countries and workers in Europe some of the most leisure-taking.

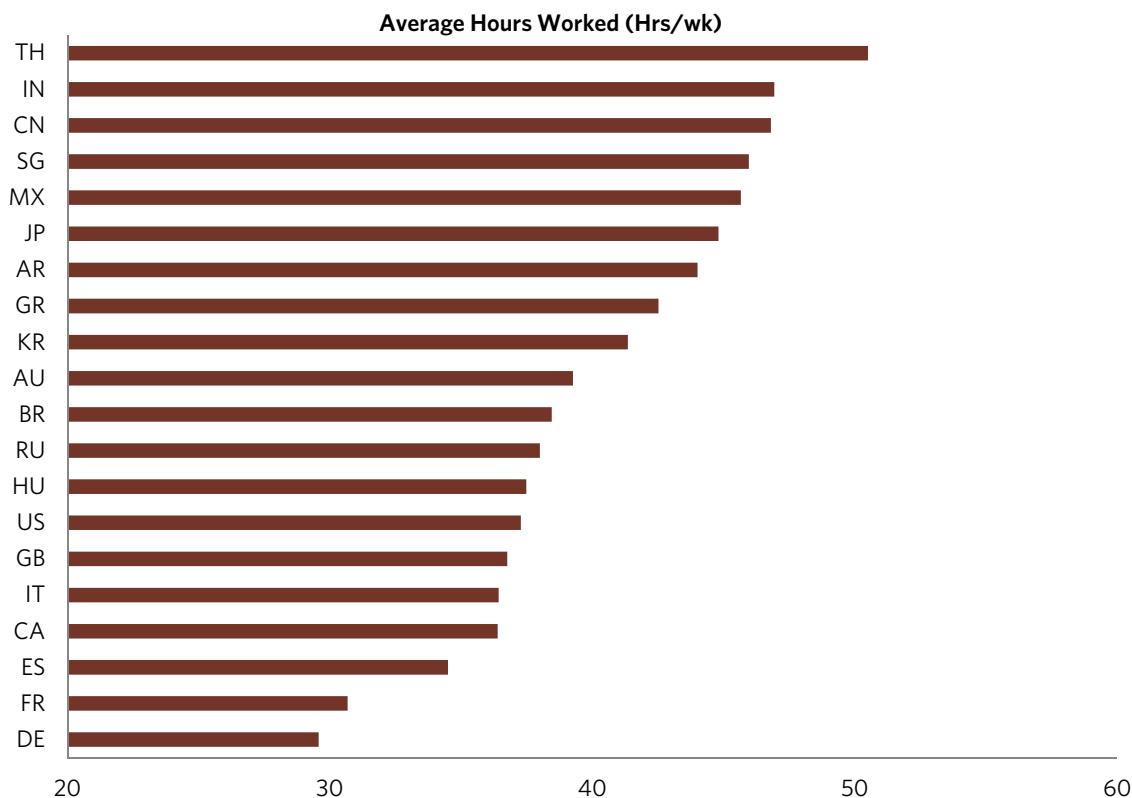


Below we show the individual pieces of our hard working gauge.

| Work Ethic Measures                                  |  | TH  | IN  | MX  | SG  | CN  | JP  | KR  | AR  | BR  | AU  | RU  | US  | CA  | GB  | GR  | HU  | ES  | IT  | DE  | FR  |
|--|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Avg. Actual Hours Worked (Hrs/wk)                    |  | 40  | 37  | 35  | 35  | 35  | 31  | 29  | 29  | 28  | 27  | 25  | 24  | 24  | 23  | 25  | 21  | 20  | 20  | 18  | 17  |
| Male Reported Avg. Hrs Worked (ex Vacation)          |  | 51  | 47  | 46  | 46  | 47  | 45  | 41  | 44  | 38  | 39  | 38  | 37  | 36  | 37  | 43  | 37  | 34  | 36  | 30  | 31  |
| Labor Force Participation (% Working Age Population) |  | 81% | 81% | 80% | 78% | 78% | 70% | 72% | 75% | 81% | 72% | 71% | 70% | 71% | 69% | 63% | 60% | 67% | 59% | 66% | 62% |
| Effective Retirement Age (% of Life Expectancy)      |  | --- | 92% | 98% | --- | 72% | 88% | 94% | 91% | 78% | 82% | 93% | 87% | 81% | 82% | 80% | 87% | 79% | 79% | 81% | 77% |
| Actual Vacation+Holidays Per Year (Weeks)            |  | --- | 2.3 | 1.9 | 2.0 | 2.6 | 1.0 | 1.6 | --- | 4.3 | 2.3 | 3.8 | 3.3 | 3.6 | 6.5 | 5.9 | 5.5 | 6.8 | 5.9 | 7.0 | 7.0 |

## Self-Sufficiency Subcomponent: Work Ethic – Average Hours Worked

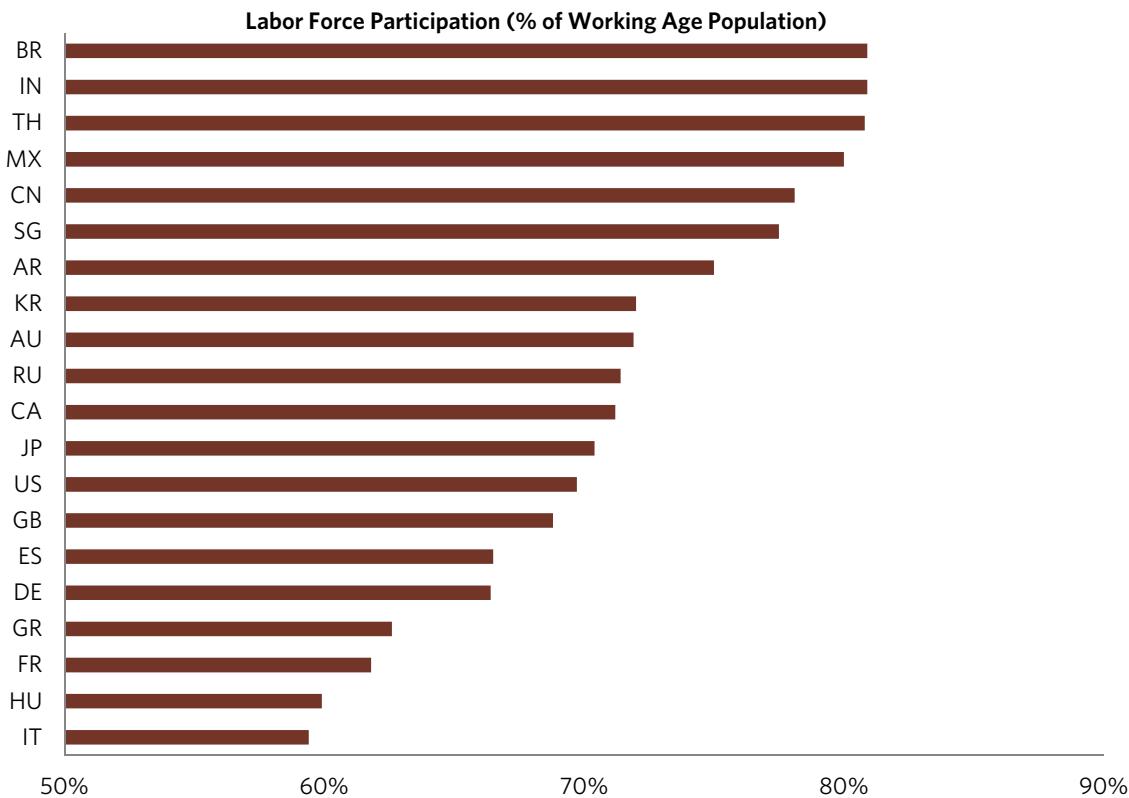
Hard work is a sign that someone is driven to be self-reliant, that he or she has grit. This determination is essential to having a society where self-sufficiency is promoted and rewarded. A simple way to see it is just by looking at how many hours those who have a job put in. This gives us a sense of how hard-working the employed members of a society are (and, more loosely, the society in aggregate). Below we zoom in on the simple measure: the average work week (we triangulate our picture with a broader set of measures next). On this measure we see emerging countries at the top of the list, including Thailand, India, and China. Overall, emerging Asia comes through as working the hardest, followed by Latin America. Among rich countries, Singapore and then Japan have the hardest workers. The US is fairly hard-working among developed countries, whereas workers in Europe appear to opt for leisure more than anyone else based on these measures.



| Avg. Hours Worked                              |  | TH  | CN  | SG  | MX  | IN  | AR  | JP  | BR  | KR  | CA  | GB  | AU  | US  | RU  | GR  | DE  | ES  | IT  | HU  | FR  |
|--|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Country  |  | 40  | 35  | 35  | 35  | 37  | 29  | 31  | 28  | 29  | 24  | 23  | 27  | 24  | 25  | 25  | 18  | 20  | 20  | 21  | 17  |
| Avg. Actual Hours Worked per Working Aged Male |  | 51  | 47  | 46  | 46  | 47  | 44  | 45  | 38  | 41  | 36  | 37  | 39  | 37  | 38  | 43  | 30  | 34  | 36  | 37  | 31  |
| Male Reported Avg. Hours Worked (ex Vacation)  |  | 81% | 78% | 78% | 80% | 81% | 75% | 70% | 81% | 72% | 71% | 69% | 72% | 70% | 71% | 63% | 66% | 67% | 59% | 60% | 62% |
| Male Labor Force Participation                 |  | 1%  | 4%  | 2%  | 4%  | 4%  | 9%  | 4%  | 8%  | 3%  | 7%  | 7%  | 5%  | 7%  | 7%  | 10% | 9%  | 16% | 8%  | 9%  | 9%  |
| Unemployment Rate (10yr Avg.)                  |  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

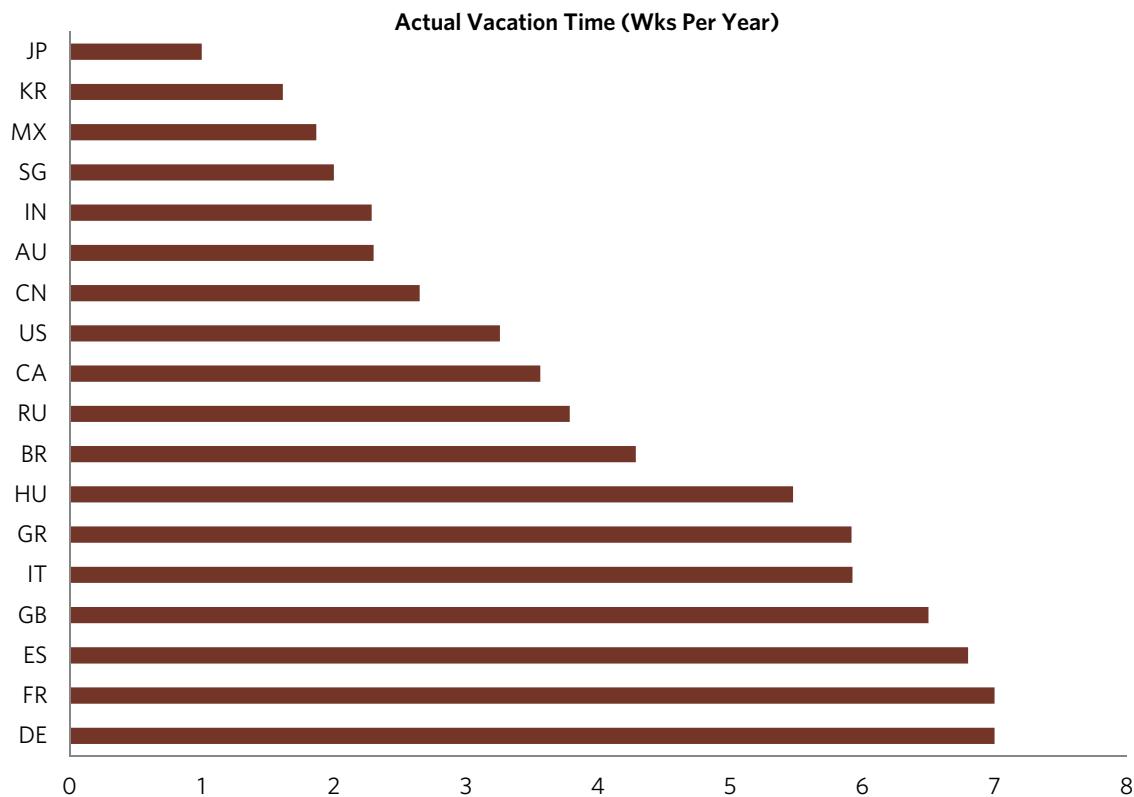
## Self-Sufficiency Subcomponent: Work Ethic – Labor Force Participation

Remember what we are trying to get at with this concept is the work ethic of a society, not just how much it is actually working. Labor force participation is one indication (albeit crude) of how much a society wants to work. It gives you a rough sense of what proportion of the society is actively looking for a job (though it may miss some who have the drive but are in the informal economy). Because of cultural differences across countries and data limitations, here again we are unfortunately limited to looking at male labor force participation. By and large the emerging world has much higher male labor force participation rates than the developed world, though there are exceptions. Brazil, India, Thailand, Mexico and China have some of the highest rates (all around 80%). There is still a high participation of men in the workforce in Singapore (above 75%), despite its wealth. Japan has a high male labor force participation rate among developed countries (above 70%, though its female participation is low compared to other developed countries). This measure is a bit lower in the US and UK. Labor force participation is lowest among men in Western Europe, particularly Italy, France and Greece (60% to 65%), though Germany and Spain are not far behind, along with parts of Eastern Europe, especially Hungary.



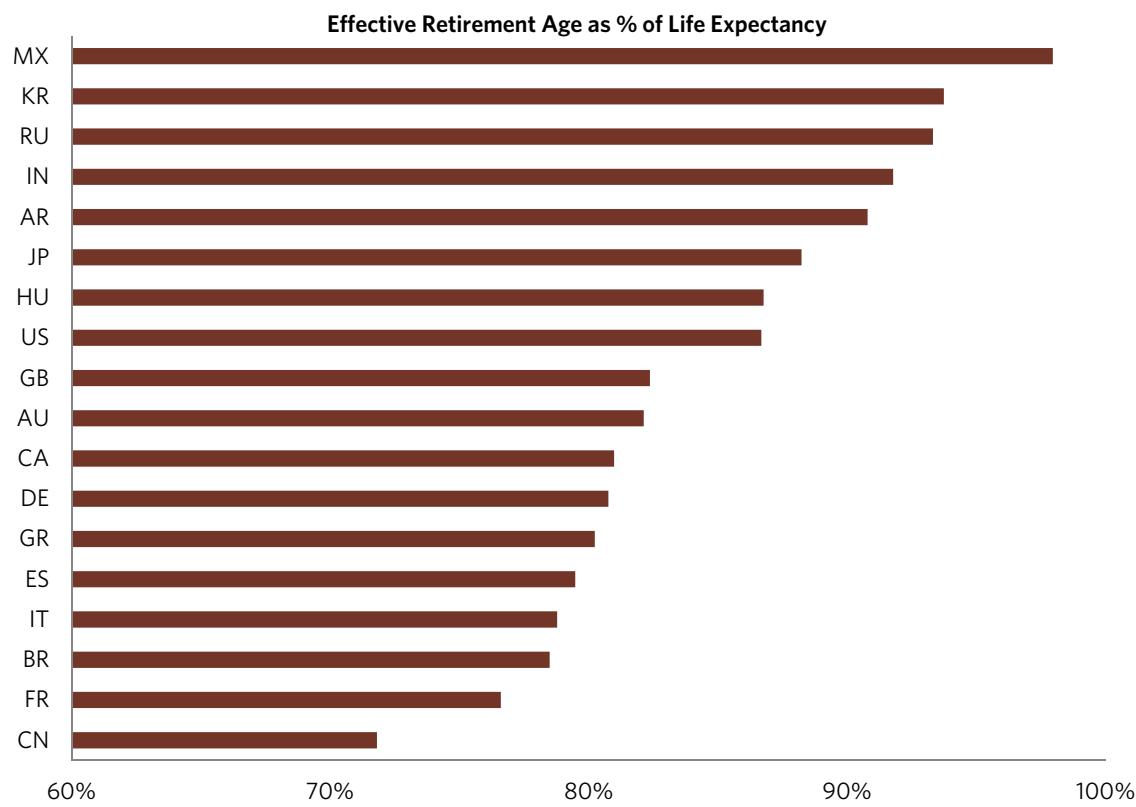
## Self-Sufficiency Subcomponent: Work Ethic – Actual Vacation Time

How much vacation a society takes each year is just another intuitive measure of how much it values leisure versus hard work and its rewards. When we look at this measure, the picture isn't all that different from what we have seen so far. Japanese workers appear to take very few vacations (about one week per year on average), consistent with a strong work ethic reflected in our other measures. India and China are toward the top of the list, with the average vacation time around two weeks per year. The norm in the US is about three-and-a-half weeks. German, French and Spanish workers appear to take the most vacation, with Italian and Greek workers not far behind. On average, Europeans take six to seven weeks of vacation per year.



## Self-Sufficiency Subcomponent: Work Ethic – Retirement Age as Percentage of Life Expectancy

One dimension of how hard you work is how many days you put in each year, but another is how long you work over the course of your lifetime. To capture this we want to look at when people tend to retire in a society relative to their life span. We measured this by looking at the effective retirement age as a percentage of life expectancy. Interestingly, this picture shows some notable differences from the earlier patterns we saw and appears less related to a country's income (a simple measure of its stage of economic development). While the countries at the top are mostly emerging, Japan and the US are ahead of many low-income countries. Japanese and US workers appear to work to 85% or more of their life expectancy before retiring. On the other hand, workers in China retire much earlier, working closer to 70% of their life expectancy before retirement. Consistent with other measures, Europeans fall in the bottom half of this measure.

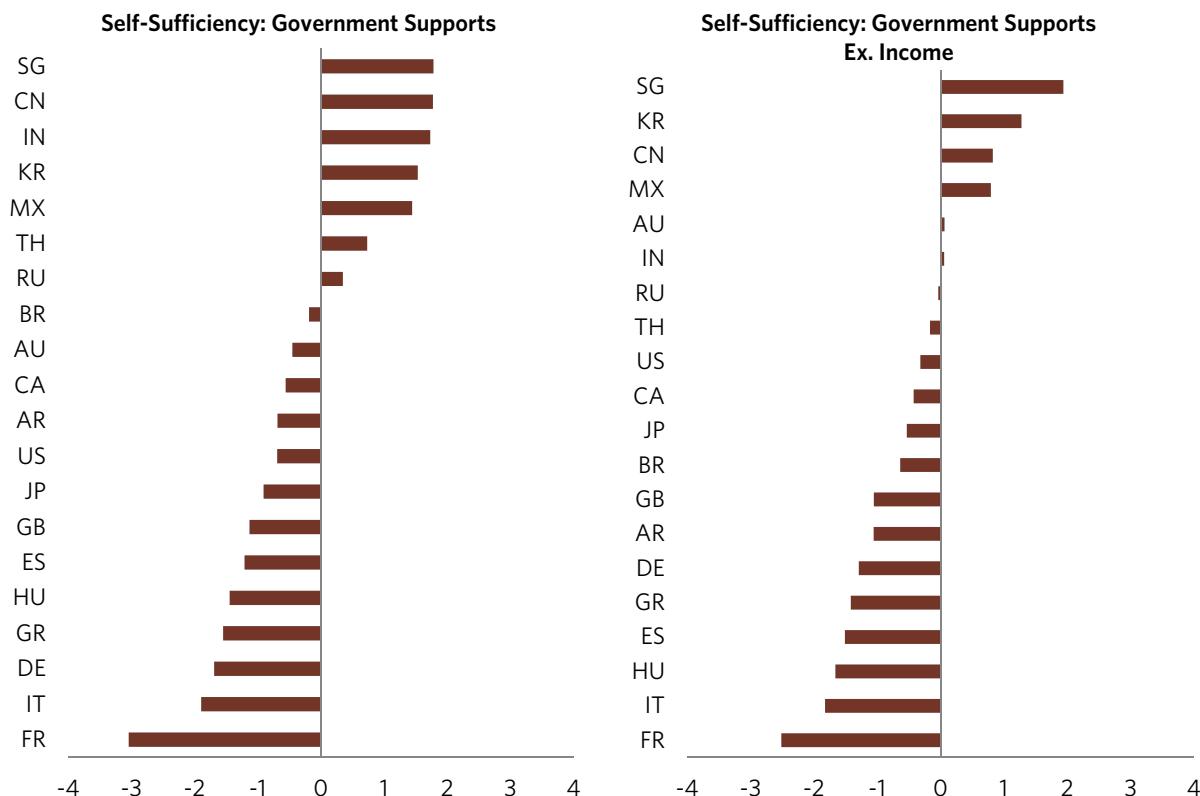


## Self-Sufficiency Subcomponent: Government Supports

A country's government policy both tells you something about what it values, and also shapes the incentives and motivations of its citizens. In general, societies that value self-reliance highly will provide less public support. And large government supports, directly through transfers that redistribute incomes or indirectly through services, are the primary means of enabling individuals to consume more than they earn. These supports risk undermining self-reliance, which is such a fundamental value in a market-based system (i.e., the drive to earn your keep). To be clear, we aren't arguing for or against such payments; we are just measuring self-sufficiency and, since this is one of the biggest influences on it, it is a significant part of our gauge. For these reasons, we would expect countries that have fewer transfers, smaller welfare systems and more limited social services to grow faster than those that place a higher priority on redistribution and government safety nets.

We measure the degree of government supports in a society in a few ways, looking at the magnitude of its outlays (which often include indirect transfers in the way of services, for example) and the magnitude of its direct transfers to households. As countries develop and get richer, they tend to weigh considerations like redistribution more heavily, so this is another measure where we expect and find a fairly strong relationship between the country's income and its level of government supports, which we control for to account for the stage of development the country is in and get a sense of the underlying ethic.

In our current rankings, emerging Asia holds the top four spots, with European countries ranking as the least self-sufficient along this measure. Once you exclude the effect of income, this pattern basically holds, though the developed English-speaking world moves up some, particularly Singapore, whose limited amount of government supports is unusual given the wealth of the country. Italy and France end up looking particularly bad on this measure.

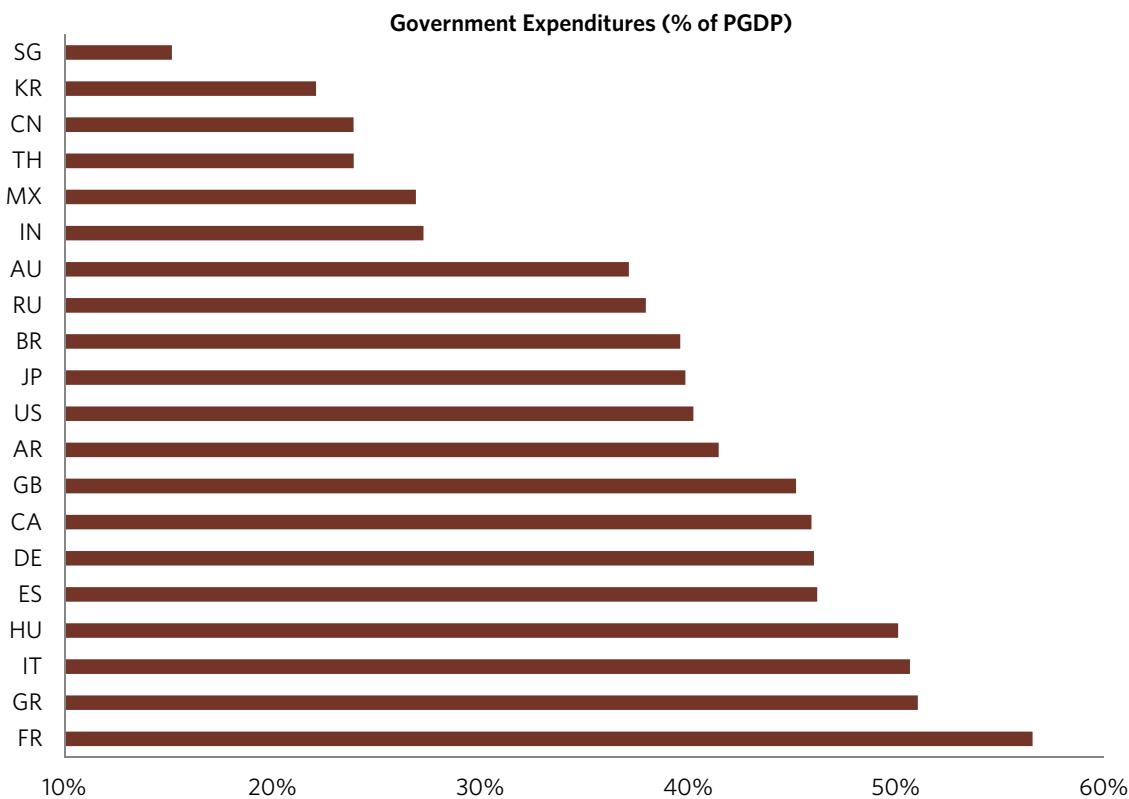


In the table below, we show how each country ranks along the sub-pieces of our government supports measure.

| Country                         | SG  | CN  | IN  | KR  | MX  | TH  | RU  | BR  | AU  | CA  | AR  | US  | JP  | GB  | ES  | HU  | GR  | DE  | IT  | FR  |
|---------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Transfer Payments to HH, % PGDP | --- | 6%  | 5%  | 9%  | 7%  | --- | 12% | 16% | 20% | 18% | --- | 20% | 22% | 24% | 27% | 22% | 22% | 26% | 28% | 33% |
| Gov Outlays, % PGDP             | 15% | 24% | 27% | 22% | 27% | 24% | 38% | 40% | 37% | 46% | 41% | 40% | 40% | 45% | 46% | 50% | 51% | 46% | 51% | 57% |

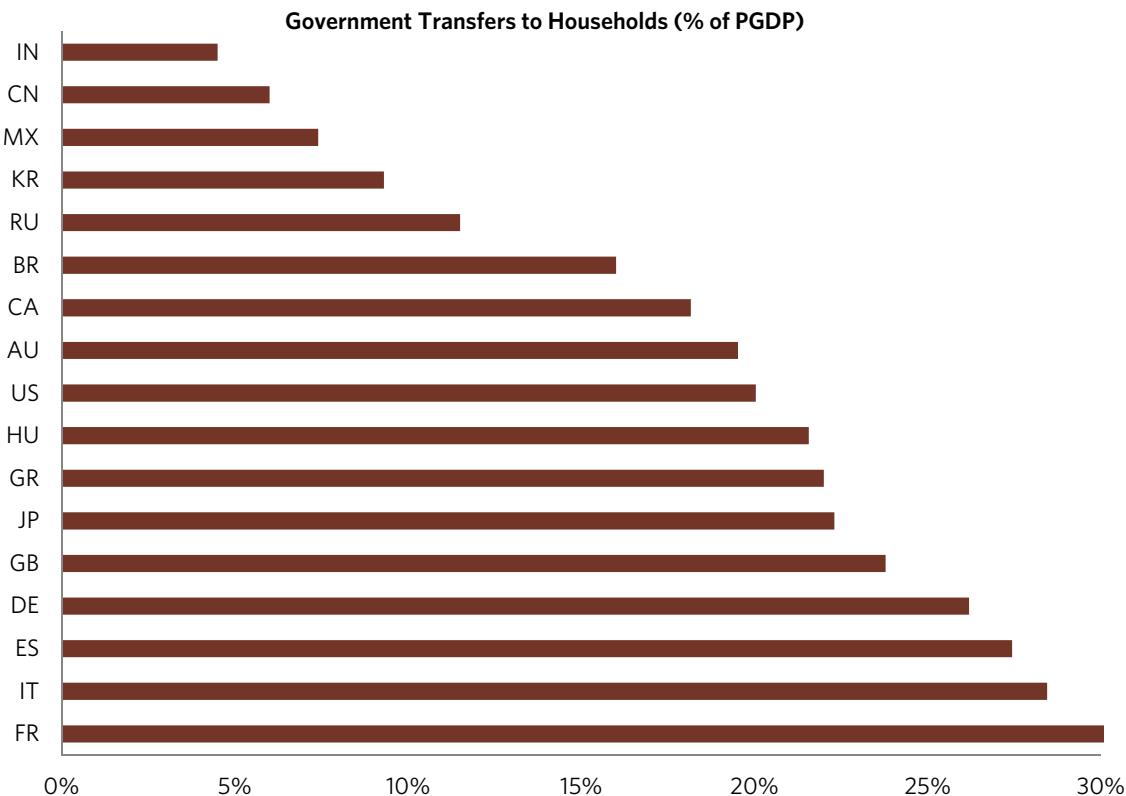
## Self-Sufficiency Subcomponent: Government Supports – Government Expenditures

Government outlays are a broad indication of the support a government provides to those in society. While not direct (as, say, pure household income transfers), many of these outlays are redistributive, providing, for example, higher-value services than what a number of recipients contributed in the form of taxes. These measures can both reflect societal attitudes around self-reliance and impact these values. On this measure, we see that many of the emerging Asian countries have very small governments relative to the size of their economies. Singapore's government spends a bit over 15% of GDP, and China's government doesn't spend that much more, about 20%. India is a bit lower down but still in the top quartile, with government spending around 25% of GDP. There is some variation among Latin American countries, with Mexico's government outlays at less than 25% of GDP, and Argentina's and Brazil's governments closer to 35%-40%, around the middle of the pack. Japan and the US are also in the middle. France and Italy are on the other end of the spectrum. Their governments spend between 50% and 55% of GDP.



## Self-Sufficiency Subcomponent: Government Supports – Transfers to Households

Household transfers are a direct subsidy and have an especially high risk of undermining self-reliance. The policy highlights the tradeoff of enforcing a market-based system to maximize growth versus risking slower growth to achieve a different goal, like ensuring a social safety net for ethical reasons or for social stability. On this measure, we see that India's and China's governments are the least redistributive, by our measures. In both countries transfers to households are around 5% of GDP. Transfers in the US and Japan are about four times larger, around 20% of GDP, but still much lower relative to the rest of the developed world. In Western Europe, transfers range from a bit under 25% to nearly 30% in France.

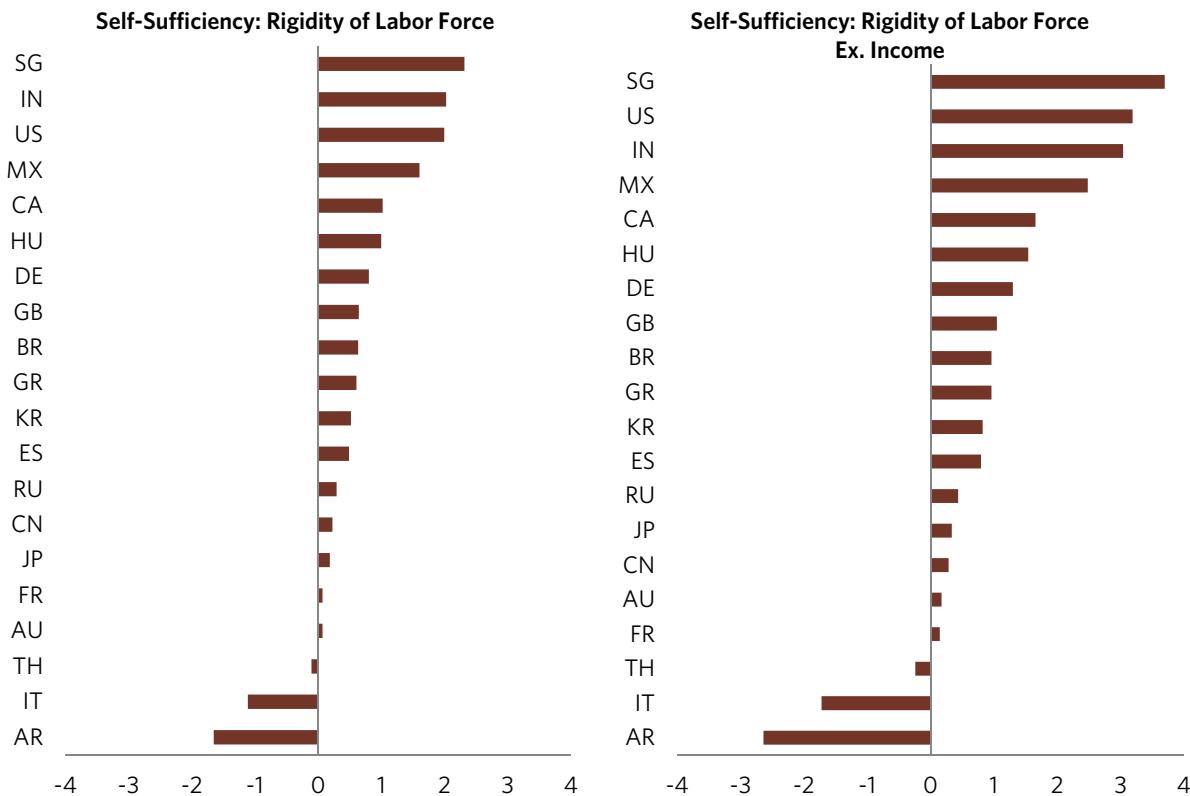


## Self-Sufficiency Subcomponent: Labor Market Rigidity

Support from the state to an individual can happen through either direct transfer payments and the provision of government services (as we examined above), or by regulating companies to provide workers with supports, e.g., enforcing a minimum wage or making it difficult to fire individuals. Unions can also work to protect certain workers. To the extent that these structural labor market supports limit companies from engaging with employees in a free manner (making hiring and firing decisions), it limits the need for individual self-reliance. And this approach limits the dynamism of corporations and individuals to respond to conditions—which over time should make countries with high rates of labor market rigidity grow more slowly.

We measure labor market rigidity by looking at unionization rates across countries, minimum wages, and limits to hiring and firing at will in a given economy. Unlike hard work or government supports, these measures tend to be fairly unrelated to a country's wealth and stage of development (which we proxy with income levels).

On our aggregate measure of labor force rigidity, Singapore, India and the US rank as having the least rigid labor forces, followed by Mexico. Argentina and Italy score especially poorly along this measure. Within the developed world, Japan and peripheral Europe appear to have some of the more rigid labor markets. It's also interesting to note that China appears to have a fairly rigid labor market, which is generally the exception (most other measures indicate that China has a high degree of self-sufficiency). Since labor force rigidity isn't particularly related to a county's stage of development, excluding income's effect has little impact on the rankings.

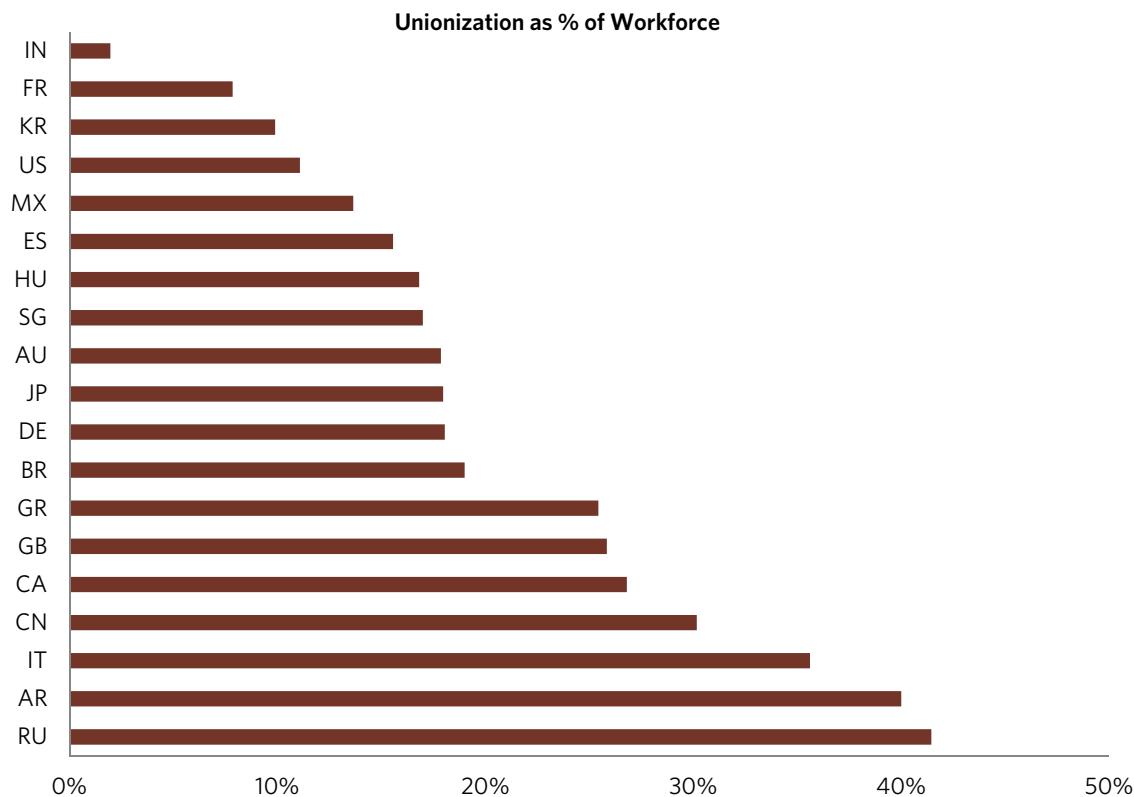


Below we show the values for each country for the three sub-pieces of labor market rigidity.

| Rigidity of Labor Market Measures   |     |     |     |      |     |     |      |     |      |      |      |      |     |     |      |      |      |     |      |      |
|-------------------------------------|-----|-----|-----|------|-----|-----|------|-----|------|------|------|------|-----|-----|------|------|------|-----|------|------|
| Country                             | SG  | IN  | US  | MX   | CA  | HU  | DE   | GB  | BR   | GR   | KR   | ES   | RU  | CN  | JP   | FR   | AU   | TH  | IT   | AR   |
| Unionization as % of Workforce      | 17% | 2%  | 11% | 14%  | 27% | 17% | 18%  | 26% | 19%  | 25%  | 10%  | 16%  | 41% | 30% | 18%  | 8%   | 18%  | --- | 36%  | 40%  |
| Ease of Hiring/Firing (Z)           | 3.3 | 0.9 | 2.2 | -0.4 | 1.8 | 0.9 | -0.5 | 1.5 | -0.6 | -0.1 | -0.2 | -0.6 | 0.5 | 1.3 | -1.1 | -1.7 | -1.1 | 1.2 | -1.6 | -1.4 |
| Minimum Wage as % of Average Income | --- | 15% | 19% | 8%   | 27% | 27% | 20%  | 32% | 23%  | 23%  | 33%  | 28%  | 24% | 37% | 29%  | 33%  | 31%  | 41% | 41%  | 51%  |

## Self-Sufficiency Subcomponent: Labor Market Rigidity – Unionization

While unions can help give workers a voice in negotiations with their employers, they also work to protect members from the pressures of others in the workforce and restrict overall labor force participation—all of which undermines self-reliance. As with other measures of labor market rigidity, unionization rates have little relationship with the income of a country. The measure shows different choices within countries of similar income. Unionization rates are low in the US and Mexico (close to 15% and below), though it's worth noting that our measures don't account for the strength of unions (which we understand to be strong in France, for example). Unionization rates are very high in Italy, Russia and Argentina (35% and higher). This is one of the few measures on which China ranks lower, with a unionization rate near 30%.



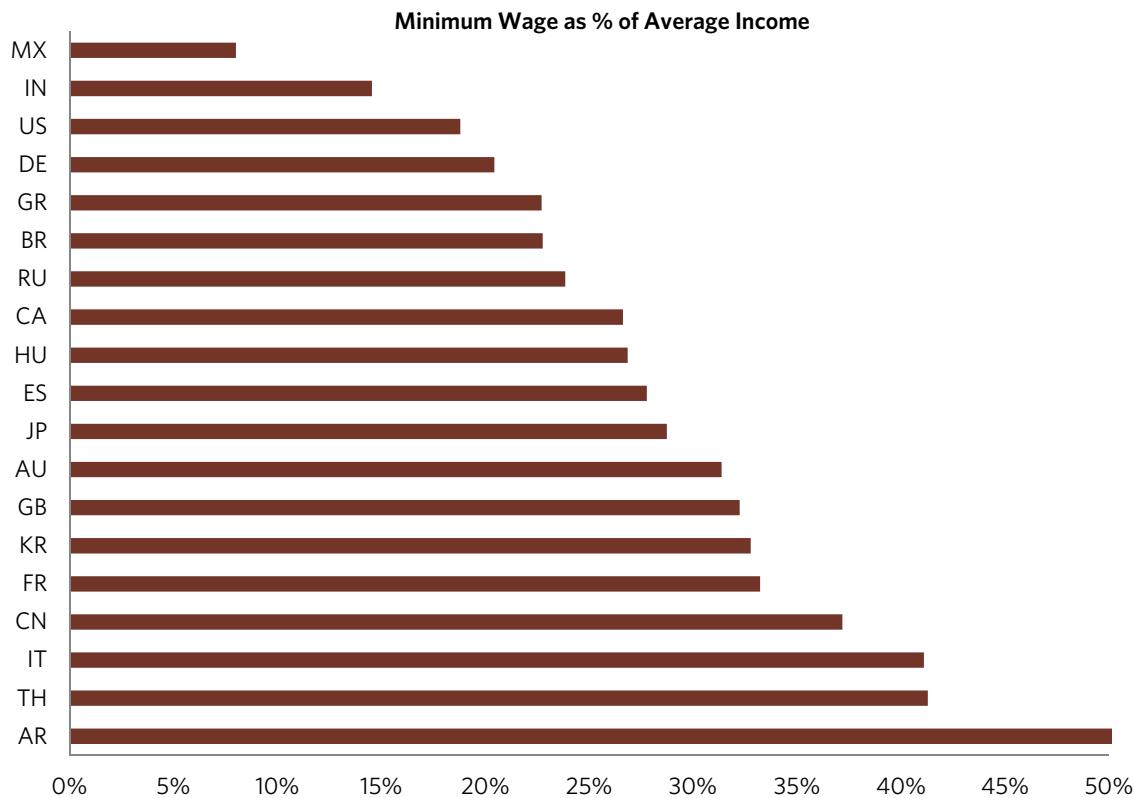
## Self-Sufficiency Subcomponent: Labor Market Rigidity - Ease of Hiring and Firing

Government protections that make it harder to hire or fire someone both increase the rigidity in the labor market and reduce the self-sufficiency of its workers. Looking at ease of hiring/firing, the US and Singapore rate as some of the most self-sufficient developed countries, and among the most self-sufficient of any country on this measure. China is not far behind, still in the top quartile. Protections against firing appear to be high in Europe, though Spain has made great strides in improving labor market flexibility through reforms over the last couple years. Protections against firing also appear high in Latin America—Argentina, Brazil and Mexico are all in the lower half.



## Self-Sufficiency Subcomponent: Labor Market Rigidity – Minimum Wage as Percentage of Average Income

The minimum wage of a country is another indication of its labor market rigidity and emphasis on supports versus market-based incentives and self-reliance. As with unionization rates, we again see quite a bit of difference across countries even within the same income group. Mexico tops the list, with the US and Germany not far behind. On the other end we see both developed countries, like Italy, and lower-income ones, like China and Argentina, that have much higher minimum wages as a percentage of incomes.



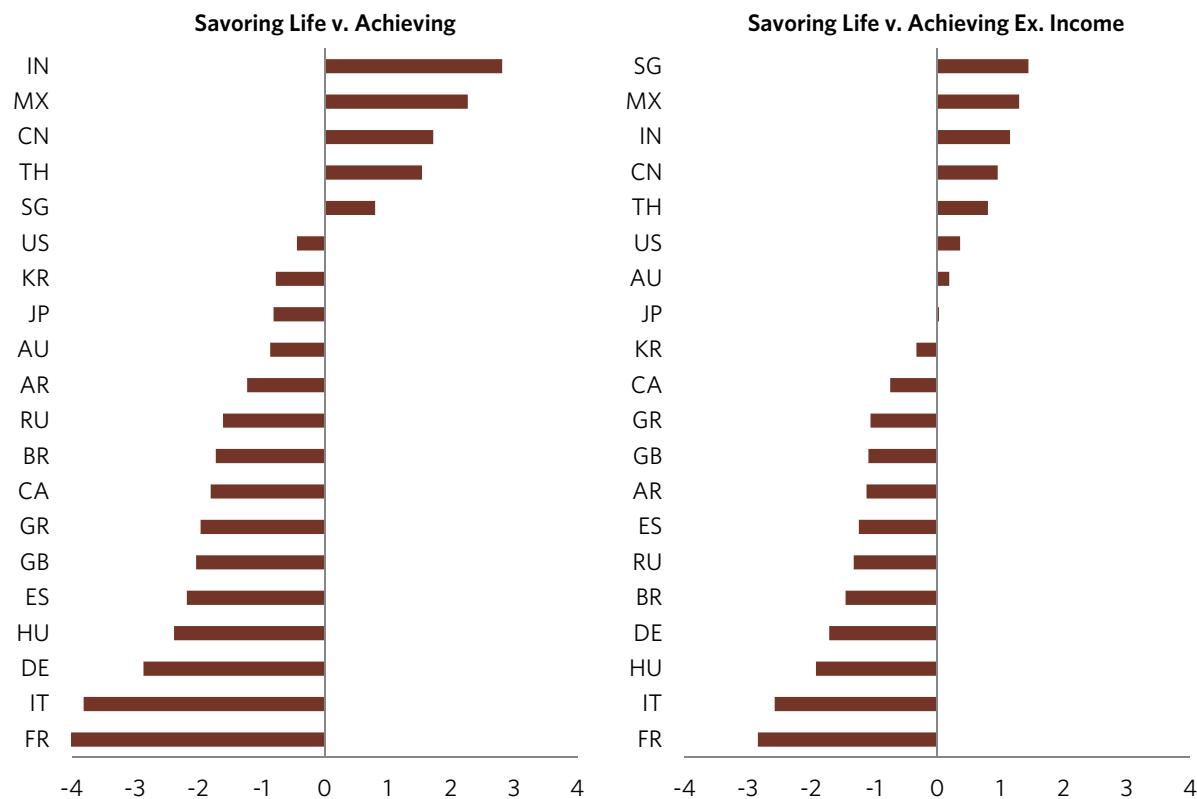
## Savoring Life Versus Achieving

It makes intuitive sense to us that those who value achievement over savoring the fruits of life will be more successful in finding ways to work harder and smarter to become more prosperous. Of course achievement means different things to different people. When I talk about a society that values achievement I imagine one where its people prioritize professional success, creating thriving businesses and building economic security versus other goals like protecting the environment or enjoying leisure. What's more, these societies tend to be ones where there is a faith that competition is fair and hard work will be rewarded (otherwise it's less likely for the people to be motivated).

To calculate our "savoring life versus achieving" gauge we put 50% weight on the measures of whether the culture values working hard and 50% on the values expressed in an international values survey. For the first component (the evidence we see of work ethic in things like hours worked or vacation days), we draw on the broad measure of working hard that we discussed as part of self-sufficiency. For the latter component, the expressed values of society, survey data is difficult to compare across countries, so we triangulated with several different questions that were consistent with our goal of capturing the desire of people to savor what they have or focus on achieving more. For example, we used answers to questions like, "what should the first priority be for the future of the country," or "economic growth is more important than the environment," to get at how people value further success or economic growth in relation to other values (like the environment, people having more say in their communities, etc.). We also look at questions about whether having a good time is important relative to accomplishing and whether the respondent thinks it's important to be successful, which are somewhat more direct. Lastly, questions like "competition is harmful" help us get a sense of people's attitudes toward the type of environment that encourages people to push to achieve. These were combined into our overall indicator of the relative preference for savoring life versus achieving in a way that is indicated by the weights shown below. As with self-sufficiency, there is a natural tendency for people in less developed countries to value becoming more prosperous through hard work and achievement, compared to developed countries which are more inclined towards leisure. Once we take into account the level of a country's income, our indicator of savoring life versus achieving is about 40% correlated to growth.

| Savoring Life vs. Achieving  | Correlation to Growth | Weight |
|--|-----------------------|--------|
| <b>Aggregate Ex. Income Effect</b>   | 40%                   | 100%   |
| <b>Aggregate</b>   | 60%                   | ---    |
| <b>Observed Outcomes</b>   | 49%                   | 50%    |
| Work Ethic   | 49%                   | 50%    |
| <b>Expressed Values</b>  | 59%                   | 50%    |
| Priority for future of country: economic growth v. having more say, defense, or making cities and countryside more beautiful | 58%                   | 7.1%   |
| Hard work leads to success   | 26%                   | 7.1%   |
| Competition is harmful   | 23%                   | 7.1%   |
| It is important to this person to have a good time   | 25%                   | 7.1%   |
| It is important to this person to be very successful   | 42%                   | 7.1%   |
| Important Child Qualities: Feeling of Responsibility   | 42%                   | 7.1%   |
| Economic growth is more important than the environment   | 8%                    | 7.1%   |

When we look at the picture of which countries prioritize achievement over savoring, we see the familiar countries at the top and bottom—East Asia and the European periphery, respectively. India and Mexico score as being most focused on achieving. The most achievement-oriented countries in the developed world are the US and Japan by these measures. European countries focus more on savoring life than most countries in the world, with France and Italy at the bottom. The positions change some once we take into account the effect of income, though not all that much (the differences between the extremes are also smaller). Singapore moves up to the top spot—when you take into account how wealthy the country is, it's remarkable how hard-working and achievement-oriented its people appear by our measures. India still ranks toward the top after taking into account its income level, but its relative achievement orientation stands out as less exceptional.

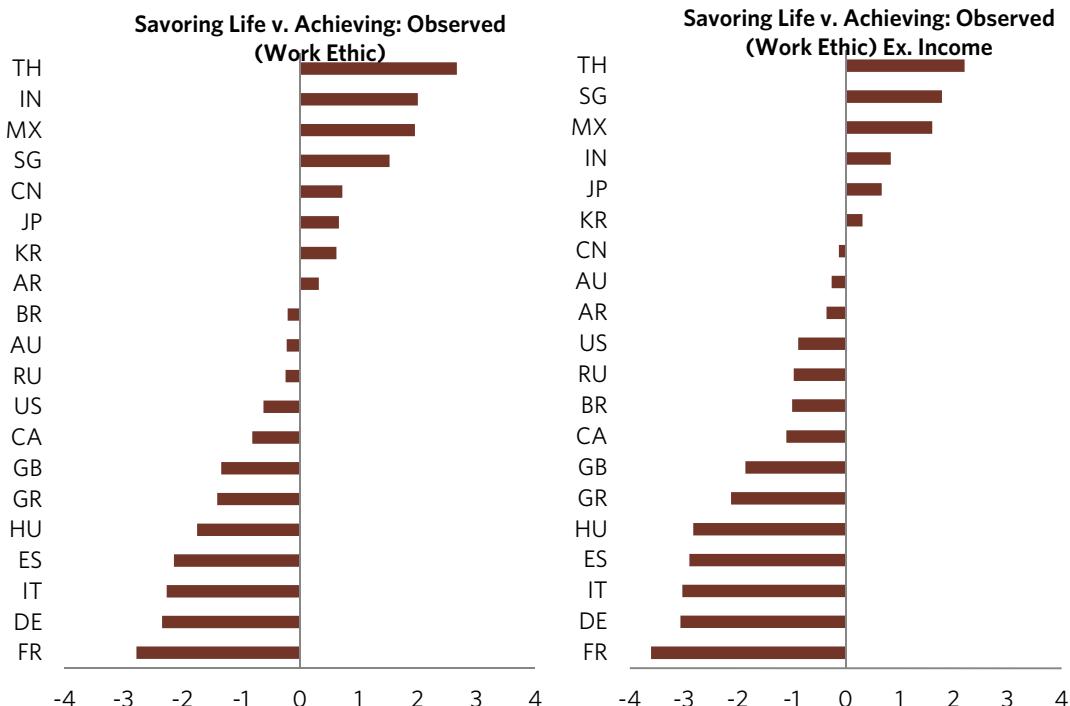


## Savoring Life Versus Achieving Subcomponents: Observed Outcomes

One straightforward way to see whether a society values achieving over leisure is to observe the outcomes of its choices: literally how much effort they put into work. A society whose people strive hard to achieve in a market-based system will likely have a more vibrant, competitive business environment. These traits will make it more likely to improve its potential than an economy which chooses to value the fruits of life instead. Often we will see countries that have acquired great wealth and become rich begin to make this choice.

For the observed piece of the concept of savoring life versus achieving, we use our broad measure of how hard-working a country is. (As discussed, this is the same broad measure we use as part of self-sufficiency, so if it is fresh in your mind you can skip down to the expressed values of this indicator.) As a reminder, this measure includes a broad set of indications of a country's work ethic, including not just the average hours worked, but also measures like the typical retirement age, how many vacation days people in each country typically take, and male labor force participation on its own. Again, regrettably we must look at our hours worked and labor force measures for just men because different social norms across countries around women in the workforce distort the numbers. Since we expect richer countries to take more leisure than poorer ones, this is one of the measures we expect to have a fairly strong relationship with a country's income level.

When we scan across countries, we see emerging countries at the top of the list, including India and Mexico. Overall, emerging Asia comes through as working the hardest, followed by Latin America. Among rich countries, Singapore and then Japan have the hardest workers. The US is fairly hard-working among developed countries, whereas workers in Europe appear to opt for leisure more than anyone else based on these measures. Once we take into account the tendency for wealthier countries to take more leisure time, Japan really stands out as exceptionally hard-working (as do Korea and Singapore). Argentina and Brazil move down a bit. Still, the relative ordering of most countries is fairly stable, since the differences in how hard each country works are fairly extreme. Any way you cut it, Mexico and India remain among the hardest-working countries and workers in Europe some of the most leisure-taking.



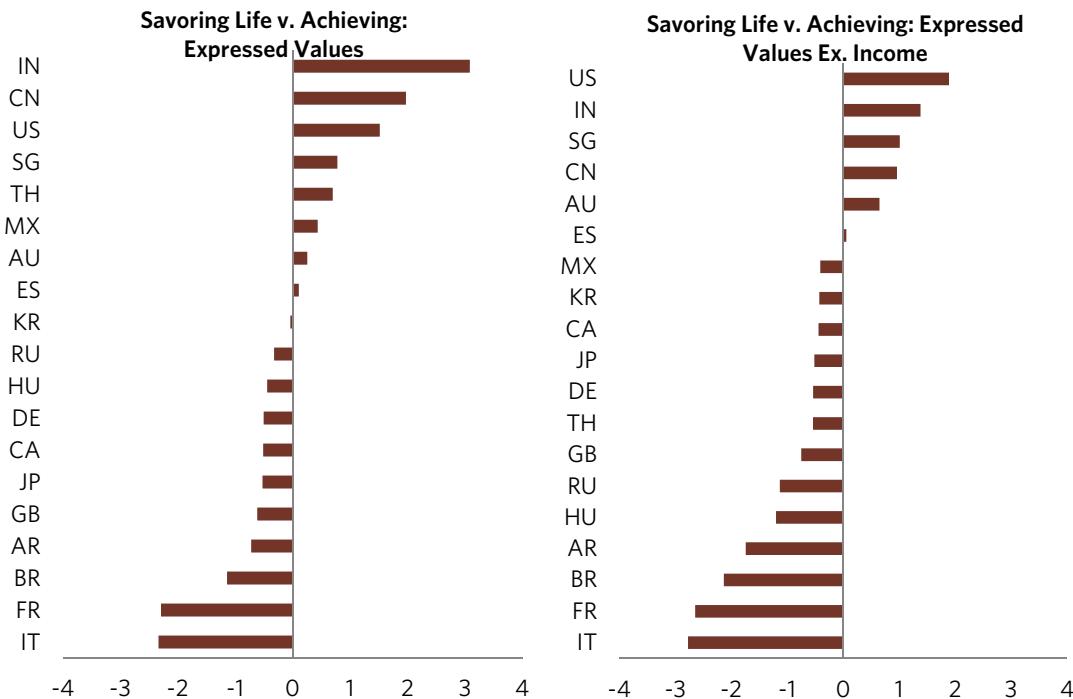
Below we show the individual pieces of our hard-working gauge. Please see the discussion of the hard-working gauge within the self-sufficiency section for a more detailed look at each individual piece.

| Work Ethic Measures                                  | TH  | IN  | MX  | SG  | CN  | JP  | KR  | AR  | BR  | AU  | RU  | US  | CA  | GB  | GR  | HU  | ES  | IT  | DE  | FR  |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Avg. Actual Hours Worked (Hrs/wk)                    | 40  | 37  | 35  | 35  | 35  | 31  | 29  | 29  | 28  | 27  | 25  | 24  | 24  | 23  | 25  | 21  | 20  | 20  | 18  | 17  |
| Male Reported Avg. Hours Worked (ex Vacation)        | 51  | 47  | 46  | 46  | 47  | 45  | 41  | 44  | 38  | 39  | 38  | 37  | 36  | 37  | 43  | 37  | 34  | 36  | 30  | 31  |
| Labor Force Participation (% Working Age Population) | 81% | 81% | 80% | 78% | 78% | 70% | 72% | 75% | 81% | 72% | 71% | 70% | 71% | 69% | 63% | 60% | 67% | 59% | 66% | 62% |
| Effective Retirement Age (% of Life Expectancy)      | --- | 92% | 98% | --- | 72% | 88% | 94% | 91% | 78% | 82% | 93% | 87% | 81% | 82% | 80% | 87% | 79% | 79% | 81% | 77% |
| Actual Vacation+Holidays Per Year (Weeks)            | --- | 2.3 | 1.9 | 2.0 | 2.6 | 1.0 | 1.6 | --- | 4.3 | 2.3 | 3.8 | 3.3 | 3.6 | 6.5 | 5.9 | 5.5 | 6.8 | 5.9 | 7.0 | 7.0 |

## Savoring Life Versus Achieving Subcomponent: Expressed Values

Observing the outcomes of people's choices is one way to see whether they value achievement over savoring; another, of course, is to ask them. You can imagine the questions you would ask. Some of the ones that are intuitive to us are whether a society puts growth as a top priority for the country, whether it believes competition is healthy and at a personal level whether each individual feels being very successful is important and that hard work will lead to success. Fortunately, there is a World Values Survey that asks many questions and includes ones like this. Naturally there are challenges comparing survey data across countries, but we believe by triangulation across a set of intuitive questions we can come up with a pretty good indication of a country's expressed values, which we can then weigh against the outcomes we observe (which form the other half of our savoring life versus achieving gauge, as discussed above).

In fact, the rankings for the expressed component show a similar picture as those we observe in measures of work effort. India and China top this gauge for the emerging world, and Latin America is further down the list. Of the developed world, the US values achieving most, while France and the European periphery place the most emphasis on savoring life. This gauge is less correlated with incomes than observed measures of work effort, which makes some sense as observed measures are a more direct way of seeing a country's values (e.g., you can value savoring the fruits of life but work out of necessity). When you exclude the effect of income, the US moves to the top of achievement-oriented countries, with India just behind.



The table below shows more specific information which we triangulated to get a sense of the expressed values toward achievement versus savoring in a given society. It's interesting how the reasons for these cultural attitudes differ across countries. For example, in Russia people express a lack of faith that hard work leads to success, even though they express a desire for the country to grow, while in Canada people express a high value on political input or environmental protection over economic growth. That said, we don't want to make too much of any one of these indications, since what we are trying to capture is the overall essence of whether a country is achievement-oriented.

| Savoring Life vs. Achieving -- Expressed Values   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Country   | IN   | CN   | US   | SG   | TH   | MX   | AU   | ES   | KR   | RU   | HU   | DE   | CA   | JP   | GB   | AR   | BR   | FR   | IT   |
| For future of country, value of having more say v. economic growth, defense, and making cities and countryside more beautiful | 0.7  | 1.0  | 0.3  | 0.2  | 0.9  | -0.7 | -1.0 | -0.7 | -0.5 | 0.5  | 0.2  | -1.2 | -1.5 | -0.3 | -1.7 | -0.4 | -0.4 | -1.6 | -1.0 |
| Hard work leads to success  | 1.0  | 0.7  | 0.5  | -0.2 | -1.0 | 1.1  | 0.2  | 0.0  | 0.1  | -1.3 | -0.9 | -0.5 | 0.3  | -0.7 | -0.3 | -0.7 | -0.5 | -1.3 | -1.2 |
| Competition is harmful  | 1.7  | 0.4  | 0.5  | -1.0 | -1.5 | 0.6  | 0.4  | -0.4 | -0.2 | -0.7 | -0.8 | -0.3 | 0.0  | -0.7 | -0.6 | -1.4 | -0.6 | -2.0 | -1.0 |
| It is important to this person to have a good time  | 0.4  | 1.0  | 1.0  | 0.0  | 0.2  | -1.0 | 1.0  | -0.4 | -0.1 | -0.3 | -0.8 | -0.5 | 0.3  | 1.3  | 0.4  | 1.0  | -0.9 | -1.0 | ---  |
| It is important to this person to be very successful  | 1.6  | 0.0  | -1.0 | -0.1 | -0.2 | 0.2  | -1.3 | -0.5 | -0.2 | 0.1  | -0.3 | -0.1 | -0.6 | -1.5 | -1.2 | -0.9 | -0.7 | -0.7 | ---  |
| Economic growth is more important than the environment  | -0.4 | -1.0 | 0.2  | 1.0  | 0.6  | -0.7 | -0.6 | 0.1  | 0.2  | -0.2 | 0.2  | 0.5  | -1.5 | 0.0  | -0.7 | -1.2 | -1.0 | -0.2 | -0.9 |

## Innovation and Commercialism

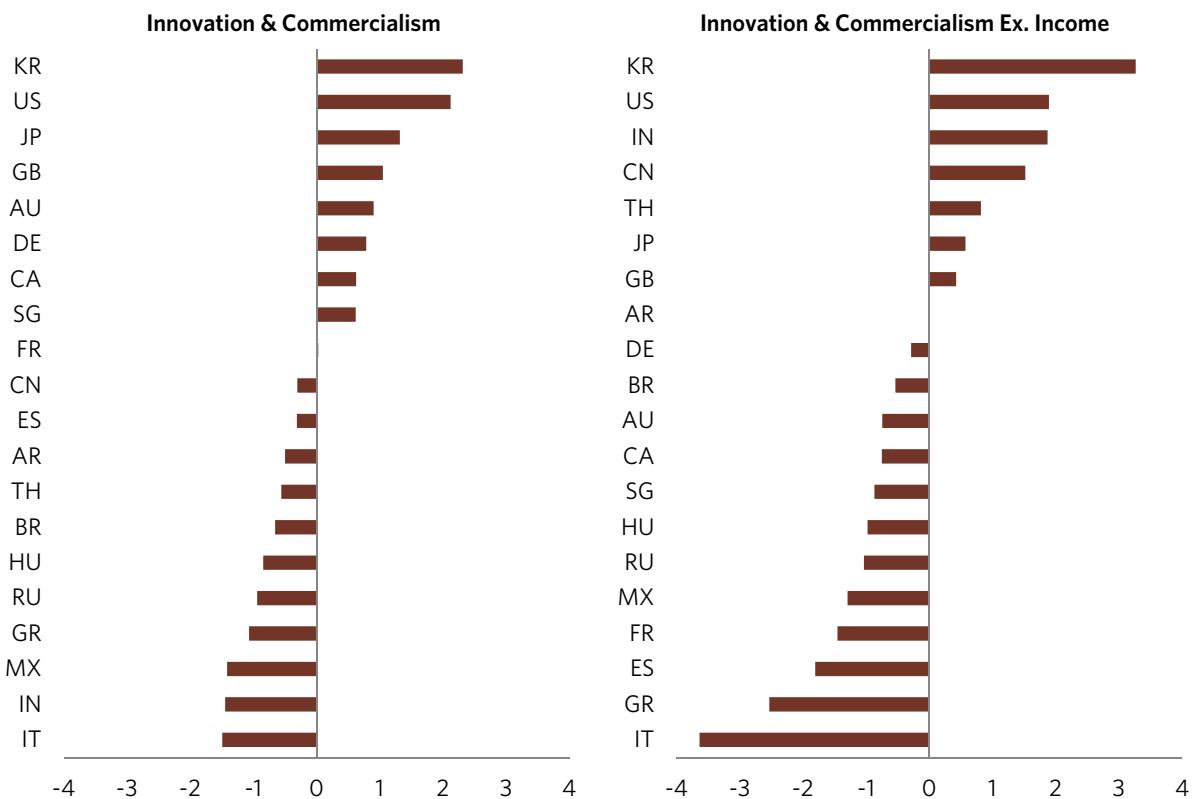
An innovative and commercial spirit is the lifeblood of a thriving economy. The drive to tinker and invent, to discover, to improve from prior failures—this is how people learn and find new and better ways of creating things of value. In a market-based system, the most powerful way to drive innovation is to bring new ideas to market, to commercialize and profit from them. The marketplace is generally efficient in weeding out the good ideas from the bad and pricing what innovations are most valued by society. In this way the concepts of innovation and commercialism go hand in hand. They capture whether people in a society value finding new knowledge or creating new things, and whether their incentives are aligned to encourage them to seek a profit by commercializing these ideas. The following statistics measure the level of innovation and commercialism in different countries and their correlations with future growth.

We looked at a variety of measures to triangulate these concepts. For both scientific and commercial innovation, we wanted to have a balance between indicators that captured *outputs* (new inventions or businesses), and indicators that measured *inputs* (values, investment, and people) that we thought would logically lead to innovation. We weigh the inputs and outputs equally. The pieces of our innovation and commercialism indicator are shown in the following table. Overall, the raw indications of innovation and commercialism are stronger in higher-income countries, especially measures of investment (like R&D expenditure) that require a certain level of resources, or measures of knowledge creation (like patent creation) that require a level of acquired knowledge. What we are focused on with our culture measures, however, are the underlying values of a society independent of its wealth and development stage (which we proxy in a simple way with income levels). Once we exclude the effect of income, our gauge of innovation and commercialism is 49% correlated to historical future growth in income per capita. It's notable that before this adjustment there is no relationship between a country's future growth and the level of observed innovation and commercialism.

| Innovation & Commercialism          | Correlation to Growth | Weight      |
|-------------------------------------|-----------------------|-------------|
| <b>Aggregate Ex. Income Effect</b>  | <b>49%</b>            | <b>100%</b> |
| <b>Aggregate</b>                    | <b>5%</b>             | <b>---</b>  |
| <b>Outputs</b>                      | <b>-11%</b>           | <b>50%</b>  |
| # New Patents                       | 18%                   | 12.5%       |
| Royalty and license fees, payments  | -17%                  | 12.5%       |
| # New Businesses                    | -9%                   | 6.3%        |
| % of People Creating New Businesses | 29%                   | 6.3%        |
| # New Major Websites                | -35%                  | 6.3%        |
| New Trademark Creation              | -30%                  | 6.3%        |
| <b>Inputs</b>                       | <b>21%</b>            | <b>50%</b>  |
| Gross expenditure on R&D            | 3%                    | 12.5%       |
| Researchers                         | -14%                  | 12.5%       |
| Fear of Business Failure            | 11%                   | 12.5%       |
| Entrepreneurship Prevalence         | 30%                   | 12.5%       |

On the next page we show our current measures for the aggregate indicator with and without the effect of income, as well as for the components of our indicator. Where applicable we look at each measure that goes into these gauges relative to the number of people in the society or the size of the economy.

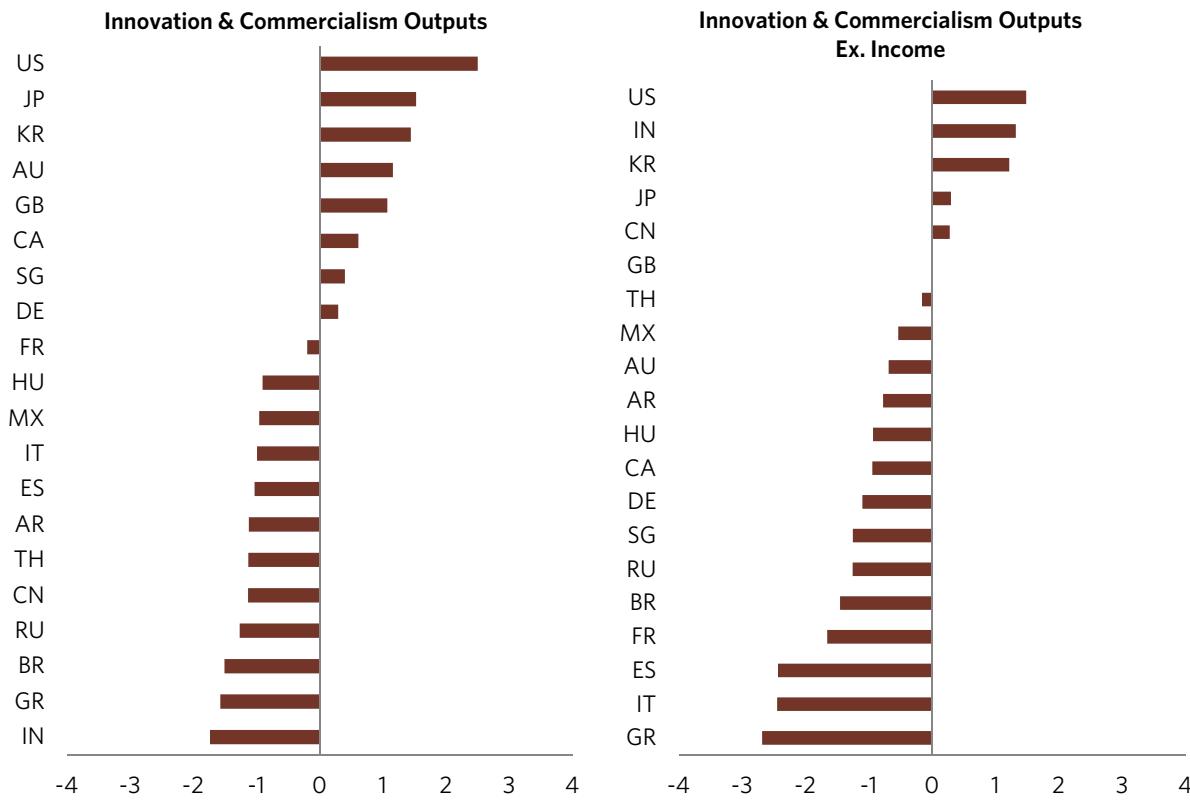
In terms of our ratings of countries on this gauge, Korea and the US rank as being the most innovative and commercial-minded both on an absolute basis and after we take out the effect of income. Korea invests a lot of capital and people toward research and has reaped the rewards in the form of a high number of new patents and royalties. Along with relatively high investment in research, Americans stand out as highly entrepreneurial. Germany and Japan aren't far behind, each investing high amounts of R&D and researchers into the innovation process and seeing the benefits from things like new patents, businesses, and websites. China is roughly neutral on our measures on an absolute basis, but it jumps to the top third once you take into account the fact that its proportion of people creating new businesses and gross expenditure in R&D are fairly high given how poor it still is. India is less innovative but it's much poorer, so it moves ahead of China once you adjust for the effect of income. Latin America and emerging Europe score in the middle to bottom end of the range whether you adjust for the effect of income or not, especially Russia and Mexico. Once you adjust for income, Europe's periphery fares poorly, particularly Italy, which is at the bottom of the list. Mostly, their innovation and commercial *inputs* like researchers or entrepreneurship prevalence are moderate, but those aren't leading to the scientific or business *outputs* you'd expect for countries at their income level.



## Innovation and Commercialism Subcomponent: Outputs

We would expect a country that has more innovative and commercially minded people to create more patents and trademarks, more businesses—in other words, that it is actively creating new ideas, protecting its intellectual property and capturing the rewards of this innovation. So we look at these outcomes as one way to get a sense of the society's innovative and commercial spirit. Some outcomes are more directly indicative of innovation (like patent creation), others more direct signs of commercialism (like new businesses created or the prevalence of entrepreneurs), and some show the signs of combining the two (like royalty fees).

When we look at these measures on their own, they are fairly related to a country's income, which is intuitive since rich countries tend to have more resources to invest and have higher levels of education and accumulated knowledge, so are more likely to lead in creating innovations valued in the market. On the raw measures, you see many poor countries at the bottom, like India or China (that might have a strong innovative spirit but you wouldn't expect to be leading innovators right now) behind rich countries, like France or Italy, that may actually have less drive to find new ideas and build businesses. But when we adjust for income, both India and China move up a lot, especially India, which appears just as innovative and commercial as the US when you account for its stage of development. Either way you look at it, the US tops our scores for the outputs of innovation and commercialism. After taking out the effect of income, rich countries like the US and Japan still stand out as highly innovative. The European periphery countries (Greece, Spain and Italy) have the worst scores once you adjust for how few new commercial innovations they're producing in light of how rich they are. France, Brazil, and Russia are just behind.



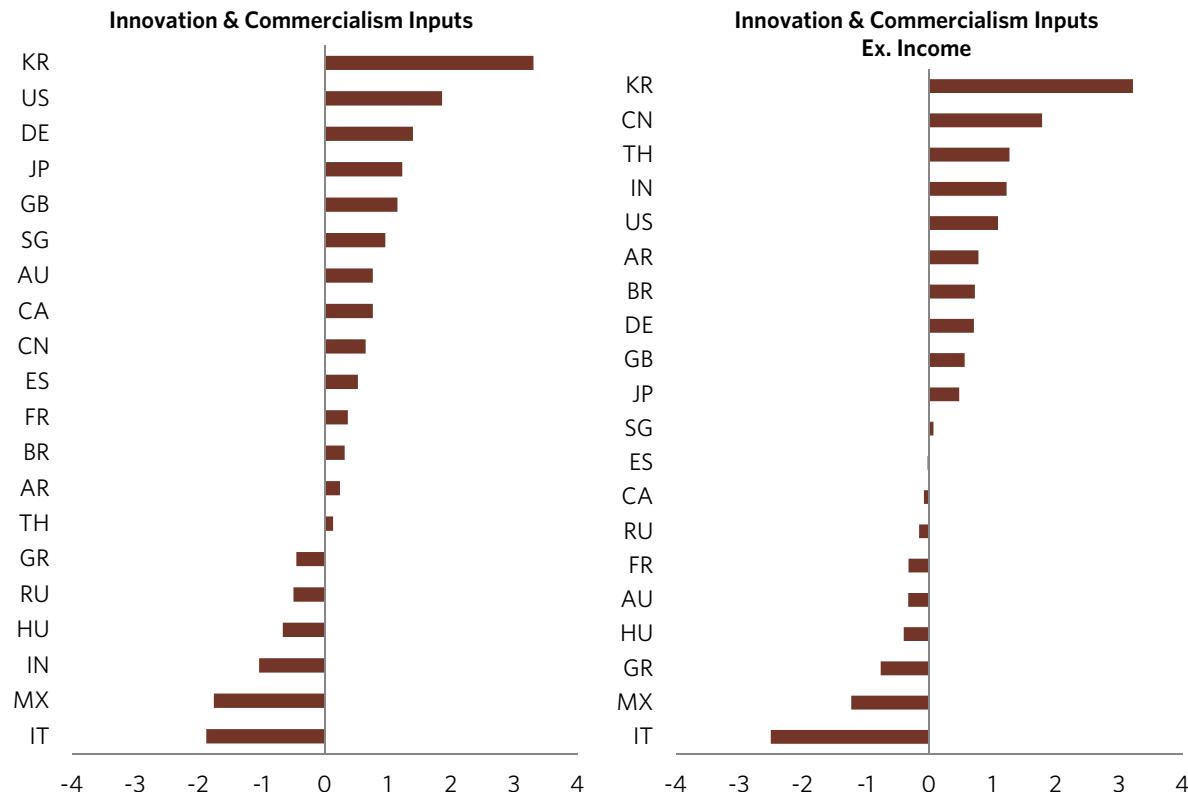
Below you can see a more granular view of how each country scored for each measure.

| Innovation & Commercialism Outputs                  |  | US  | JP    | KR    | AU  | GB  | CA  | SG  | DE  | FR  | HU   | MX   | IT  | ES   | AR   | TH  | CN   | RU   | BR   | GR   | IN   |
|---|--|-----|-------|-------|-----|-----|-----|-----|-----|-----|------|------|-----|------|------|-----|------|------|------|------|------|
| Country   |  |     |       |       |     |     |     |     |     |     |      |      |     |      |      |     |      |      |      |      |      |
| # New Patents (per mln persons)                     |  | 844 | 2,246 | 3,022 | 113 | 243 | 135 | 205 | 562 | 228 | 70   | 10   | 140 | 71   | 18   | 15  | 389  | 200  | 25   | 56   | 8    |
| # New Businesses (per thous. Person)                |  | --- | 1     | 2     | 12  | 11  | 1   | 8   | 1   | 3   | 5    | 1    | 2   | 3    | 1    | 1   | ---  | 4    | 2    | 1    | 0    |
| # New Major Websites (per thous. Persons), Index    |  | 100 | 20    | 10    | 84  | 76  | 93  | 33  | 66  | 49  | 13   | 3    | 25  | 31   | 4    | 7   | 2    | 4    | 2    | 14   | 1    |
| % of People Creating New Businesses                 |  | 9   | 2     | 3     | 6   | 4   | 8   | 6   | 3   | 3   | 6    | 12   | 2   | 3    | 11   | 8   | 5    | 3    | 5    | 3    | 5    |
| New Trademark Creation (Z - Score)                  |  | 1.8 | 0.0   | 0.1   | 1.3 | 1.1 | 1.8 | --- | 1.2 | 0.9 | -0.9 | -0.8 | 0.4 | -0.3 | -0.8 | --- | -1.0 | -1.1 | -1.0 | -0.9 | -1.0 |
| Royalty and license fees, payments Ann. (\$)/Person |  | 102 | 35    | 10    | 7   | 69  | 15  | 69  | 24  | 56  | 21   | 0    | 10  | 9    | 1    | 1   | 0    | 0    | 0    | 3    | 0    |

## Innovation and Commercialism Subcomponent: Inputs

Ultimately what matters for commercial innovation is whether there is a strong spirit of finding new things and building new businesses in the society. Whether a country is investing its resources in new innovations and whether it has a culture of risk-taking are good signs this spirit is strong. So to measure the inputs to innovation we look at human and capital investment through R&D expenditure as a percentage of GDP and the proportion of researchers in the population. We look at entrepreneurial spirit by examining whether people express a fear of failing in a new business endeavor in surveys and whether there is a prevalence of entrepreneurs in the population.

As with the outputs of innovation, the innovation inputs we measure are highly correlated to income, again to be expected since richer countries have more resources and higher levels of education to devote to finding new ideas. To account for this and get at the underlying spirit of innovation and commercialism we simply take out the effect of income. Here again we see India and China behind many rich countries on our raw indicators, and then at the top of the list after taking into account their level of income; on the other hand, certain rich countries are at the bottom of the list after excluding the effect of income—for example, Italy and France. As observed when we looked at its score on our outcomes measure, Korea has the highest score for inputs to innovation and commercialism. That's because it devotes a high amount of spending and people to research while also having a healthy amount of entrepreneurship (despite some apparent fear of business failure). Within the developed world, the US, Germany and Japan stand out as the countries most oriented toward innovation and commercialism, near the top of all countries. Japan stands out because of the resources it devotes—its level of researchers relative to its population and R&D expenditure—which outweigh an apparent fear of business failure. The US, on the other hand, is strong on all measures, with a healthy willingness to take risk.



Below you can see a more granular view of how each country scored for each measure.

| Country                                    | KR    | US    | DE    | JP    | GB    | SG    | AU    | CA    | CN    | ES    | FR    | BR    | AR    | TH   | GR    | RU    | HU    | IN   | MX  | IT    |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|------|-----|-------|
| Gross expenditure on R&D (%GDP)            | 4.4   | 2.8   | 2.9   | 3.3   | 1.7   | 2.2   | 2.4   | 1.7   | 2.0   | 1.3   | 2.3   | 1.2   | 0.6   | 0.3  | 0.7   | 1.1   | 1.3   | 0.8  | 0.4 | 1.3   |
| Researchers (per mln persons)              | 7,699 | 4,663 | 6,280 | 7,011 | 6,872 | 7,321 | 4,224 | 4,260 | 1,393 | 4,735 | 5,328 | 1,203 | 1,942 | 581  | 4,069 | 2,603 | 3,696 | 137  | 386 | 2,496 |
| Fear of Business Failure (Z - Score)       | -1.1  | 0.6   | -0.6  | -2.2  | -0.2  | -0.8  | -1.3  | 0.0   | 0.2   | -0.2  | -1.0  | -0.6  | 1.6   | -2.2 | -2.2  | 1.0   | -1.6  | -0.6 | 0.5 | -2.2  |
| Entrepreneurship Prevalance (% population) | 9%    | 8%    | 5%    | 6%    | 7%    | 4%    | 9%    | 8%    | 11%   | 8%    | 4%    | 15%   | 10%   | 28%  | 13%   | 3%    | 7%    | 11%  | 4%  | 4%    |

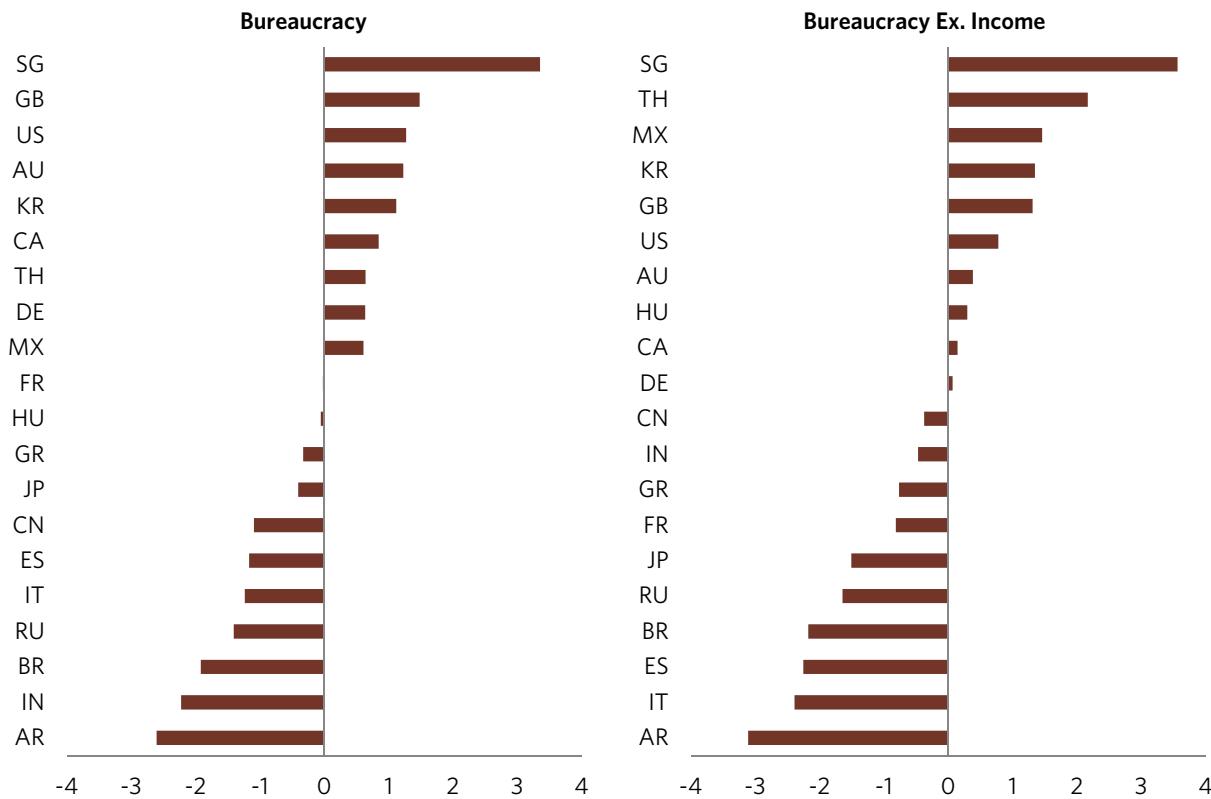
## Bureaucracy

Lots of red tape and government regulation stymie business activity. They impact the core elements of a thriving economy by hindering people from innovating or creating new businesses, and they make running a business burdensome, requiring people to spend time complying with unnecessary or heavy administrative controls instead of focusing on business improvements. That's not to say that regulation is not important—of course good governance and the rule of law are critical to a healthy market-based economy, as we will examine next. But excessive, time-consuming and rigid controls gum up the wheels of the economy.

To measure bureaucracy we look at measures related to the ease of starting a business (from the World Bank/IFC), the efficiency and cost of dealing with construction permits (also World Bank/IFC) and the burden of government regulation (from the World Economic Forum). The pieces of our bureaucracy indicator are shown in the table below. Bureaucracy tends to be more prevalent in less developed countries and so is fairly related to income levels. This is fairly natural for a number of reasons, because the processes are simply less efficient and require more steps, because the market systems are less advanced or established and have more controls, or because of inter-related factors, like weaker rule of law and a higher degree of corruption leading to more controls that allow for rent seeking. From a growth perspective, businessmen and investors will likely accept that a certain degree of bureaucracy is to be expected to do business in an emerging country that is otherwise competitive. But if the bureaucracy is exceptional even relative to countries of similar income, it is no doubt going to weigh on the decision to do business in that country. Once excluding the effect of income, our gauge of bureaucracy is 32% correlated to historical future growth in income per capita. Notably, it is negatively correlated to future growth when we don't make this adjustment. Along with our measures of the rule of law and corruption, this gauge helps us triangulate the picture of how hard it is to do business in a country.

| Bureaucracy                        | Correlation to |        |
|------------------------------------|----------------|--------|
|                                    | Growth         | Weight |
| <b>Aggregate Ex. Income Effect</b> | 32%            | ---    |
| <b>Aggregate</b>                   | -14%           | 100%   |
| Starting a Business                | -28%           | 33%    |
| Dealing with Construction Permits  | -24%           | 33%    |
| Burden of government regulation    | 44%            | 33%    |

Before taking into account income levels, Singapore ranks best on our gauge of bureaucracy, followed by the English-speaking developed world. Nowhere is it easier to start a business or run one without burden from government regulation than in Singapore according to our measures. Bureaucracy is worst in Argentina and India and high in Russia, Brazil and China as well. Once you exclude the relationship between income and bureaucracy, India and China don't look quite as bad, though still below par. Europe's periphery (Spain, Greece, and Italy) all look highly bureaucratic given their stage of development. Italy ranks near the bottom due in particular to the burden government regulations place on doing business. Russia scores poorly considering its income, just a touch above Argentina.



Below you can see a more granular view of how each country scored for each measure.

| Bureaucracy                       | SG  | GB  | US  | AU   | KR  | CA   | TH   | DE   | MX   | FR   | HU   | GR   | JP   | CN   | ES   | IT   | RU   | BR   | IN   | AR |
|-----------------------------------|-----|-----|-----|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----|
| Country                           |     |     |     |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |    |
| Starting a Business               | 2.4 | 1.7 | 1.9 | 2.4  | 1.5 | 2.5  | -0.4 | -1.1 | 1.0  | 1.3  | 0.6  | 0.7  | -1.4 | -2.7 | -2.1 | -0.4 | -1.5 | -3.4 | -2.8 |    |
| Dealing with Construction Permits | 2.0 | 1.3 | 1.1 | 1.8  | 1.6 | -1.3 | 1.7  | 1.8  | 0.9  | -0.5 | 0.7  | 0.2  | -0.5 | -3.4 | -0.8 | -1.2 | -3.2 | -1.8 | -3.3 |    |
| Burden of government regulation   | 4.0 | 1.5 | 0.8 | -0.5 | 0.3 | 1.3  | 0.7  | 1.3  | -0.1 | -0.8 | -1.5 | -1.9 | 0.7  | 2.8  | -0.6 | -2.1 | -0.6 | -2.5 | 0.0  |    |

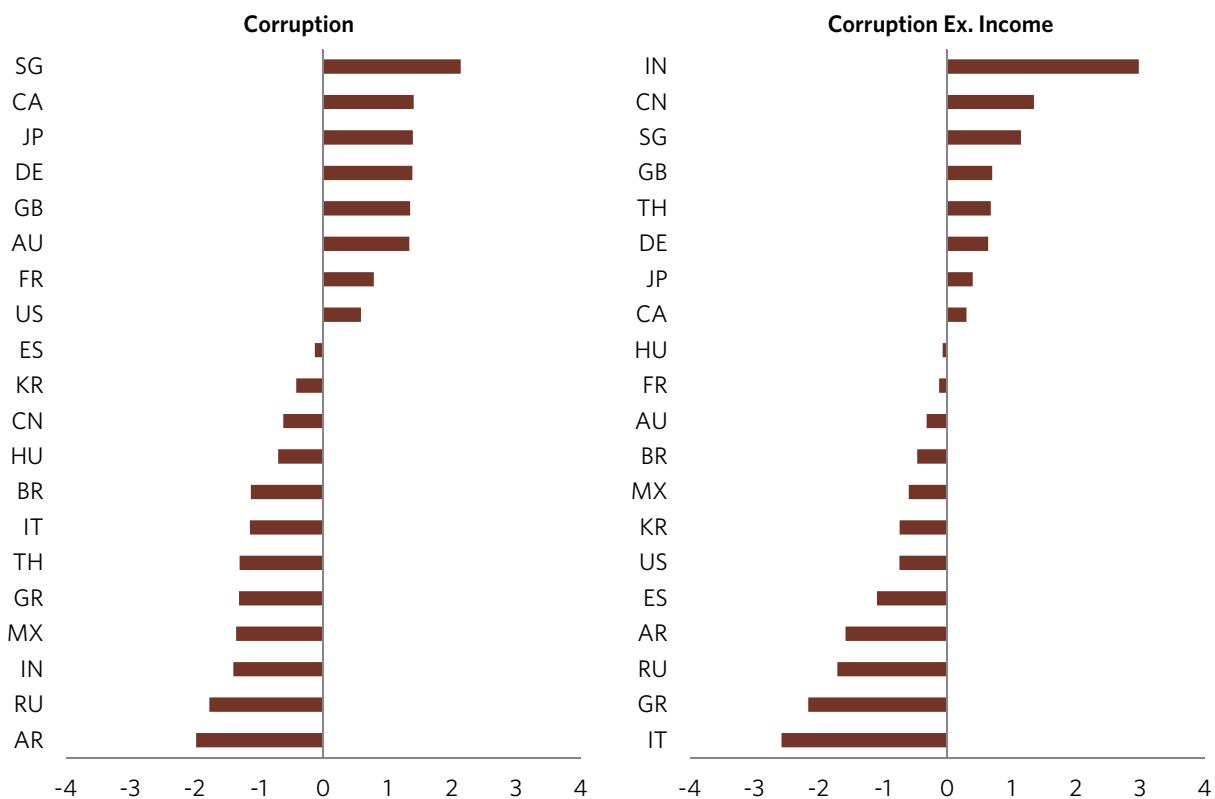
## Corruption

Corruption undermines the effectiveness of a market-based system in a variety of ways, diverting resources, distorting incentives, raising the costs of doing business, undermining business competition and efficiency, and creating uncertainty for investment. Corruption also both discourages profit-seeking and often impedes it. Small types of corruption (like the bribes one may have to pay at the airport or to an administrative official) create inefficiencies that slow down the agility of businesses, raise costs and make it more difficult to cultivate a new business. Big forms of corruption (for example, business appropriation) create limits to financial success and others (like large bribes to enter an industry or win a license) create entry barriers and lower prospective returns. All forms can make a country's system dysfunctional and create uncertainty around doing business in a given country. In all these ways corruption undermines productivity and the capacity of a society to realize its potential.

To measure corruption, we combine Transparency International's measures of corruption across countries with three sub-indices from the World Economic Forum's competitiveness index: "diversion of public funds," "irregular payments and bribes," and "favoritism in decisions of government officials." These measures help us capture the different types of corruption (big and small). The pieces of our corruption indicator are shown in the table below. When we look at these measures we see that poorer countries tend to have higher degrees of corruption. That's for a number of reasons we won't explore in depth here, including fewer opportunities for wealth creation, entrenched ways of operating that may have once been part of a different, non-market based system, or weaker rule of law. Businessmen and investors will likely put up with a certain degree of corruption to operate in an emerging country that is otherwise competitive. But if that country has an exceptionally high degree of corruption relative to countries of similar income, it is no doubt going to weigh on the decision to do business in that country. Once excluding the effect of income, our gauge of corruption is 58% correlated to historical future growth in income per capita. Notably, the relationship is slightly negative without this adjustment. Along with our measures of bureaucracy and the rule of law, this gauge helps us triangulate the picture of how hard it is to do business in a country.

| Corruption                                      | Correlation to |             |
|---|----------------|-------------|
|   | Growth         | Weight      |
| <b>Aggregate Ex. Income Effect</b>              | <b>58%</b>     | ---         |
| <b>Aggregate</b>                                | <b>-7%</b>     | <b>100%</b> |
| Transparency Int'l Corruption Index             | -28%           | 25%         |
| Diversion of Public Funds                       | -4%            | 25%         |
| Irregular Payments and bribes                   | -17%           | 25%         |
| Favoritism in decisions of government officials | 10%            | 25%         |

Before taking into account the income level of countries, Singapore again looks best, with Japan, the English-speaking developed world, and Germany also near the top. Most emerging countries are toward the bottom of our rankings, which is to be expected given the relationship between corruption and income levels we have discussed. When we exclude how income levels are related to corruption, Latin American countries and the European periphery are at the bottom of our ratings. Italy and Greece stand out as having the highest degree of corruption of any of the countries we look at, followed by Russia and Argentina just behind. Italy is weak across all measures, especially given how wealthy it is, and particularly with regard to favoritism by government officials. India and China both face significant impediments from their levels of corruption. But when we consider their levels of corruption relative to their levels of income, their corruption is not exceptional; in fact, it's lower than we would expect. Even after considering income levels, many developed countries still rate high, Singapore in particular, but also commonwealth countries, Japan, and Germany. The US rates in the bottom third after considering its income.



Below you can see a more granular view of how each country scored for each measure.

| Country   | SG  | CA  | JP  | DE  | GB  | AU  | FR  | US   | ES   | KR   | CN   | HU   | BR   | IT   | TH   | GR   | MX   | IN   | RU   | AR   |
|---|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Transparency Int'l Corruption Index             | 1.9 | 1.6 | 1.1 | 1.4 | 1.2 | 1.6 | 0.9 | 1.1  | 0.2  | -0.1 | -1.0 | -0.1 | -0.9 | -0.8 | -1.3 | -1.1 | -1.4 | -1.3 | -1.8 | -1.4 |
| Diversion of Public Funds                       | 2.1 | 1.3 | 1.3 | 1.4 | 1.7 | 1.2 | 0.7 | 0.5  | -0.9 | -0.8 | -0.2 | -1.6 | -2.0 | -1.4 | -1.4 | -1.5 | -1.4 | -1.7 | -2.5 |      |
| Irregular payments and bribes                   | 2.2 | 1.3 | 1.7 | 1.2 | 1.5 | 1.2 | 0.8 | 0.1  | -0.1 | -0.6 | -1.1 | -0.6 | -1.2 | -1.2 | -1.4 | -1.6 | -1.5 | -2.0 | -2.1 | -2.5 |
| Favoritism in decisions of government officials | 2.9 | 1.1 | 1.9 | 1.6 | 1.2 | 0.8 | 0.5 | -0.3 | -0.5 | -0.9 | 0.7  | -1.5 | -0.9 | -1.7 | -1.0 | -1.5 | -0.9 | -1.1 | -1.5 | -2.7 |

## Rule of Law

A strong rule of law helps ensure fair competition in a market-based system and it protects the incentives and efficiency of this system. When a country's legal system can reliably and efficiently enforce agreements that businesses make and protect people's property and investments, the economy can function. If there are strong disagreements, a contract broken, or a bankruptcy, a well-developed legal system makes working these things out fair and orderly. When the government fails to do these things, investing and doing business in a country is a lot riskier and inefficient. A strong rule of law also helps stamp out corruption and other activities that discourage profit seeking and prevent the most highly valued products and businesses from thriving.

We measure rule of law by combining measures related to the efficiency of the legal framework in settling disputes (WEF), property rights (WEF), protecting investors (World Bank/IFC), and enforcing contracts (World Bank/IFC). The pieces of our rule of law indicator are shown in the table below. As with our measures of corruption and bureaucracy, the rule of law tends to be strongly related to a country's income. Again, we won't delve into all the reasons here, but it's intuitive that countries that have less resources and less educated populations have more immature legal systems, and the rule of law is likely compounded by interrelated factors, like higher corruption. Here we want to look at the rule of law of a country taking into account its development stage. That gives us a better sense of the underlying cultural elements that will determine its lawfulness as it develops. It's also a more helpful perspective in looking at future growth. As with our measures of bureaucracy and corruption, we would expect that businessmen and investors will likely expect there to be lower rule of law in poorer countries, and so it may not impact their decision to do business or invest in an emerging country that is otherwise competitive. But if the rule of law is particularly weak in that country relative to others of similar income, that is likely a drag. Indeed, we see no relationship between the rule of law on its own and future growth. But once we exclude the effect of income, our gauge of the rule of law is 57% correlated to historical future growth in income per capita. In other words, when countries still fail to uphold the rule of law once they are rich, their cultures often appear to be holding back their growth. Along with our measures of bureaucracy and corruption, this gauge helps us triangulate the picture of how hard it is to do business in a country.

| Rule of Law  | Correlation to<br>Growth |      | Weight |
|--|--------------------------|------|--------|
| <b>Aggregate Ex. Income Effect</b>                 | 57%                      | ---  |        |
| <b>Aggregate</b>                                   | 5%                       | 100% |        |
| Efficiency of legal framework in settling disputes | 10%                      | 25%  |        |
| Property rights                                    | -8%                      | 25%  |        |
| Protecting Investors                               | 0%                       | 25%  |        |
| Enforcing Contracts                                | 13%                      | 25%  |        |

Before taking into account income levels, Singapore, Japan, and the English-speaking developed world are at the top of our ranking. Despite its wealth and development stage, Italy ranks near the bottom of the list, just ahead of Argentina, Greece, and Russia. Emerging countries also tend to perform poorly on this measure. Once we exclude the effect of income, Italy and Greece stand out as having an especially weak rule of law. In general, the European periphery and Latin American countries rate toward the bottom, with the rest of the developed world and emerging Asian countries toward the top. Singapore stays at the top even after taking out income, along with other rich nations. The US and Japan rate as having a rule of law that is just modestly strong given their levels of income.



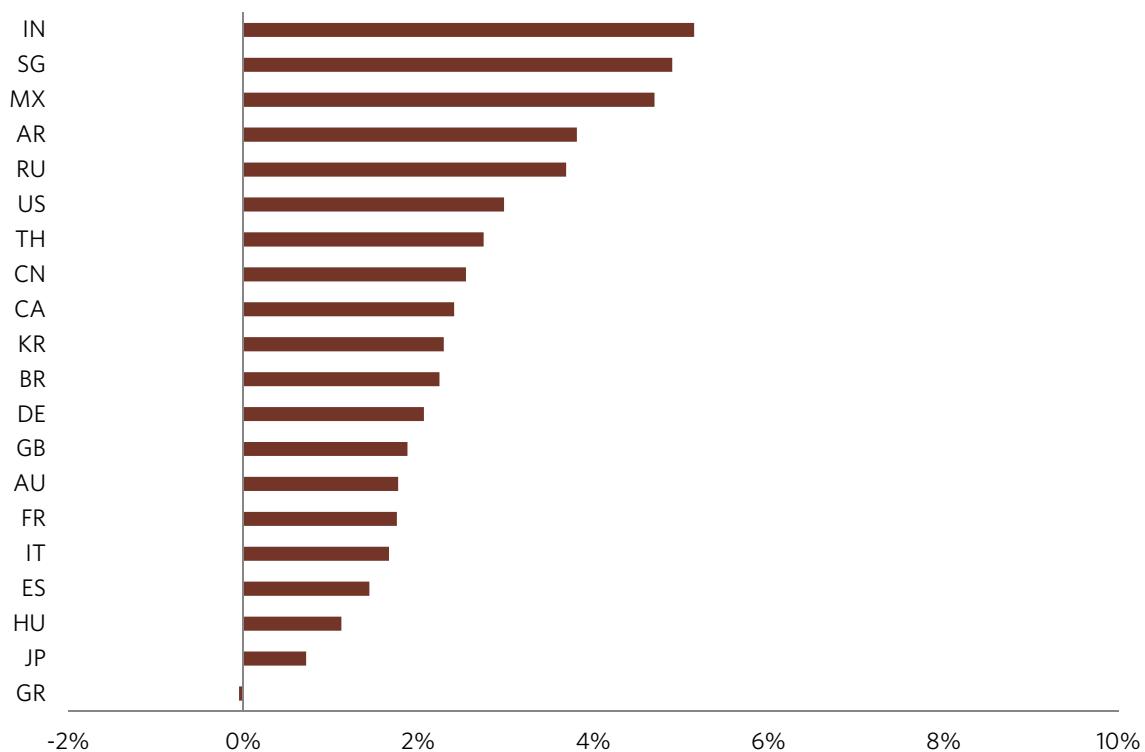
Below you can see a more granular view of how each country scored for each measure.

| Country  | SG  | GB   | CA   | US  | JP  | DE   | AU   | FR   | TH   | KR   | CN   | ES   | MX   | IN   | BR   | HU   | IT   | RU   | GR   | AR   |
|--|-----|------|------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Efficiency of legal framework in settling disputes | 3.4 | 2.3  | 2.1  | 0.9 | 0.9 | 1.8  | 0.9  | 0.0  | -0.5 | -1.0 | 0.1  | -0.7 | -1.4 | -1.8 | -3.0 | -2.0 | -2.7 | -2.6 |      |      |
| Property rights                                    | 2.7 | 2.3  | 2.1  | 0.5 | 1.7 | 1.8  | 0.8  | 1.5  | -1.5 | -0.5 | -0.3 | -0.2 | -1.2 | -0.8 | -0.4 | -2.0 | -1.0 | -3.3 | -1.6 | -4.2 |
| Protecting Investors                               | 2.5 | 2.2  | 2.4  | 2.3 | 1.9 | -1.4 | -0.2 | -0.7 | 2.1  | 0.5  | -1.4 | -1.4 | -0.2 | 1.2  | 0.7  | -2.7 | 0.5  | -2.1 | -0.9 | -1.4 |
| Enforcing Contracts                                | 1.3 | -0.3 | -0.3 | 1.4 | 0.5 | 1.6  | 1.2  | 1.5  | 1.0  | 1.7  | 1.1  | -0.4 | -0.8 | -5.0 | -2.6 | 1.2  | -2.2 | 1.4  | -1.7 | -0.3 |

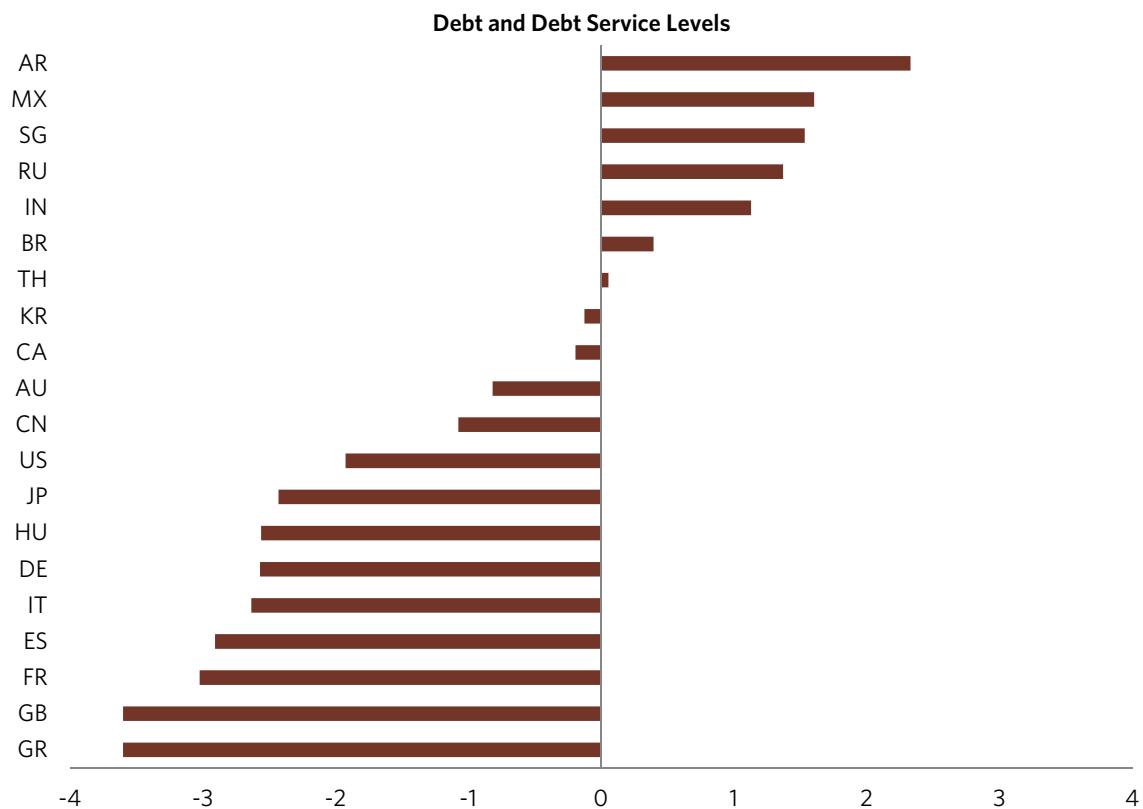
## Our Indebtedness Gauge

| Indebtedness                 | Correlation | Contribution to Estimate |
|------------------------------|-------------|--------------------------|
| <b>Aggregate</b>             | <b>44%</b>  | <b>35.0%</b>             |
| Debt and Debt Service Levels | 26%         | 12.0%                    |
| Debt Flow                    | -18%        | 5.5%                     |
| Monetary Policy              | 30%         | 17.5%                    |

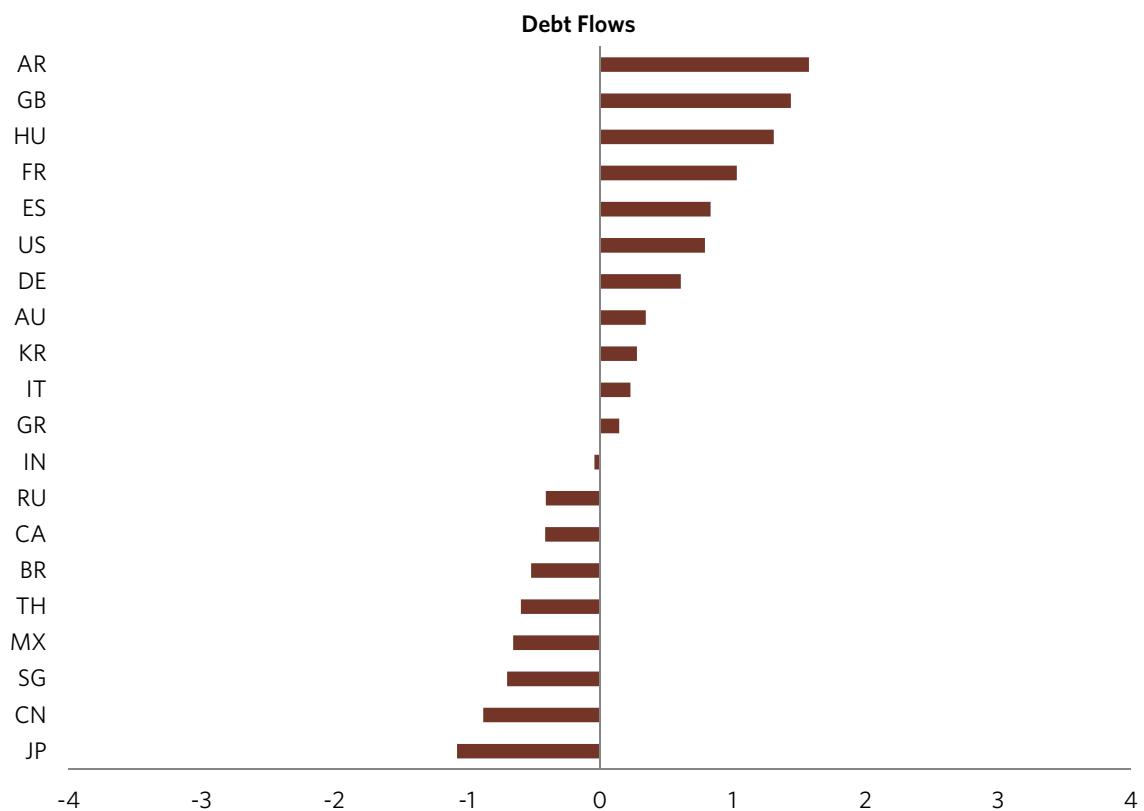
Indebtedness Estimate of Future Growth



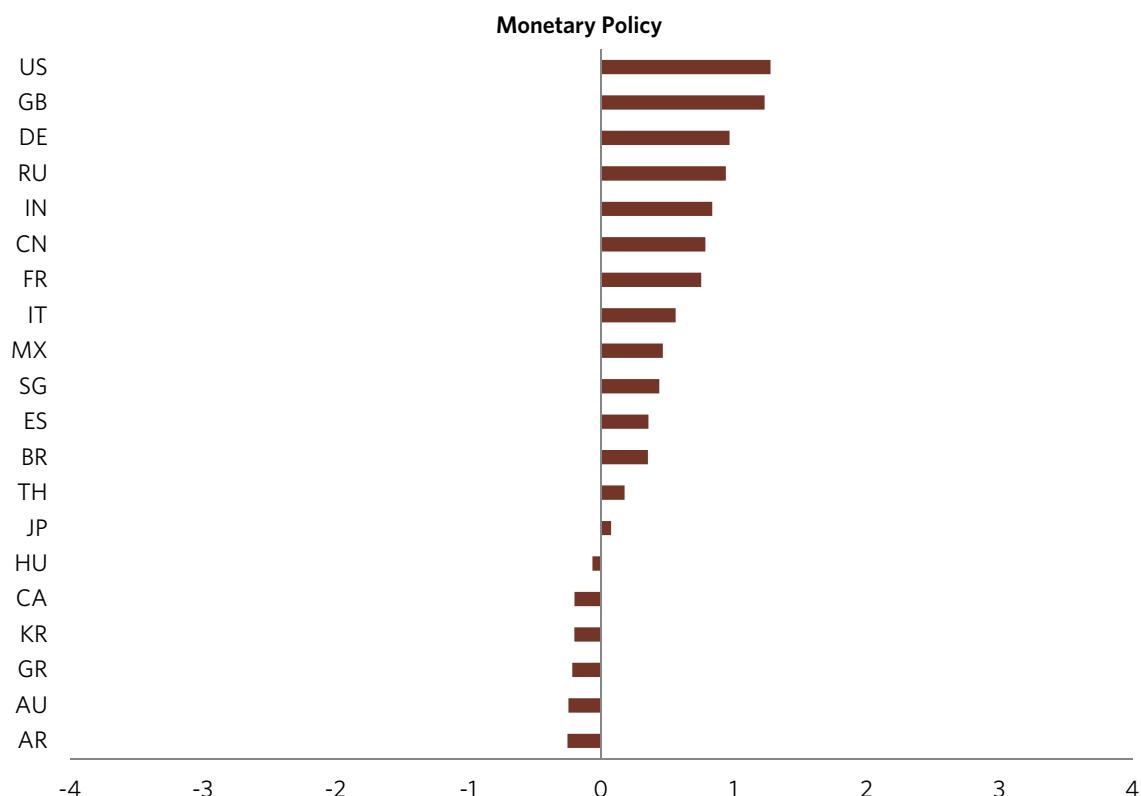
## Debt and Debt Service Levels



## Debt Flow



## Monetary Policy

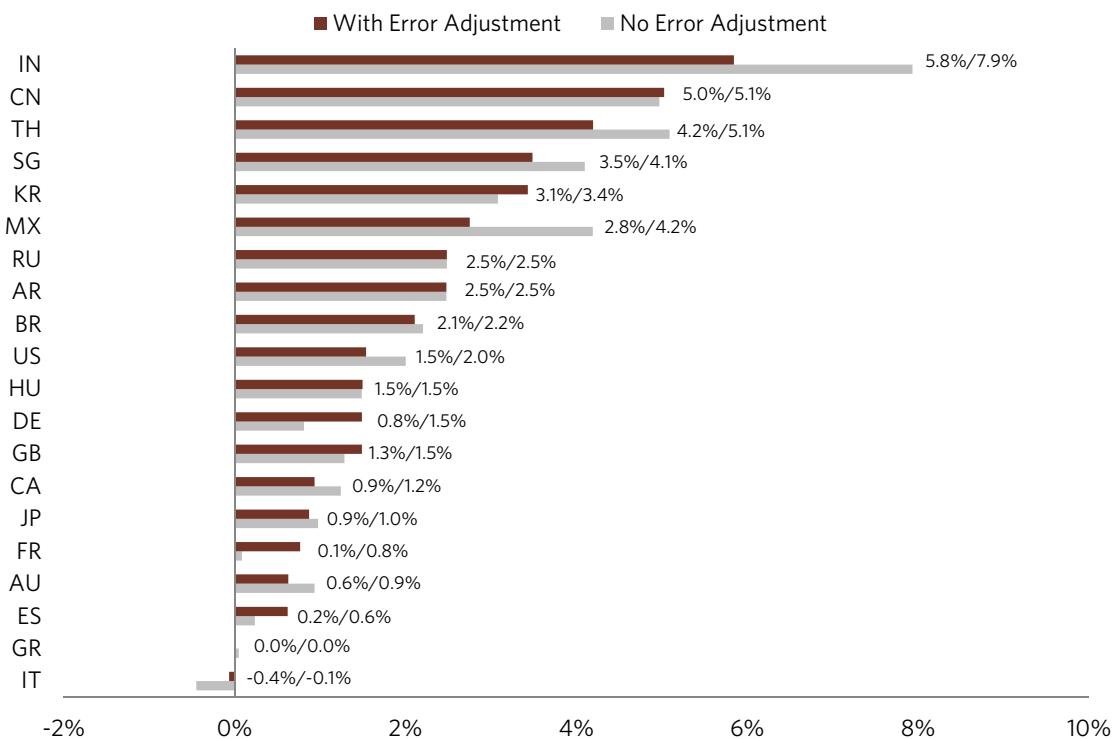


## Summary Observations

On the basis of productivity and indebtedness alone, the countries which have the elements to grow incomes per worker fastest today are India, China, Thailand, Singapore and Korea. Based on these elements, European countries and Japan are expected to grow slowest. While, the different pieces that go into this view are described above, we'll also describe them briefly here. We expect India to grow strongly (6% or so), primarily because of India's low indebtedness and significant cost advantage relative to the rest of the world even accounting for its poor education (its income per capita is just \$1,000, 4x less than China's). While incomes have grown very fast in China and there has been a material leveraging, we still expect fairly strong growth of 5% due to China's strong competitive position. The Chinese labor force remains highly attractive as a result of their work ethic and how educated they are relative to the cost, and they continue to save at a high rate, providing capital that is invested in projects that will improve productivity in the future. China's culture of self-sufficiency and achievement also provides a material support. Of course the policies of these countries can shift these growth rates. Most importantly in China the implementation of reforms and the management of the debt will be important and in India the reforms will be important. In both cases shifts in policies should be reflected in our indices.

This formula projects productivity growth in the US to be around 1.5%-2%, in the middle of the pack globally but ahead of most other rich nations. The US is now one of the more competitive developed world economies, with a well-educated but expensive workforce, despite an increasing preference for leisure and very low savings rates. While it is managing its deleveraging beautifully, it remains relatively highly indebted. We expect growth in Germany to be a bit lower than in the US. Germany is expensive relative to the US and central bank (ECB) stimulation has been less aggressive. At the same time, healthy household savings rates, a culture of innovation and commercialism, and good governance are positive supports for Germany's productivity growth. And Germany has not been reliant on credit expansion for its growth, and monetary policy is relatively stimulative relative to German conditions. On the lowest end we see Japan and the southern European countries, all of which are globally uncompetitive and highly indebted, and have a history of experiencing monetary policy that is tight relative to conditions. The growth prospects of Italy and Spain, along with France and a number of Latin American countries are also hindered by a culture that values savoring life over achievement or self sufficiency.

**Aggregate Estimate of Future Growth per Worker**



## Part 2: Economic Health Indices by Country, and the Prognoses That They Imply

While in Part 1 I showed economic health measures indicator by indicator, in this part I show them country by country. By turning to the countries that you are interested in, you will be able to see all of the influences and what they imply for economic growth over the next 10 years for each of those countries in one simple table. They are shown in the order of projected economic growth rates and can be found by looking at the table of contents on the next page.

The projected economic growth rates for each country are shown and attributed to a) the average annual growth rate of the working population and b) the projected average annual change in the output per worker. The projected change in the average annual output per worker is determined two thirds by that country's projected productivity growth and one third by the size of its debt burdens. The determinants of each country's productivity growth are shown in several gauges that reflect each of the drivers (e.g. cost competitiveness, work attitudes, etc.). These are conveyed in tables that show - 1) the deviation of that country's determinant from the world average (shown in standard deviation terms), and 2) the ranking of that country (among the 20 countries shown) for that indicator. In other words, this one simple table will provide you virtually all that you need to know to gauge each country's economic health and its prospects for the next 10 years. By scanning the table and reading the accompanying text, you will be able to see a country's biggest strengths, and biggest weaknesses. The projections do not take into consideration exogenous factors such as the discoveries of natural resources and wars which will influence growth rates and are beyond my ability to forecast.

The table will not provide the thinking or the individual statistics that are behind each of these gauges. Should you wish to see the individual statistics behind these gauges, you can get them in the appendix to this section. Unfortunately, we are not able to share the statistics underlying our indebtedness measures, which are proprietary.

To be clear, these health indicators show where the current conditions will lead, not what is inevitable. If countries change the influences on their health, like individuals who stop smoking and start exercising, they can improve their prognoses. In fact, while we expect the countries that are more efficient (as measured by our gauges) to do better than those that are less efficient, we expect those that remove their impediments to have the biggest improvements to growth - just as China's strong growth over the last couple decades resulted from it ending its closed-door policy.

It should be noted that there was no subjective judgment used in coming up with these numbers, or even in coming up with the text that explains these indicators. Both the numbers and the text were computer generated. As explained in Part 1 my process of converting indicators into health gauge measures and in turn into projections for growth is very straightforward. To help it to be better understood and to provide each person with their own abilities to vary the processes in the ways they prefer, I am willing to make these statistics and processes open to those who are interested so that they can assess the relationships and change the weights in the ways they think are best.

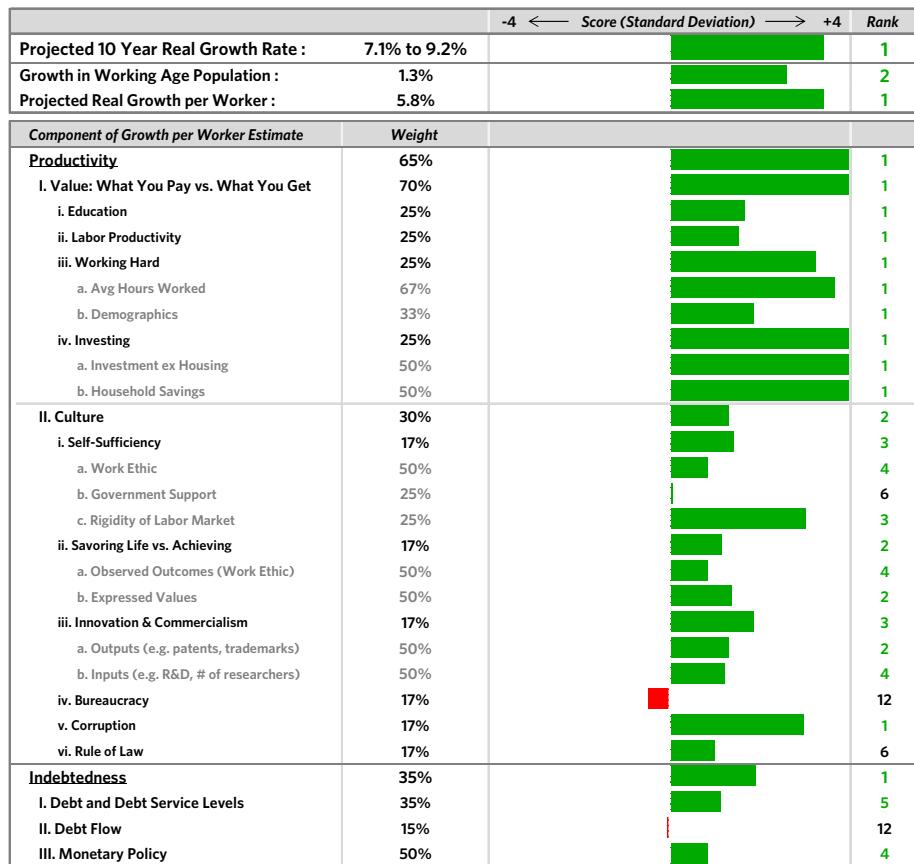
## Table of Contents

| <b>Country</b> | <b>Projected Real Growth Rate</b> | <b>Rank</b> | <b>Page</b> |
|----------------|-----------------------------------|-------------|-------------|
| India          | 7.1% to 9.2%                      | 1           | 248         |
| China          | 5.0%                              | 2           | 250         |
| Singapore      | 4.2% to 4.8%                      | 3           | 252         |
| Mexico         | 4.1% to 5.5%                      | 4           | 251         |
| Thailand       | 4.0% to 4.9%                      | 5           | 253         |
| Argentina      | 3.3%                              | 6           | 255         |
| Korea          | 2.7% to 3.1%                      | 7           | 257         |
| Brazil         | 2.9% to 3.0%                      | 8           | 259         |
| USA            | 1.8% to 2.2%                      | 9           | 261         |
| United Kingdom | 1.5% to 1.7%                      | 10          | 263         |
| Russia         | 1.5%                              | 11          | 265         |
| Australia      | 1.3% to 1.7%                      | 12          | 267         |
| Canada         | 1.1% to 1.4%                      | 13          | 269         |
| Germany        | 0.1% to 0.8%                      | 14          | 271         |
| France         | 0.1% to 0.8%                      | 15          | 273         |
| Hungary        | 0.7% to 0.8%                      | 16          | 275         |
| Spain          | 0.1% to 0.5%                      | 17          | 277         |
| Japan          | 0.1% to 0.2%                      | 18          | 279         |
| Italy          | -0.7% to -0.4%                    | 19          | 281         |
| Greece         | -0.4%                             | 20          | 286         |

## India's Future Growth

Based on our economic health index, we project that India's real growth rate over the next 10 years will be in the vicinity of 7.1% to 9.2%. This growth rate is well above the global average, ranked 1 out of 20 major economies, and 1 out of 9 emerging countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In India's case, our growth estimate comes from combining our expectation of a 5.8% growth rate per worker, which is well above the global average, and a labor force growth rate of 1.3%, which is well above other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect India's productivity to be much better than most major countries (implying a growth rate of 9.4% on its own), and indebtedness conditions to be better than other countries (implying a growth rate of 5.2% on its own). As shown below, India's biggest relative strengths are the value its workers provide relative to education levels and its levels of investment, and its biggest relative problems are its level of bureaucracy and its reliance on credit flows for growth (though compared to other countries it doesn't rate especially poorly on these measures). The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

**Economic Health Index: India**



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

As mentioned, the descriptions below are based on influences which are conveyed in gauges that are made up of a composite of indicators, shown both in Part 1 and in the appendix. So, if you want to see why we are saying what we are saying, you can trace them through by looking at those statistics.

### **Productivity**

#### **I. Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

India offers much better than average value, ranked 1 among the countries we measure. Its workers are very inexpensive, even taking into consideration India's low levels of education and very poor quality of education. Further, people in India work very hard relative to the cost of their labor - the average male of working age works 37 hours per week (2 out of 20 countries), and the demographics of the workforce are very favorable. Levels of saving and investing are high given India's very low per capita income levels, with investment at about 14% of GDP (15 out of 20 countries).

#### **II. Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

India's culture looks to be a support to growth in coming years because it is ranked 2 out of 20 countries in this culture gauge. Note that our culture measures compare India to countries of similar levels of economic development. Starting with self-sufficiency, India is rated pretty well on this measure, weighing that its workers have a somewhat strong work ethic, its level of government support is neutral (with government outlays at 27% of GDP), and its labor markets are very flexible. India also seems to value achieving a bit more than savoring - again, its work ethic is somewhat strong, and surveys suggest that its people value accomplishment and achievement. Furthermore, innovation and commercialism are somewhat strong in India relative to income. We see the country investing heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are high. Finally, according to the international measures we are using, India has average levels of bureaucracy and red tape, very low corruption, and somewhat strong rule of law relative to its income.

### **Indebtedness**

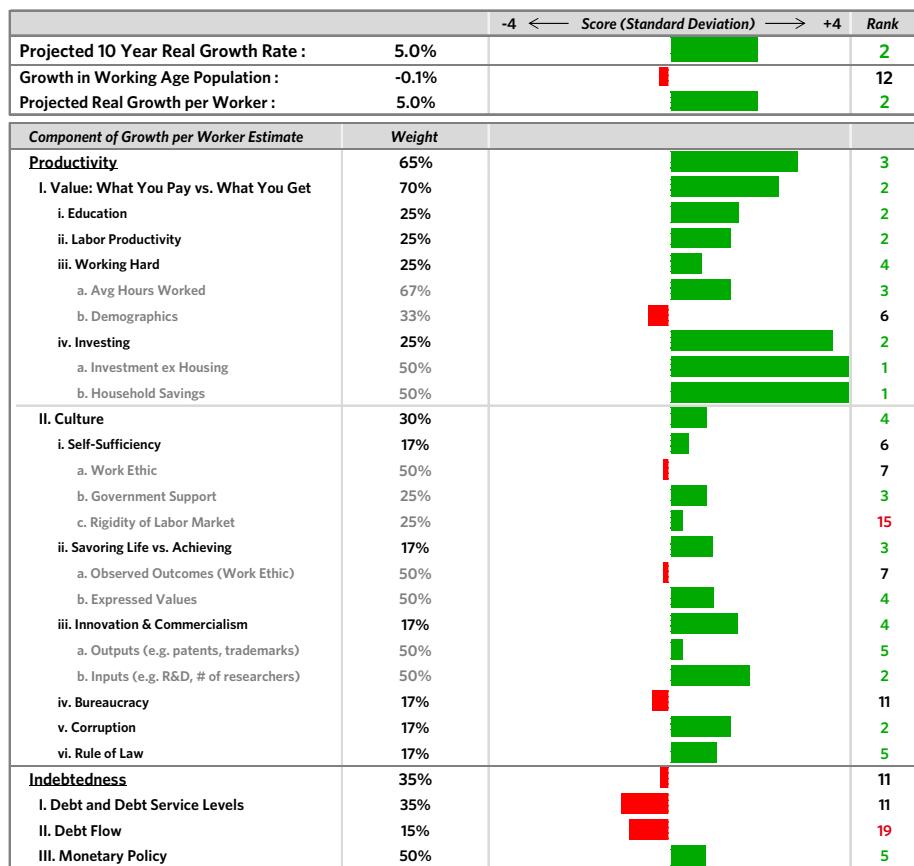
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. India's indebtedness position is better than other countries, ranked 1 out of the 20 countries we look at. The country has a moderate amount of room to lever up in the future, with a total debt burden of around 135% of GDP, compared to the global average of 200-250%. In the past few years, its growth was neither supported nor depressed by credit creation, which is neutral for growth going forward. Lastly, the stance of monetary policy is generally a bit stimulative.

## China's Future Growth

Based on our economic health index, we project that China's real growth rate over the next 10 years will be in the vicinity of 5.0%. This growth rate is well above the global average, ranked 2 out of 20 major economies, and 2 out of 9 emerging countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In China's case, our growth estimate comes from combining our expectation of a 5.0% growth rate per worker, which is well above the global average, and a labor force growth rate of -0.1%, which is roughly in line with other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect China's productivity to be much better than most major countries (implying a growth rate of 6.3% on its own), and indebtedness conditions to be about average compared to other countries (implying a growth rate of 2.5% on its own). As shown below, China's biggest relative strengths are its levels of investment and the value its workers provide relative to education levels, and its biggest relative problems are its debt and debt service levels and its reliance on credit flows for growth. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: China



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

As mentioned, the descriptions below are based on influences which are conveyed in gauges that are made up of a composite of indicators, shown both in Part 1 and in the appendix. So, if you want to see why we are saying what we are saying, you can trace them through by looking at those statistics.

### **Productivity**

#### I. **Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

China offers much better than average value, ranked 2 among the countries we measure. Its workers are somewhat inexpensive, even taking into consideration China's low levels of education and about average quality of education. Further, people in China work hard relative to the cost of their labor - the average male of working age works 35 hours per week (3 out of 20 countries), and the demographics of the workforce are about average. Levels of saving and investing are high given China's low per capita income levels, with investment at about 30% of GDP (1 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

China's culture looks to be a support to growth in coming years because it is ranked 4 out of 20 countries in this culture gauge. Note that our culture measures compare China to countries of similar levels of economic development. Starting with self-sufficiency, China is rated about average on this measure, weighing that its workers have a roughly average work ethic, its level of government support is low (with government outlays at 24% of GDP), and its labor markets are neither rigid nor flexible. China also seems to value achieving a bit more than savoring - again, its work ethic is roughly average, and surveys suggest that its people value accomplishment and achievement. Furthermore, innovation and commercialism are somewhat strong in China relative to income. We see the country investing very heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are about average. Finally, according to the international measures we are using, China has average levels of bureaucracy and red tape, somewhat low corruption, and somewhat strong rule of law relative to its income.

### **Indebtedness**

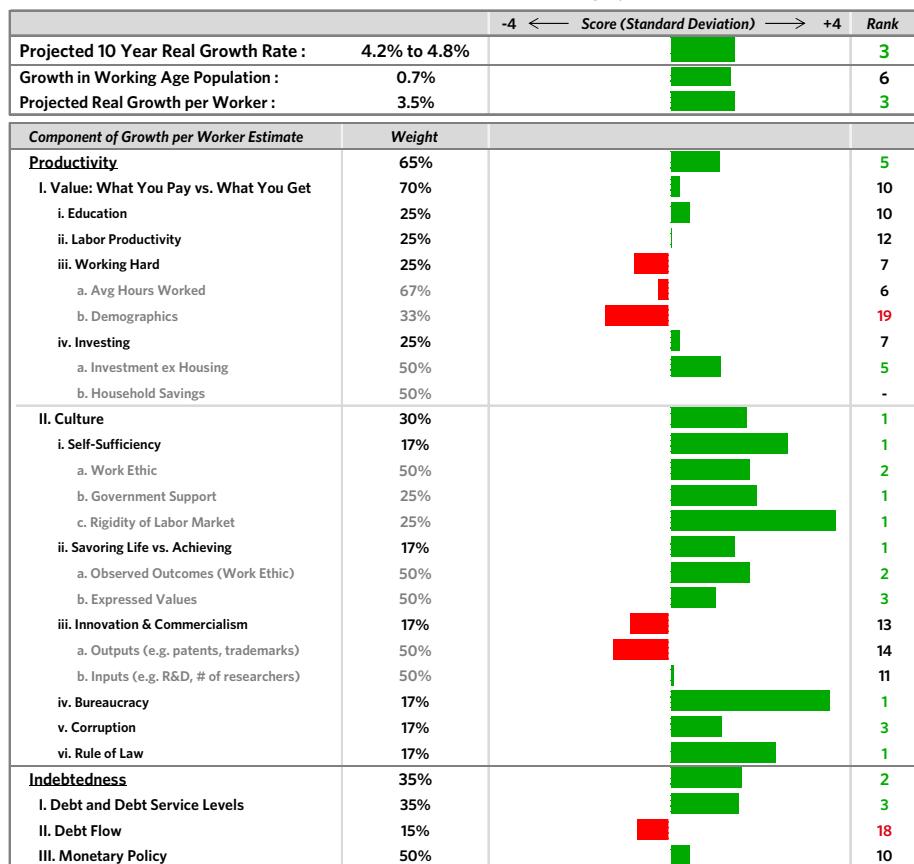
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. China's indebtedness position is about average compared to other countries, ranked 11 out of the 20 countries we look at. The country has little room to lever up in the future, with a total debt burden of around 216% of GDP, compared to the global average of 200-250%. In the past few years, its growth was supported by high credit creation, which is restrictive for growth going forward. Lastly, the stance of monetary policy is generally a bit stimulative.

## Singapore's Future Growth

Based on our economic health index, we project that Singapore's real growth rate over the next 10 years will be in the vicinity of 4.2% to 4.8%. This growth rate is somewhat above the global average, ranked 3 out of 20 major economies, and 1 out of 11 developed countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Singapore's case, our growth estimate comes from combining our expectation of a 3.5% growth rate per worker, which is well above the global average, and a labor force growth rate of 0.7%, which is somewhat above other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Singapore's productivity to be somewhat better than most major countries (implying a growth rate of 3.7% on its own), and indebtedness conditions to be better than other countries (implying a growth rate of 4.9% on its own). As shown below, Singapore's biggest relative strengths are its debt and debt service levels and its level of bureaucracy, and its biggest relative problems are how hard its people work and its reliance on credit flows for growth. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

**Economic Health Index: Singapore**



Scores shown as number of standard deviations away from the average observation across countries and time.

## More Detail

As mentioned, the descriptions below are based on influences which are conveyed in gauges that are made up of a composite of indicators, shown both in Part 1 and in the appendix. So, if you want to see why we are saying what we are saying, you can trace them through by looking at those statistics.

### *Productivity*

#### I. *Value: What You Pay Versus What You Get*

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Singapore offers around average value, ranked 10 among the countries we measure. Its workers are neither expensive nor inexpensive, taking into consideration Singapore's high levels of education and very good quality of education. Further, people in Singapore don't work especially hard relative to the cost of their labor - the average male of working age works 35 hours per week (5 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are roughly average given Singapore's high per capita income levels, with investment at about 25% of GDP (4 out of 20 countries).

#### II. *Culture*

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Singapore's culture looks to be a significant support to growth in coming years because it is ranked 1 out of 20 countries in this culture gauge. Note that our culture measures compare Singapore to countries of similar levels of economic development. Starting with self-sufficiency, Singapore is rated very well on this measure, weighing that its workers have a strong work ethic, its level of government support is very low (with government outlays at 15% of GDP), and its labor markets are very flexible. Singapore also seems to value achieving a bit more than savoring - again, its work ethic is strong, and surveys suggest that its people value accomplishment and achievement. Furthermore, innovation and commercialism are somewhat weak in Singapore relative to income. We see the country investing neither lightly nor heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are low. Finally, according to the international measures we are using, Singapore has very low bureaucracy and red tape, somewhat low corruption, and very strong rule of law relative to its income.

### *Indebtedness*

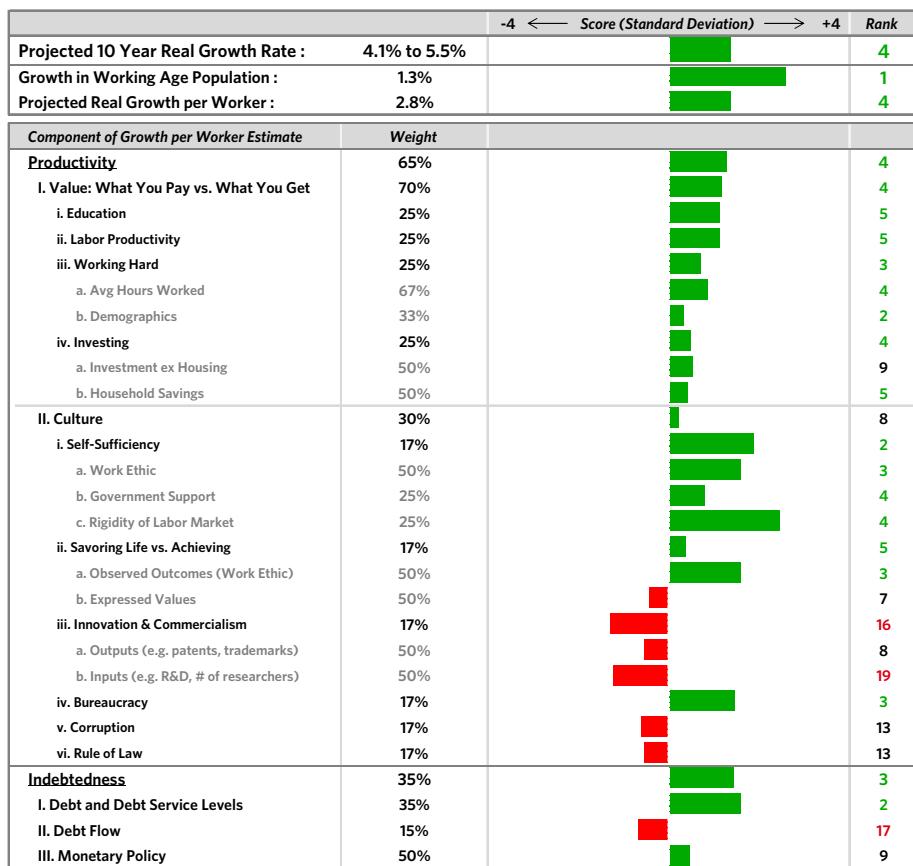
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Singapore's indebtedness position is better than other countries, ranked 2 out of the 20 countries we look at. The country has a moderate amount of room to lever up in the future, with a total debt burden of around 217% of GDP, compared to the global average of 200-250%. In the past few years, its growth was supported by high credit creation, which is restrictive for growth going forward. Lastly, the stance of monetary policy is generally neutral.

## Mexico's Future Growth

Based on our economic health index, we project that Mexico's real growth rate over the next 10 years will be in the vicinity of 4.1% to 5.5%. This growth rate is somewhat above the global average, ranked 4 out of 20 major economies, and 3 out of 9 emerging countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Mexico's case, our growth estimate comes from combining our expectation of a 2.8% growth rate per worker, which is well above the global average, and a labor force growth rate of 1.3%, which is well above other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Mexico's productivity to be somewhat better than most major countries (implying a growth rate of 3.9% on its own), and indebtedness conditions to be better than other countries (implying a growth rate of 4.7% on its own). As shown below, Mexico's biggest relative strengths are its debt and debt service levels and the value its workers provide relative to education levels, and its biggest relative problems are its reliance on credit flows for growth and its level of innovation/commercialism. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

**Economic Health Index: Mexico**



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

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### **Productivity**

#### I. **Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Mexico offers somewhat better than average value, ranked 4 among the countries we measure. Its workers are somewhat inexpensive, even taking into consideration Mexico's somewhat low levels of education and very poor quality of education. Further, people in Mexico work hard relative to the cost of their labor - the average male of working age works 35 hours per week (4 out of 20 countries), and the demographics of the workforce are about average. Levels of saving and investing are roughly average given Mexico's low per capita income levels, with investment at about 14% of GDP (16 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Mexico's culture looks to be neutral for growth in coming years because it is ranked 8 out of 20 countries in this culture gauge. Note that our culture measures compare Mexico to countries of similar levels of economic development. Starting with self-sufficiency, Mexico is rated very well on this measure, weighing that its workers have a strong work ethic, its level of government support is low (with government outlays at 27% of GDP), and its labor markets are very flexible. Mexico also seems to value achieving a bit more than savoring - again, its work ethic is strong, and surveys suggest that its people moderately value accomplishment and achievement. Furthermore, innovation and commercialism are somewhat weak in Mexico relative to income. We see the country investing lightly in research and innovation, and its outputs from innovation, including inventions and earnings, are low. Finally, according to the international measures we are using, Mexico has somewhat low bureaucracy and red tape, somewhat high corruption, and somewhat weak rule of law relative to its income.

### **Indebtedness**

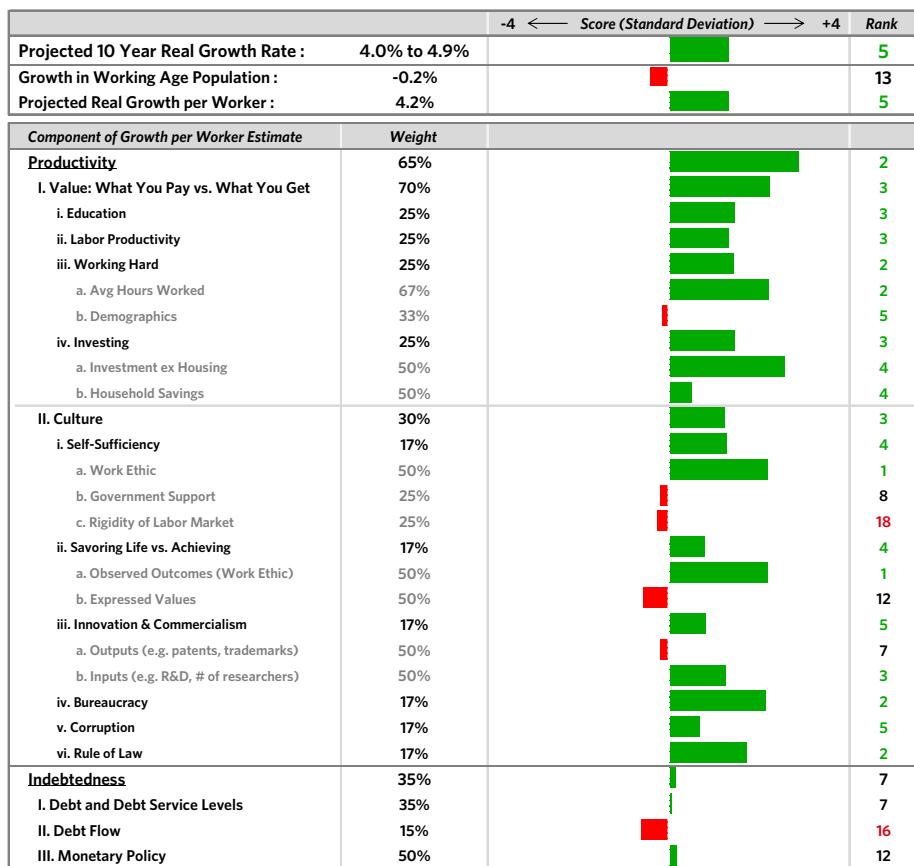
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Mexico's indebtedness position is better than other countries, ranked 3 out of the 20 countries we look at. The country has plenty of room to lever up in the future, with a total debt burden of around 84% of GDP, compared to the global average of 200-250%. In the past few years, its growth was supported by high credit creation, which is restrictive for growth going forward. Lastly, the stance of monetary policy is generally neutral.

## Thailand's Future Growth

Based on our economic health index, we project that Thailand's real growth rate over the next 10 years will be in the vicinity of 4.0% to 4.9%. This growth rate is somewhat above the global average, ranked 5 out of 20 major economies, and 4 out of 9 emerging countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Thailand's case, our growth estimate comes from combining our expectation of a 4.2% growth rate per worker, which is somewhat above the global average, and a labor force growth rate of -0.2%, which is somewhat below other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Thailand's productivity to be much better than most major countries (implying a growth rate of 6.4% on its own), and indebtedness conditions to be slightly better than other countries (implying a growth rate of 2.7% on its own). As shown below, Thailand's biggest relative strengths are its levels of investment and how hard its people work, and its biggest relative problems are its reliance on credit flows for growth and its debt and debt service levels (though compared to other countries it doesn't rate especially poorly on these measures). The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Thailand



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

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### **Productivity**

#### I. **Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Thailand offers much better than average value, ranked 3 among the countries we measure. Its workers are somewhat inexpensive, even taking into consideration Thailand's somewhat low levels of education and poor quality of education. Further, people in Thailand work hard relative to the cost of their labor - the average male of working age works 40 hours per week (1 out of 20 countries), and the demographics of the workforce are about average. Levels of saving and investing are somewhat high given Thailand's very low per capita income levels, with investment at about 19% of GDP (6 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Thailand's culture looks to be a support to growth in coming years because it is ranked 3 out of 20 countries in this culture gauge. Note that our culture measures compare Thailand to countries of similar levels of economic development. Starting with self-sufficiency, Thailand is rated pretty well on this measure, weighing that its workers have a strong work ethic, its level of government support is neutral (with government outlays at 24% of GDP), and its labor markets are neither rigid nor flexible. Thailand also seems to value achieving a bit more than savoring - again, its work ethic is strong, though surveys suggest that its people don't especially value accomplishment and achievement. Furthermore, innovation and commercialism are somewhat strong in Thailand relative to income. We see the country investing heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are about average. Finally, according to the international measures we are using, Thailand has very low bureaucracy and red tape, somewhat low corruption, and very strong rule of law relative to its income.

### **Indebtedness**

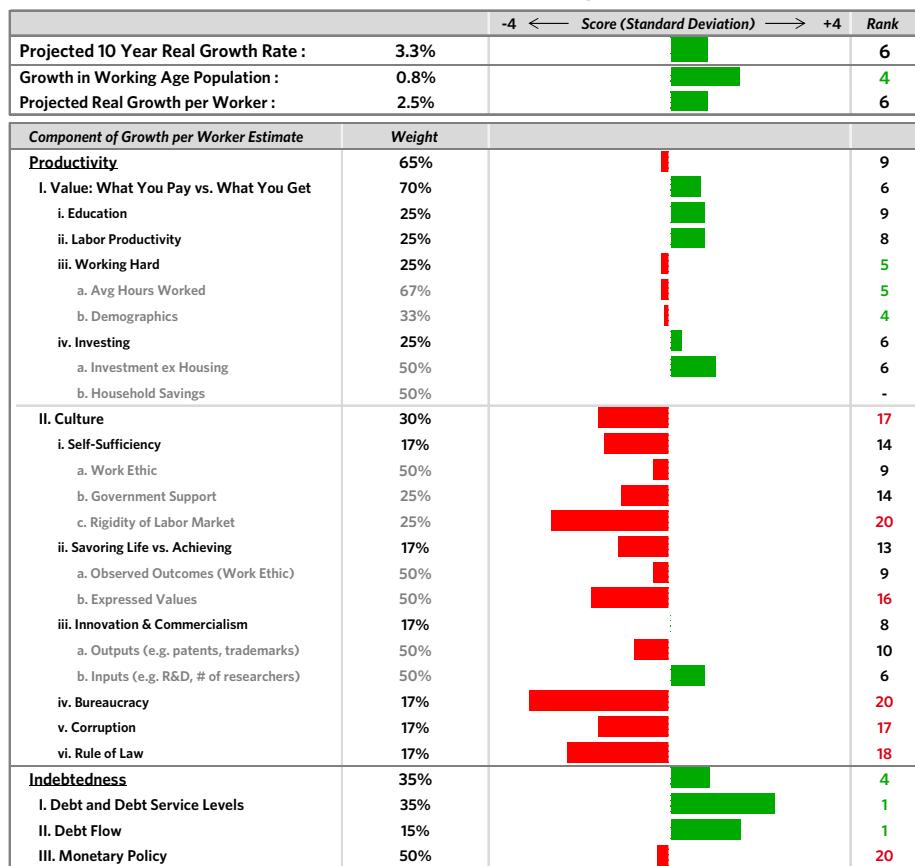
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Thailand's indebtedness position is slightly better than other countries, ranked 7 out of the 20 countries we look at. The country has a bit of room to lever up in the future, with a total debt burden of around 156% of GDP, compared to the global average of 200-250%. In the past few years, its growth was supported by high credit creation, which is restrictive for growth going forward. Lastly, the stance of monetary policy is generally neutral.

## Argentina's Future Growth

Based on our economic health index, we project that Argentina's real growth rate over the next 10 years will be in the vicinity of 3.3%. This growth rate is somewhat above the global average, ranked 6 out of 20 major economies, and 5 out of 9 emerging countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Argentina's case, our growth estimate comes from combining our expectation of a 2.5% growth rate per worker, which is somewhat above the global average, and a labor force growth rate of 0.8%, which is well above other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Argentina's productivity to be about average compared to most major countries (implying a growth rate of 1.8% on its own), and indebtedness conditions to be better than other countries (implying a growth rate of 3.8% on its own). As shown below, Argentina's biggest relative strengths are its debt and debt service levels and the value its workers provide relative to education levels, and its biggest relative problems are its level of bureaucracy and its rule of law. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Argentina



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

As mentioned, the descriptions below are based on influences which are conveyed in gauges that are made up of a composite of indicators, shown both in Part 1 and in the appendix. So, if you want to see why we are saying what we are saying, you can trace them through by looking at those statistics.

### **Productivity**

#### I. **Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Argentina offers somewhat better than average value, ranked 6 among the countries we measure. Its workers are somewhat inexpensive, even taking into consideration Argentina's low levels of education and very poor quality of education. Further, people in Argentina work an average amount relative to the cost of their labor - the average male of working age works 29 hours per week (7 out of 20 countries), and the demographics of the workforce are about average. Levels of saving and investing are roughly average given Argentina's low per capita income levels, with investment at about 17% of GDP (9 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Argentina's culture looks to be a significant headwind to growth in coming years because it is ranked 17 out of 20 countries in this culture gauge. Note that our culture measures compare Argentina to countries of similar levels of economic development. Starting with self-sufficiency, Argentina is rated pretty poorly on this measure, weighing that its workers have a somewhat weak work ethic, its level of government support is high (with government outlays at 41% of GDP), and its labor markets are very rigid. Argentina also seems to value savoring a bit more than achieving - again, its work ethic is somewhat weak, and surveys suggest that its people don't value accomplishment and achievement. Furthermore, innovation and commercialism are about average in Argentina relative to income. We see the country investing heavily in research and innovation, though its outputs from innovation, including inventions and earnings, are low. Finally, according to the international measures we are using, Argentina has very high bureaucracy and red tape, very high corruption, and very weak rule of law relative to its income.

### **Indebtedness**

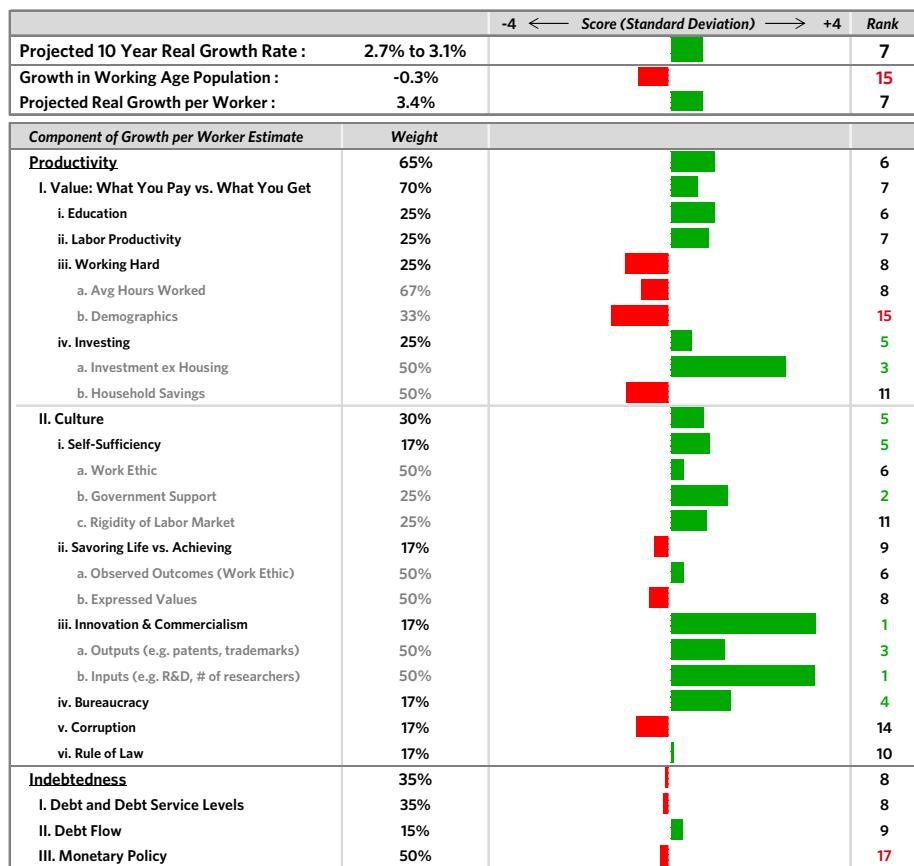
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Argentina's indebtedness position is better than other countries, ranked 4 out of the 20 countries we look at. The country has plenty of room to lever up in the future, with a total debt burden of around 37% of GDP, compared to the global average of 200-250%. In the past few years, its growth was very depressed by low credit creation, which is very supportive for growth going forward. Lastly, the stance of monetary policy is generally neutral.

## Korea's Future Growth

Based on our economic health index, we project that Korea's real growth rate over the next 10 years will be in the vicinity of 2.7% to 3.1%. This growth rate is somewhat above the global average, ranked 7 out of 20 major economies, and 6 out of 9 emerging countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Korea's case, our growth estimate comes from combining our expectation of a 3.4% growth rate per worker, which is somewhat above the global average, and a labor force growth rate of -0.3%, which is somewhat below other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Korea's productivity to be somewhat better than most major countries (implying a growth rate of 3.5% on its own), and indebtedness conditions to be slightly better than other countries (implying a growth rate of 2.3% on its own). As shown below, Korea's biggest relative strengths are the value its workers provide relative to education levels and its level of innovation/commercialism, and its biggest relative problems are how hard its people work and its monetary policy. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

**Economic Health Index: Korea**



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

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### **Productivity**

#### I. **Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Korea offers somewhat better than average value, ranked 7 among the countries we measure. Its workers are somewhat inexpensive, taking into consideration Korea's high levels of education and very good quality of education. Further, people in Korea don't work especially hard relative to the cost of their labor - the average male of working age works 29 hours per week (8 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are roughly average given Korea's about average per capita income levels, with investment at about 27% of GDP (2 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Korea's culture looks to be a support to growth in coming years because it is ranked 5 out of 20 countries in this culture gauge. Note that our culture measures compare Korea to countries of similar levels of economic development. Starting with self-sufficiency, Korea is rated pretty well on this measure, weighing that its workers have a roughly average work ethic, its level of government support is low (with government outlays at 22% of GDP), and its labor markets are moderately flexible. Korea also seems to value savoring about the same as it values achieving - again, its work ethic is roughly average, and surveys suggest that its people moderately value accomplishment and achievement. Furthermore, innovation and commercialism are very strong in Korea relative to income. We see the country investing very heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are high. Finally, according to the international measures we are using, Korea has somewhat low bureaucracy and red tape, somewhat high corruption, and average rule of law relative to its income.

### **Indebtedness**

*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Korea's indebtedness position is slightly better than other countries, ranked 8 out of the 20 countries we look at. The country has a bit of room to lever up in the future, with a total debt burden of around 277% of GDP, compared to the global average of 200-250%. In the past few years, its growth was neither supported nor depressed by credit creation, which is neutral for growth going forward. Lastly, the stance of monetary policy is generally neutral.

## Brazil's Future Growth

Based on our economic health index, we project that Brazil's real growth rate over the next 10 years will be in the vicinity of 2.9% to 3.0%. This growth rate is somewhat above the global average, ranked 8 out of 20 major economies, and 7 out of 9 emerging countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Brazil's case, our growth estimate comes from combining our expectation of a 2.1% growth rate per worker, which is somewhat above the global average, and a labor force growth rate of 0.8%, which is well above other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Brazil's productivity to be about average compared to most major countries (implying a growth rate of 2.2% on its own), and indebtedness conditions to be about average compared to other countries (implying a growth rate of 2.2% on its own). As shown below, Brazil's biggest relative strengths are the value its workers provide relative to education levels and its debt and debt service levels, and its biggest relative problems are its level of bureaucracy and how its people value savoring life versus achieving. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

**Economic Health Index: Brazil**

|  | -4 ← Score (Standard Deviation) → +4 | Rank |
|--|--------------------------------------|------|
| <b>Projected 10 Year Real Growth Rate :</b>    | 2.9% to 3.0%                         | 8    |
| <b>Growth in Working Age Population :</b>      | 0.8%                                 | 3    |
| <b>Projected Real Growth per Worker :</b>      | 2.1%                                 | 8    |
| <b>Component of Growth per Worker Estimate</b> | <b>Weight</b>                        |      |
| <b>Productivity</b>                            | 65%                                  | 7    |
| I. Value: What You Pay vs. What You Get        | 70%                                  | 5    |
| i. Education                                   | 25%                                  | 7    |
| ii. Labor Productivity                         | 25%                                  | 9    |
| iii. Working Hard                              | 25%                                  | 6    |
| a. Avg Hours Worked                            | 67%                                  | 7    |
| b. Demographics                                | 33%                                  | 3    |
| iv. Investing                                  | 25%                                  | 8    |
| a. Investment ex Housing                       | 50%                                  | 8    |
| b. Household Savings                           | 50%                                  | -    |
| II. Culture                                    | 30%                                  | 14   |
| i. Self-Sufficiency                            | 17%                                  | 12   |
| a. Work Ethic                                  | 50%                                  | 12   |
| b. Government Support                          | 25%                                  | 12   |
| c. Rigidity of Labor Market                    | 25%                                  | 9    |
| ii. Savoring Life vs. Achieving                | 17%                                  | 16   |
| a. Observed Outcomes (Work Ethic)              | 50%                                  | 12   |
| b. Expressed Values                            | 50%                                  | 17   |
| iii. Innovation & Commercialism                | 17%                                  | 10   |
| a. Outputs (e.g. patents, trademarks)          | 50%                                  | 16   |
| b. Inputs (e.g. R&D, # of researchers)         | 50%                                  | 7    |
| iv. Bureaucracy                                | 17%                                  | 17   |
| v. Corruption                                  | 17%                                  | 12   |
| vi. Rule of Law                                | 17%                                  | 14   |
| <b>Indebtedness</b>                            | 35%                                  | 10   |
| I. Debt and Debt Service Levels                | 35%                                  | 6    |
| II. Debt Flow                                  | 15%                                  | 15   |
| III. Monetary Policy                           | 50%                                  | 14   |

Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

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#### I. **Value: What You Pay Versus What You Get**

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Brazil offers somewhat better than average value, ranked 5 among the countries we measure. Its workers are somewhat inexpensive, even taking into consideration Brazil's low levels of education and very poor quality of education. Further, people in Brazil work an average amount relative to the cost of their labor - the average male of working age works 28 hours per week (9 out of 20 countries), and the demographics of the workforce are about average. Levels of saving and investing are roughly average given Brazil's low per capita income levels, with investment at about 15% of GDP (12 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Brazil's culture looks to be a headwind to growth in coming years because it is ranked 14 out of 20 countries in this culture gauge. Note that our culture measures compare Brazil to countries of similar levels of economic development. Starting with self-sufficiency, Brazil is rated about average on this measure, weighing that its workers have a somewhat weak work ethic, its level of government support is high (with government outlays at 40% of GDP), and its labor markets are moderately flexible. Brazil also seems to value savoring much more than achieving - again, its work ethic is somewhat weak, and surveys suggest that its people don't value accomplishment and achievement. Furthermore, innovation and commercialism are about average in Brazil relative to income. We see the country investing heavily in research and innovation, though its outputs from innovation, including inventions and earnings, are low. Finally, according to the international measures we are using, Brazil has very high bureaucracy and red tape, average levels of corruption, and somewhat weak rule of law relative to its income.

### **Indebtedness**

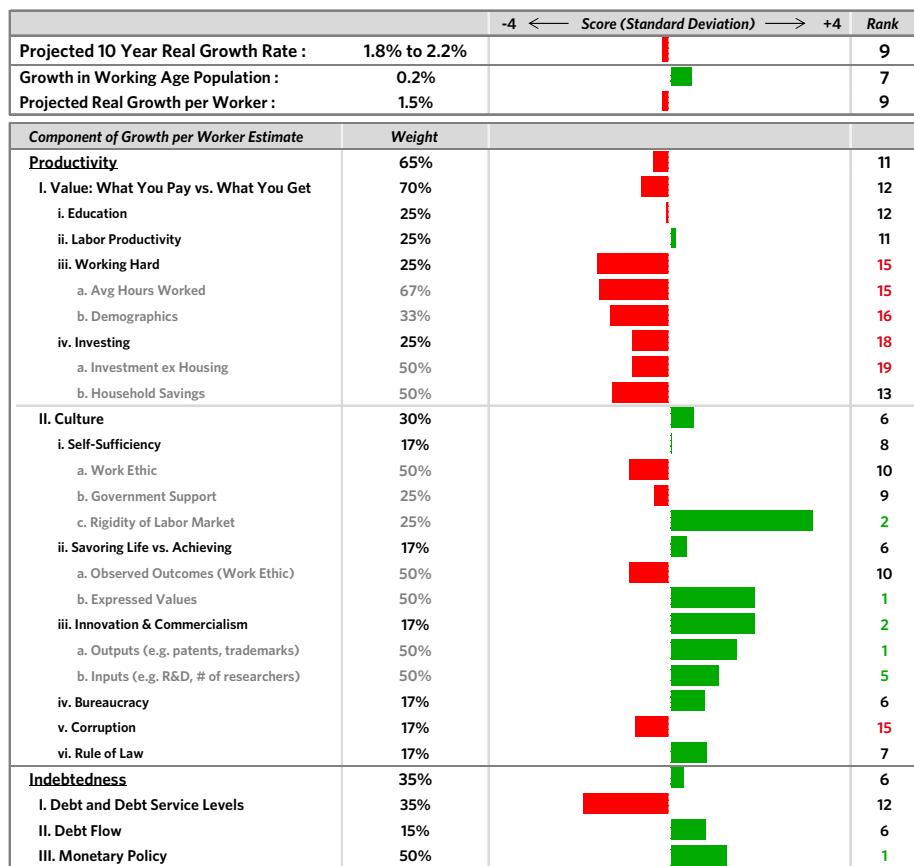
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Brazil's indebtedness position is about average compared to other countries, ranked 10 out of the 20 countries we look at. The country has a bit of room to lever up in the future, with a total debt burden of around 121% of GDP, compared to the global average of 200-250%. In the past few years, its growth was supported by high credit creation, which is restrictive for growth going forward. Lastly, the stance of monetary policy is generally neutral.

## USA's Future Growth

Based on our economic health index, we project that USA's real growth rate over the next 10 years will be in the vicinity of 1.8% to 2.2%. This growth rate is roughly at the global average, ranked 9 out of 20 major economies, and 2 out of 11 developed countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In USA's case, our growth estimate comes from combining our expectation of a 1.5% growth rate per worker, which is roughly in line with the global average, and a labor force growth rate of 0.2%, which is somewhat above other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect USA's productivity to be about average compared to most major countries (implying a growth rate of 1.5% on its own), and indebtedness conditions to be slightly better than other countries (implying a growth rate of 3.0% on its own). As shown below, USA's biggest relative strengths are its monetary policy and its level of innovation/commercialism, and its biggest relative problems are its debt and debt service levels and how hard its people work. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

**Economic Health Index: United States**



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

As mentioned, the descriptions below are based on influences which are conveyed in gauges that are made up of a composite of indicators, shown both in Part 1 and in the appendix. So, if you want to see why we are saying what we are saying, you can trace them through by looking at those statistics.

### **Productivity**

#### I. **Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

USA offers somewhat worse than average value, ranked 12 among the countries we measure. Its workers are neither expensive nor inexpensive, taking into consideration USA's high levels of education and about average quality of education. Further, people in USA don't work hard relative to the cost of their labor - the average male of working age works 24 hours per week (14 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are somewhat low given USA's high per capita income levels, with investment at about 14% of GDP (14 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

USA's culture looks to be a support to growth in coming years because it is ranked 6 out of 20 countries in this culture gauge. Note that our culture measures compare USA to countries of similar levels of economic development. Starting with self-sufficiency, USA is rated pretty well on this measure, weighing that its workers have a somewhat weak work ethic, its level of government support is neutral (with government outlays at 40% of GDP), and its labor markets are very flexible. USA also seems to value achieving a bit more than savoring - again, its work ethic is somewhat weak, though surveys suggest that its people highly value accomplishment and achievement. Furthermore, innovation and commercialism are somewhat strong in USA relative to income. We see the country investing heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are high. Finally, according to the international measures we are using, USA has somewhat low bureaucracy and red tape, somewhat high corruption, and somewhat strong rule of law relative to its income.

### **Indebtedness**

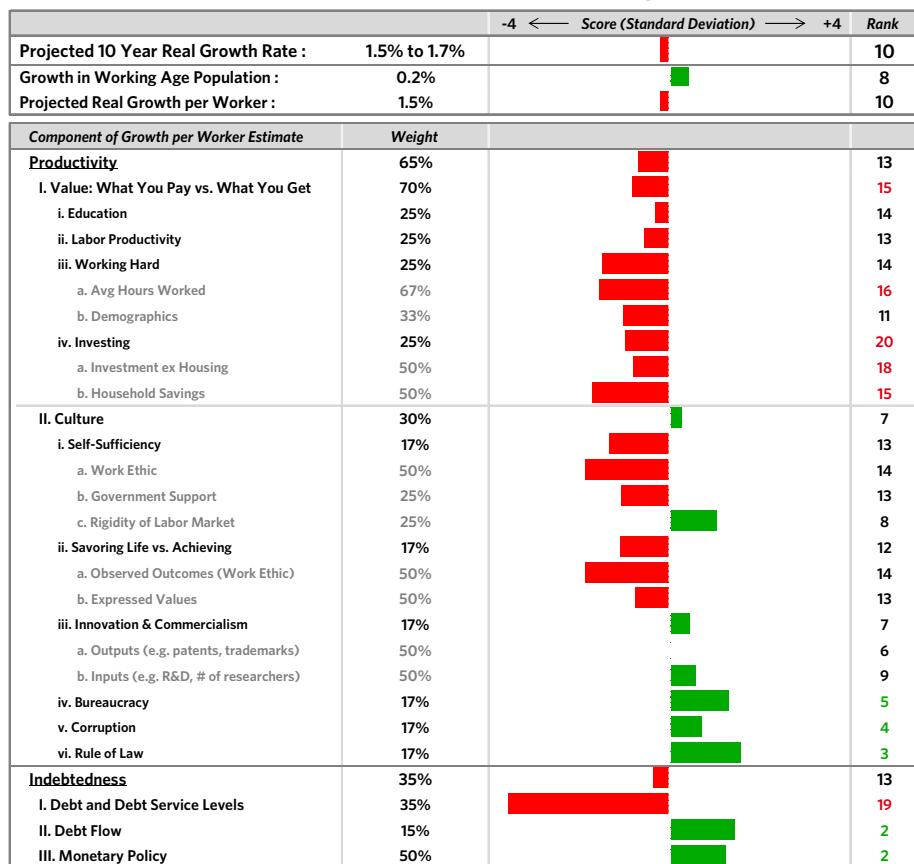
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. USA's indebtedness position is slightly better than other countries, ranked 6 out of the 20 countries we look at. The country has very little room to lever up in the future, with a total debt burden of around 312% of GDP, compared to the global average of 200-250%. In the past few years, its growth was depressed by low credit creation, which is supportive for growth going forward. Lastly, the stance of monetary policy is generally a bit stimulative.

## United Kingdom's Future Growth

Based on our economic health index, we project that UK's real growth rate over the next 10 years will be in the vicinity of 1.5% to 1.7%. This growth rate is roughly at the global average, ranked 10 out of 20 major economies, and 3 out of 11 developed countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In UK's case, our growth estimate comes from combining our expectation of a 1.5% growth rate per worker, which is roughly in line with the global average, and a labor force growth rate of 0.2%, which is somewhat above other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect UK's productivity to be somewhat worse than most major countries (implying a growth rate of 1.0% on its own), and indebtedness conditions to be slightly worse than other countries (implying a growth rate of 1.9% on its own). As shown below, UK's biggest relative strengths are its monetary policy and its low reliance on credit flows for growth, and its biggest relative problems are its debt and debt service levels and how hard its people work. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

**Economic Health Index: United Kingdom**



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

As mentioned, the descriptions below are based on influences which are conveyed in gauges that are made up of a composite of indicators, shown both in Part 1 and in the appendix. So, if you want to see why we are saying what we are saying, you can trace them through by looking at those statistics.

### **Productivity**

#### I. **Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

UK offers somewhat worse than average value, ranked 15 among the countries we measure. Its workers are neither expensive nor inexpensive, taking into consideration UK's about average levels of education and good quality of education. Further, people in UK don't work especially hard relative to the cost of their labor - the average male of working age works 23 hours per week (15 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are somewhat low given UK's high per capita income levels, with investment at about 13% of GDP (17 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

UK's culture looks to be neutral for growth in coming years because it is ranked 7 out of 20 countries in this culture gauge. Note that our culture measures compare UK to countries of similar levels of economic development. Starting with self-sufficiency, UK is rated pretty poorly on this measure, weighing that its workers have a weak work ethic, its level of government support is high (with government outlays at 45% of GDP), and its labor markets are moderately flexible. UK also seems to value savoring a bit more than achieving - again, its work ethic is weak, and surveys suggest that its people don't especially value accomplishment and achievement. Furthermore, innovation and commercialism are about average in UK relative to income. We see the country investing heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are about average. Finally, according to the international measures we are using, UK has somewhat low bureaucracy and red tape, somewhat low corruption, and very strong rule of law relative to its income.

### **Indebtedness**

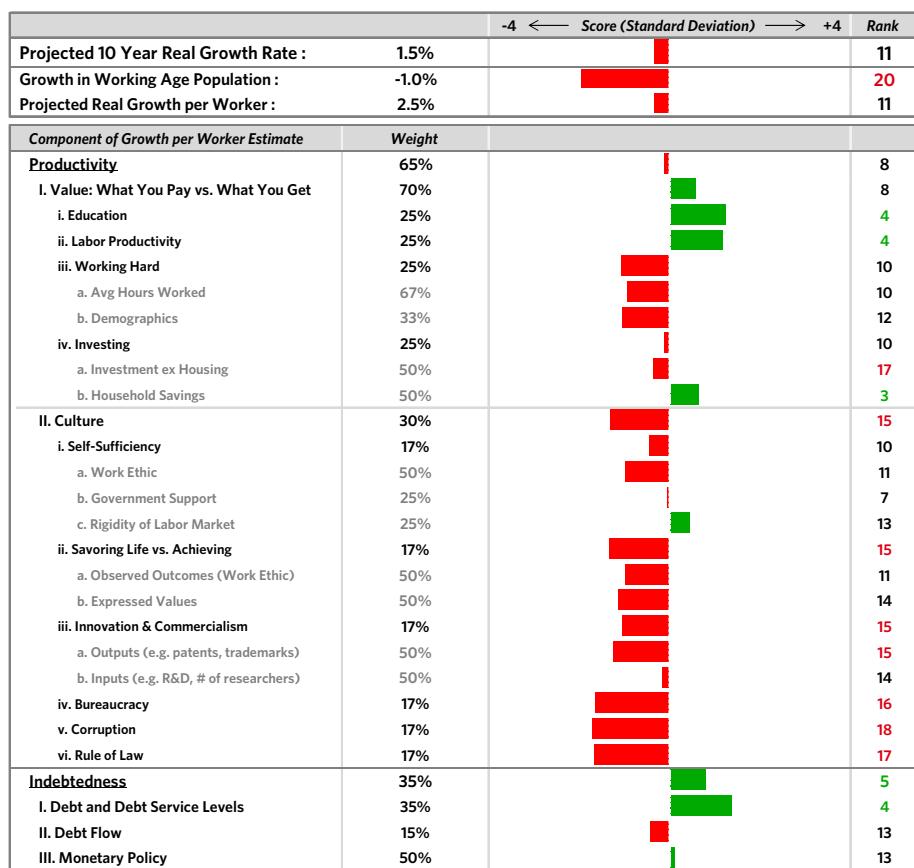
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. UK's indebtedness position is slightly worse than other countries, ranked 13 out of the 20 countries we look at. The country has very little room to lever up in the future, with a total debt burden of around 465% of GDP, compared to the global average of 200-250%. In the past few years, its growth was depressed by low credit creation, which is supportive for growth going forward. Lastly, the stance of monetary policy is generally a bit stimulative.

## Russia's Future Growth

Based on our economic health index, we project that Russia's real growth rate over the next 10 years will be in the vicinity of 1.5%. This growth rate is roughly at the global average, ranked 11 out of 20 major economies, and 8 out of 9 emerging countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Russia's case, our growth estimate comes from combining our expectation of a 2.5% growth rate per worker, which is roughly in line with the global average, and a labor force growth rate of -1.0%, which is well below other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Russia's productivity to be about average compared to most major countries (implying a growth rate of 1.8% on its own), and indebtedness conditions to be slightly better than other countries (implying a growth rate of 3.7% on its own). As shown below, Russia's biggest relative strengths are its debt and debt service levels and the value its workers provide relative to education levels, and its biggest relative problems are how hard its people work and its level of corruption relative to income. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

**Economic Health Index: Russia**



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

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### **Productivity**

#### I. **Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Russia offers somewhat better than average value, ranked 8 among the countries we measure. Its workers are somewhat inexpensive, taking into consideration Russia's high levels of education and poor quality of education. Further, people in Russia don't work especially hard relative to the cost of their labor - the average male of working age works 25 hours per week (11 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are roughly average given Russia's about average per capita income levels, with investment at about 13% of GDP (19 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Russia's culture looks to be a headwind to growth in coming years because it is ranked 15 out of 20 countries in this culture gauge. Note that our culture measures compare Russia to countries of similar levels of economic development. Starting with self-sufficiency, Russia is rated about average on this measure, weighing that its workers have a somewhat weak work ethic, its level of government support is neutral (with government outlays at 38% of GDP), and its labor markets are neither rigid nor flexible. Russia also seems to value savoring a bit more than achieving - again, its work ethic is somewhat weak, and surveys suggest that its people don't especially value accomplishment and achievement. Furthermore, innovation and commercialism are somewhat weak in Russia relative to income. We see the country investing neither lightly nor heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are low. Finally, according to the international measures we are using, Russia has very high bureaucracy and red tape, very high corruption, and very weak rule of law relative to its income.

### **Indebtedness**

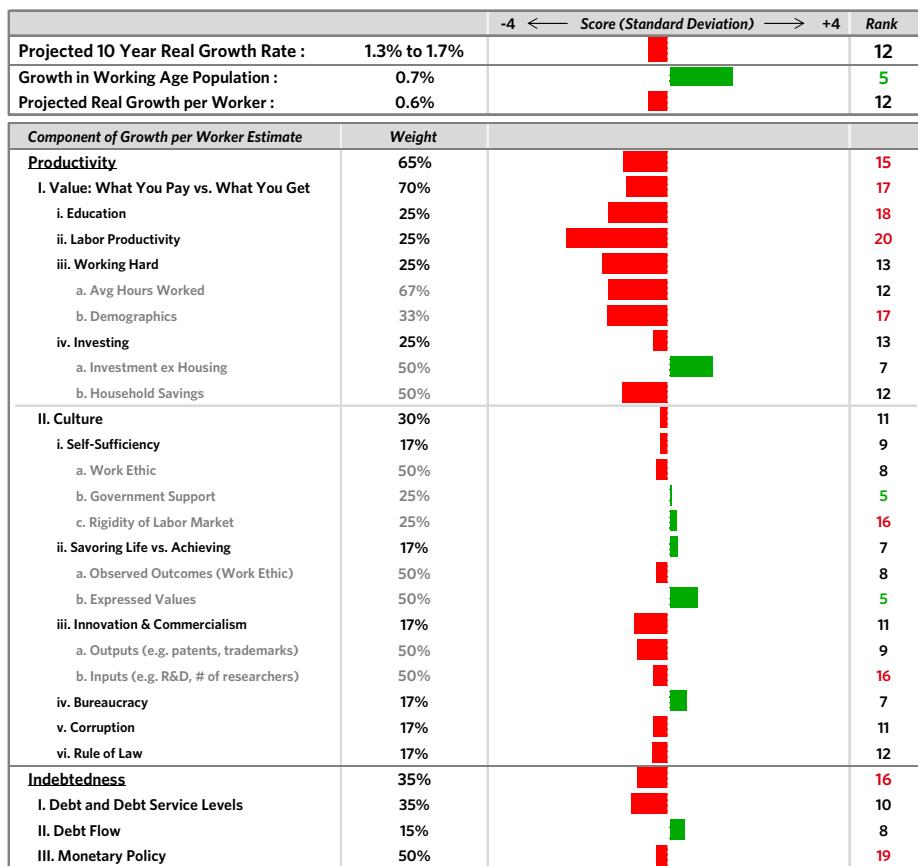
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Russia's indebtedness position is slightly better than other countries, ranked 5 out of the 20 countries we look at. The country has a moderate amount of room to lever up in the future, with a total debt burden of around 84% of GDP, compared to the global average of 200-250%. In the past few years, its growth was neither supported nor depressed by credit creation, which is neutral for growth going forward. Lastly, the stance of monetary policy is generally neutral.

## Australia's Future Growth

Based on our economic health index, we project that Australia's real growth rate over the next 10 years will be in the vicinity of 1.3% to 1.7%. This growth rate is roughly at the global average, ranked 12 out of 20 major economies, and 4 out of 11 developed countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Australia's case, our growth estimate comes from combining our expectation of a 0.6% growth rate per worker, which is roughly in line with the global average, and a labor force growth rate of 0.7%, which is somewhat above other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Australia's productivity to be somewhat worse than most major countries (implying a growth rate of 0.5% on its own), and indebtedness conditions to be slightly worse than other countries (implying a growth rate of 1.8% on its own). As shown below, Australia's biggest relative strengths are its low reliance on credit flows for growth and its level of bureaucracy (though compared to other countries it doesn't rate especially well on these measures), and its biggest relative problems are the value its workers provide relative to education levels and how hard its people work. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Australia



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

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### **Productivity**

#### I. **Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Australia offers somewhat worse than average value, ranked 17 among the countries we measure. Its workers are very expensive, even taking into consideration Australia's somewhat high levels of education and good quality of education. Further, people in Australia don't work especially hard relative to the cost of their labor - the average male of working age works 27 hours per week (10 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are roughly average given Australia's very high per capita income levels, with investment at about 26% of GDP (3 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Australia's culture looks to be neutral for growth in coming years because it is ranked 11 out of 20 countries in this culture gauge. Note that our culture measures compare Australia to countries of similar levels of economic development. Starting with self-sufficiency, Australia is rated about average on this measure, weighing that its workers have a roughly average work ethic, its level of government support is neutral (with government outlays at 37% of GDP), and its labor markets are neither rigid nor flexible. Australia also seems to value savoring about the same as it values achieving - again, its work ethic is roughly average, and surveys suggest that its people value accomplishment and achievement. Furthermore, innovation and commercialism are somewhat weak in Australia relative to income. We see the country investing neither lightly nor heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are low. Finally, according to the international measures we are using, Australia has average levels of bureaucracy and red tape, average levels of corruption, and average rule of law relative to its income.

### **Indebtedness**

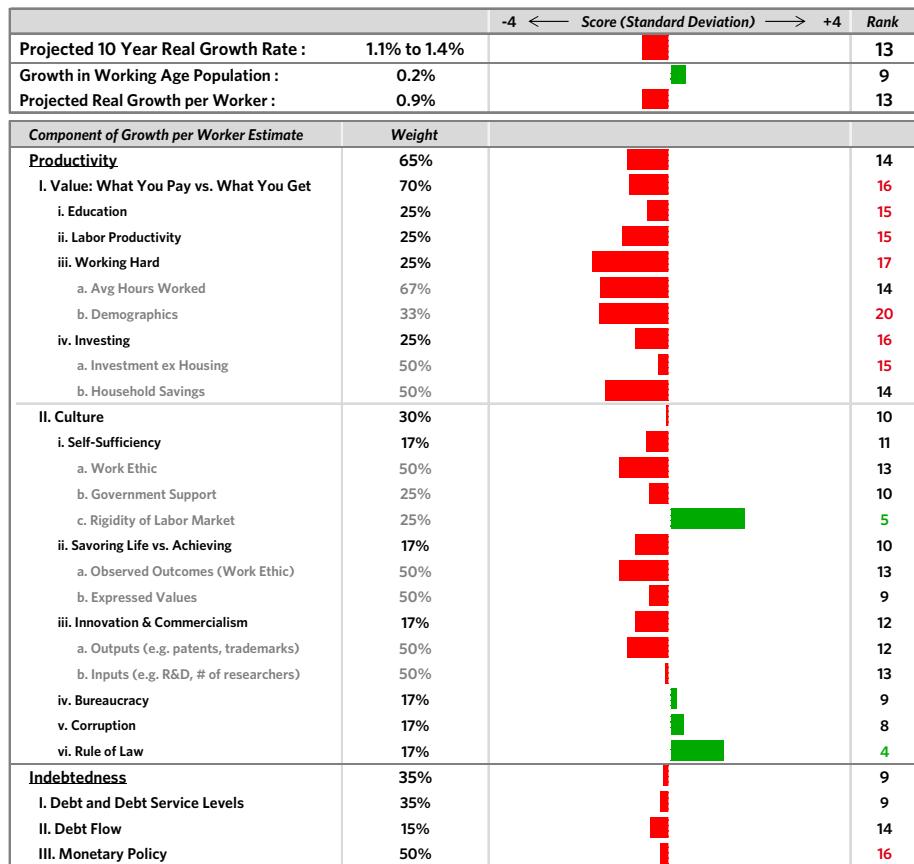
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Australia's indebtedness position is slightly worse than other countries, ranked 16 out of the 20 countries we look at. The country has little room to lever up in the future, with a total debt burden of around 300% of GDP, compared to the global average of 200-250%. In the past few years, its growth was neither supported nor depressed by credit creation, which is neutral for growth going forward. Lastly, the stance of monetary policy is generally neutral.

## Canada's Future Growth

Based on our economic health index, we project that Canada's real growth rate over the next 10 years will be in the vicinity of 1.1% to 1.4%. This growth rate is somewhat below the global average, ranked 13 out of 20 major economies, and 5 out of 11 developed countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Canada's case, our growth estimate comes from combining our expectation of a 0.9% growth rate per worker, which is somewhat below the global average, and a labor force growth rate of 0.2%, which is roughly in line with other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Canada's productivity to be somewhat worse than most major countries (implying a growth rate of 0.6% on its own), and indebtedness conditions to be about average compared to other countries (implying a growth rate of 2.4% on its own). As shown below, Canada's biggest relative strengths are its rule of law and its level of corruption relative to income, and its biggest relative problems are how hard its people work and the value its workers provide relative to education levels. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

**Economic Health Index: Canada**



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

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### **Productivity**

#### I. **Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Canada offers somewhat worse than average value, ranked 16 among the countries we measure. Its workers are somewhat expensive, even taking into consideration Canada's somewhat high levels of education and very good quality of education. Further, people in Canada don't work hard relative to the cost of their labor - the average male of working age works 24 hours per week (13 out of 20 countries), and the demographics of the workforce are very unfavorable. Levels of saving and investing are somewhat low given Canada's high per capita income levels, with investment at about 18% of GDP (7 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Canada's culture looks to be neutral for growth in coming years because it is ranked 10 out of 20 countries in this culture gauge. Note that our culture measures compare Canada to countries of similar levels of economic development. Starting with self-sufficiency, Canada is rated about average on this measure, weighing that its workers have a somewhat weak work ethic, its level of government support is neutral (with government outlays at 46% of GDP), and its labor markets are very flexible. Canada also seems to value savoring a bit more than achieving - again, its work ethic is somewhat weak, and surveys suggest that its people moderately value accomplishment and achievement. Furthermore, innovation and commercialism are somewhat weak in Canada relative to income. We see the country investing neither lightly nor heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are low. Finally, according to the international measures we are using, Canada has average levels of bureaucracy and red tape, average levels of corruption, and somewhat strong rule of law relative to its income.

### **Indebtedness**

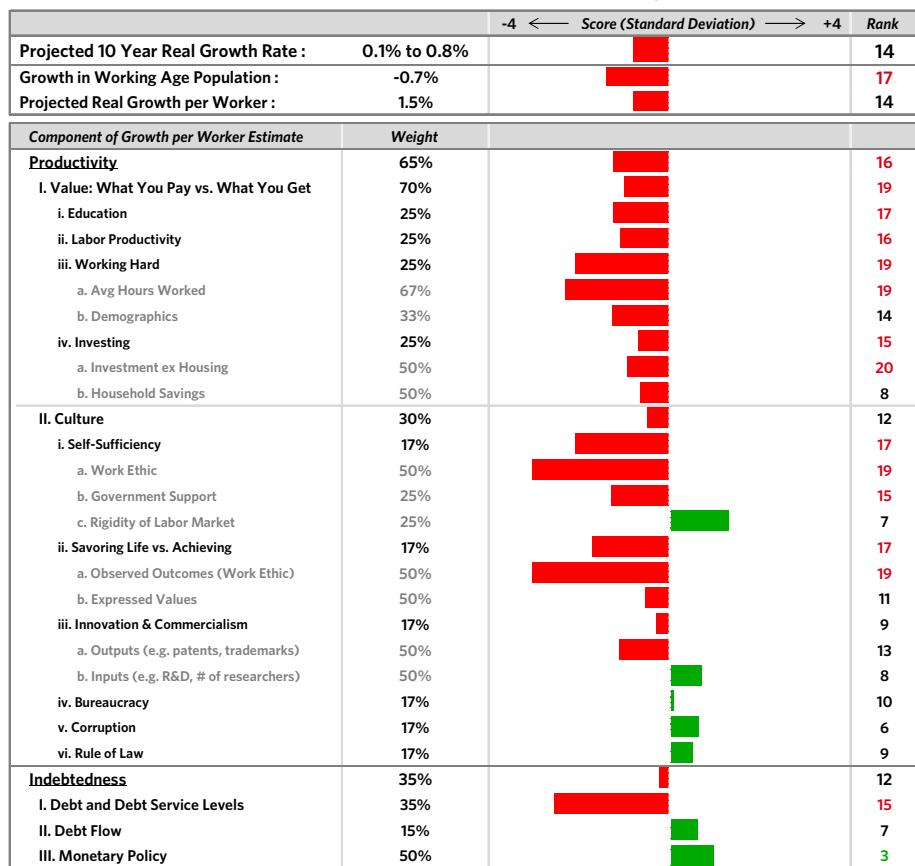
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Canada's indebtedness position is about average compared to other countries, ranked 9 out of the 20 countries we look at. The country has a bit of room to lever up in the future, with a total debt burden of around 274% of GDP, compared to the global average of 200-250%. In the past few years, its growth was neither supported nor depressed by credit creation, which is neutral for growth going forward. Lastly, the stance of monetary policy is generally neutral.

## Germany's Future Growth

Based on our economic health index, we project that Germany's real growth rate over the next 10 years will be in the vicinity of 0.1% to 0.8%. This growth rate is somewhat below the global average, ranked 14 out of 20 major economies, and 6 out of 11 developed countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Germany's case, our growth estimate comes from combining our expectation of a 1.5% growth rate per worker, which is somewhat below the global average, and a labor force growth rate of -0.7%, which is well below other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Germany's productivity to be somewhat worse than most major countries (implying a growth rate of 0.1% on its own), and indebtedness conditions to be about average compared to other countries (implying a growth rate of 2.1% on its own). As shown below, Germany's biggest relative strengths are its monetary policy and its low reliance on credit flows for growth, and its biggest relative problems are its debt and debt service levels and how hard its people work. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

**Economic Health Index: Germany**



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

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### **Productivity**

#### I. **Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Germany offers somewhat worse than average value, ranked 19 among the countries we measure. Its workers are somewhat expensive, taking into consideration Germany's about average levels of education and good quality of education. Further, people in Germany don't work hard relative to the cost of their labor - the average male of working age works 18 hours per week (19 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are somewhat low given Germany's high per capita income levels, with investment at about 13% of GDP (18 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Germany's culture looks to be neutral for growth in coming years because it is ranked 12 out of 20 countries in this culture gauge. Note that our culture measures compare Germany to countries of similar levels of economic development. Starting with self-sufficiency, Germany is rated pretty poorly on this measure, weighing that its workers have a weak work ethic, its level of government support is high (with government outlays at 46% of GDP), and its labor markets are moderately flexible. Germany also seems to value savoring much more than achieving - again, its work ethic is weak, and surveys suggest that its people don't especially value accomplishment and achievement. Furthermore, innovation and commercialism are about average in Germany relative to income. We see the country investing heavily in research and innovation, though its outputs from innovation, including inventions and earnings, are low. Finally, according to the international measures we are using, Germany has average levels of bureaucracy and red tape, somewhat low corruption, and somewhat strong rule of law relative to its income.

### **Indebtedness**

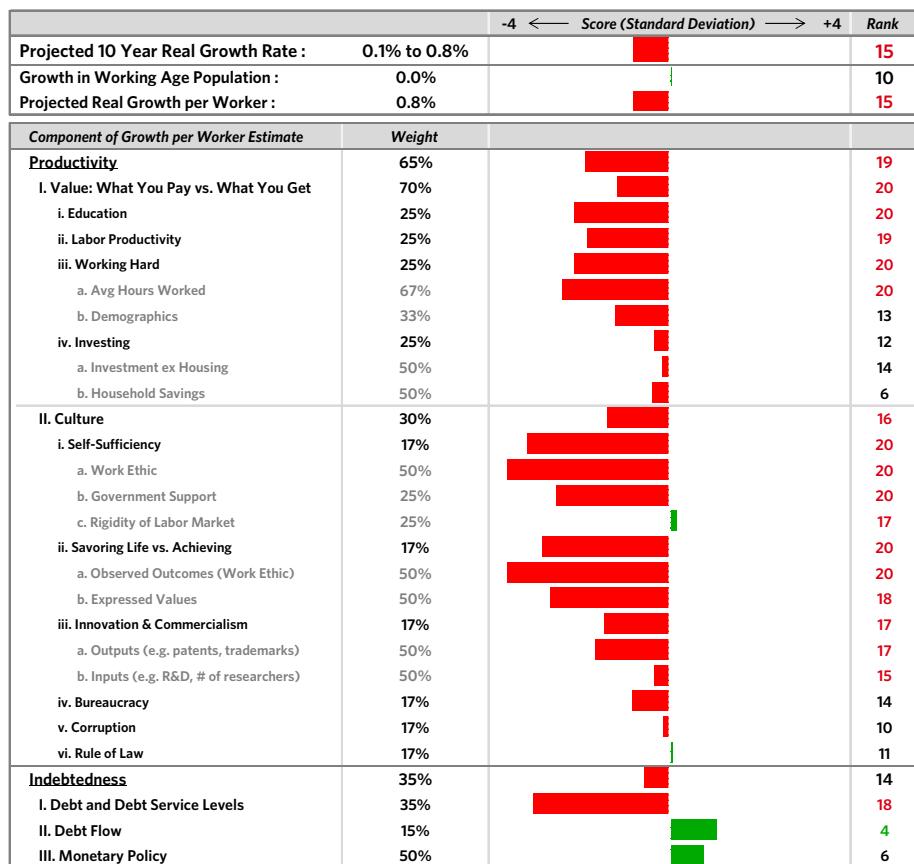
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Germany's indebtedness position is about average compared to other countries, ranked 12 out of the 20 countries we look at. The country has very little room to lever up in the future, with a total debt burden of around 262% of GDP, compared to the global average of 200-250%. In the past few years, its growth was depressed by low credit creation, which is supportive for growth going forward. Lastly, the stance of monetary policy is generally a bit stimulative.

## France's Future Growth

Based on our economic health index, we project that France's real growth rate over the next 10 years will be in the vicinity of 0.1% to 0.8%. This growth rate is somewhat below the global average, ranked 15 out of 20 major economies, and 7 out of 11 developed countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In France's case, our growth estimate comes from combining our expectation of a 0.8% growth rate per worker, which is somewhat below the global average, and a labor force growth rate of 0.0%, which is roughly in line with other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect France's productivity to be much worse than most major countries (implying a growth rate of -0.8% on its own), and indebtedness conditions to be slightly worse than other countries (implying a growth rate of 1.8% on its own). As shown below, France's biggest relative strengths are its monetary policy and its low reliance on credit flows for growth, and its biggest relative problems are its debt and debt service levels and how hard its people work. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

**Economic Health Index: France**



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

As mentioned, the descriptions below are based on influences which are conveyed in gauges that are made up of a composite of indicators, shown both in Part 1 and in the appendix. So, if you want to see why we are saying what we are saying, you can trace them through by looking at those statistics.

### **Productivity**

#### I. **Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

France offers somewhat worse than average value, ranked 20 among the countries we measure. Its workers are very expensive, taking into consideration France's somewhat low levels of education and good quality of education. Further, people in France don't work hard relative to the cost of their labor - the average male of working age works 17 hours per week (20 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are roughly average given France's high per capita income levels, with investment at about 17% of GDP (8 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

France's culture looks to be a headwind to growth in coming years because it is ranked 16 out of 20 countries in this culture gauge. Note that our culture measures compare France to countries of similar levels of economic development. Starting with self-sufficiency, France is rated very poorly on this measure, weighing that its workers have a weak work ethic, its level of government support is very high (with government outlays at 57% of GDP), and its labor markets are neither rigid nor flexible. France also seems to value savoring much more than achieving - again, its work ethic is weak, and surveys suggest that its people don't value accomplishment and achievement. Furthermore, innovation and commercialism are somewhat weak in France relative to income. We see the country investing neither lightly nor heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are very low. Finally, according to the international measures we are using, France has somewhat high bureaucracy and red tape, average levels of corruption, and average rule of law relative to its income.

### **Indebtedness**

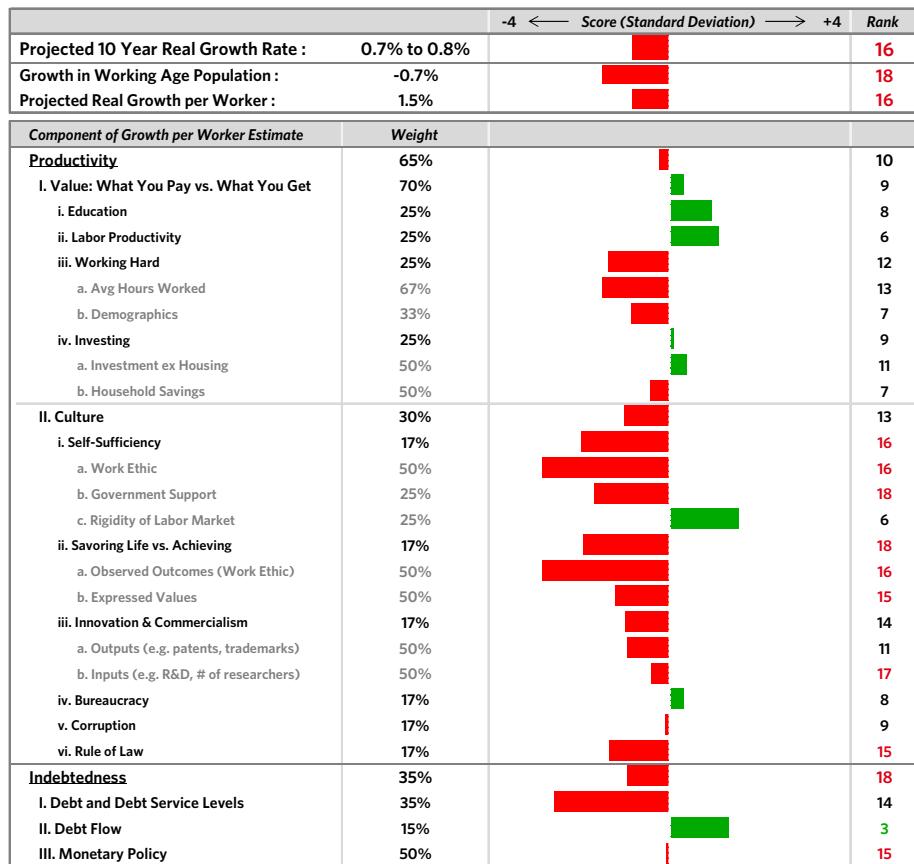
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. France's indebtedness position is slightly worse than other countries, ranked 14 out of the 20 countries we look at. The country has very little room to lever up in the future, with a total debt burden of around 320% of GDP, compared to the global average of 200-250%. In the past few years, its growth was depressed by low credit creation, which is supportive for growth going forward. Lastly, the stance of monetary policy is generally a bit stimulative.

## Hungary's Future Growth

Based on our economic health index, we project that Hungary's real growth rate over the next 10 years will be in the vicinity of 0.7% to 0.8%. This growth rate is somewhat below the global average, ranked 16 out of 20 major economies, and 9 out of 9 emerging countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Hungary's case, our growth estimate comes from combining our expectation of a 1.5% growth rate per worker, which is somewhat below the global average, and a labor force growth rate of -0.7%, which is well below other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Hungary's productivity to be about average compared to most major countries (implying a growth rate of 1.7% on its own), and indebtedness conditions to be worse than other countries (implying a growth rate of 1.1% on its own). As shown below, Hungary's biggest relative strengths are the value its workers provide relative to education levels and its low reliance on credit flows for growth, and its biggest relative problems are its debt and debt service levels and how hard its people work. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

**Economic Health Index: Hungary**



Scores shown as number of standard deviations away from the average observation across countries and time.

## More Detail

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### *Productivity*

#### I. *Value: What You Pay Versus What You Get*

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Hungary offers around average value, ranked 9 among the countries we measure. Its workers are somewhat inexpensive, taking into consideration Hungary's about average levels of education and poor quality of education. Further, people in Hungary don't work especially hard relative to the cost of their labor - the average male of working age works 21 hours per week (16 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are roughly average given Hungary's about average per capita income levels, with investment at about 15% of GDP (11 out of 20 countries).

#### II. *Culture*

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Hungary's culture looks to be a headwind to growth in coming years because it is ranked 13 out of 20 countries in this culture gauge. Note that our culture measures compare Hungary to countries of similar levels of economic development. Starting with self-sufficiency, Hungary is rated pretty poorly on this measure, weighing that its workers have a weak work ethic, its level of government support is very high (with government outlays at 50% of GDP), and its labor markets are very flexible. Hungary also seems to value savoring much more than achieving - again, its work ethic is weak, and surveys suggest that its people don't especially value accomplishment and achievement. Furthermore, innovation and commercialism are somewhat weak in Hungary relative to income. We see the country investing neither lightly nor heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are low. Finally, according to the international measures we are using, Hungary has average levels of bureaucracy and red tape, average levels of corruption, and somewhat weak rule of law relative to its income.

### *Indebtedness*

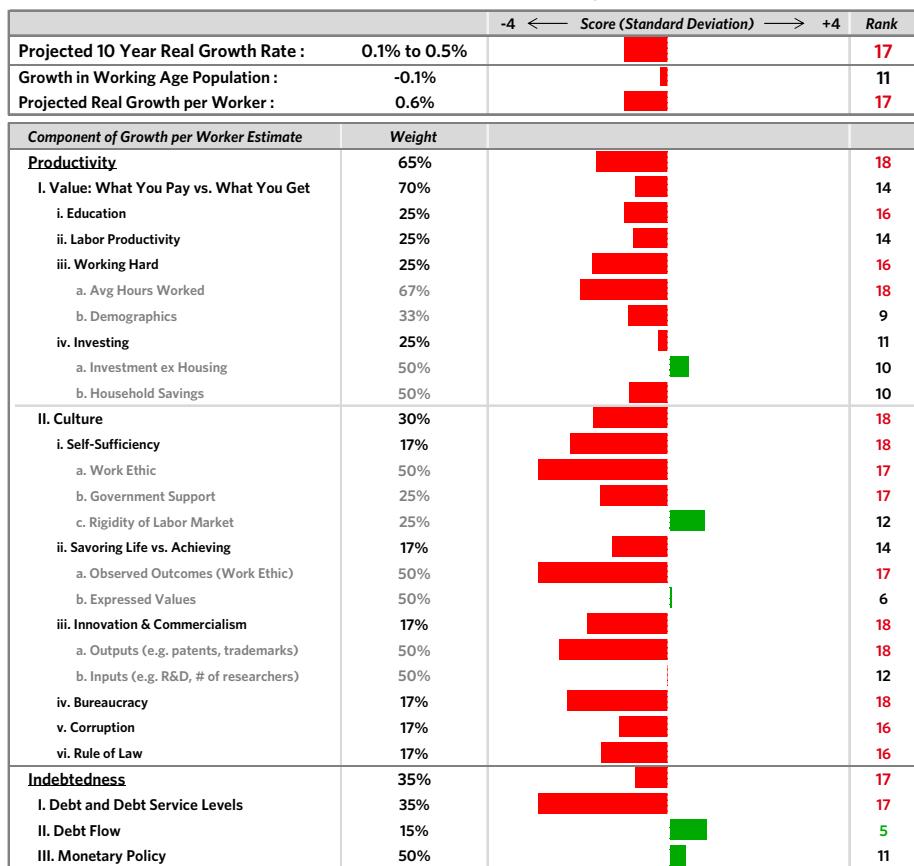
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Hungary's indebtedness position is worse than other countries, ranked 18 out of the 20 countries we look at. The country has very little room to lever up in the future, with a total debt burden of around 193% of GDP, compared to the global average of 200-250%. In the past few years, its growth was depressed by low credit creation, which is supportive for growth going forward. Lastly, the stance of monetary policy is generally neutral.

## Spain's Future Growth

Based on our economic health index, we project that Spain's real growth rate over the next 10 years will be in the vicinity of 0.1% to 0.5%. This growth rate is somewhat below the global average, ranked 17 out of 20 major economies, and 8 out of 11 developed countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Spain's case, our growth estimate comes from combining our expectation of a 0.6% growth rate per worker, which is well below the global average, and a labor force growth rate of -0.1%, which is roughly in line with other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Spain's productivity to be much worse than most major countries (implying a growth rate of -0.4% on its own), and indebtedness conditions to be worse than other countries (implying a growth rate of 1.4% on its own). As shown below, Spain's biggest relative strengths are its monetary policy and its low reliance on credit flows for growth, and its biggest relative problems are its debt and debt service levels and how hard its people work. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Spain



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

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### **Productivity**

#### I. **Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Spain offers somewhat worse than average value, ranked 14 among the countries we measure. Its workers are somewhat expensive, taking into consideration Spain's about average levels of education and about average quality of education. Further, people in Spain don't work hard relative to the cost of their labor - the average male of working age works 20 hours per week (18 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are roughly average given Spain's high per capita income levels, with investment at about 16% of GDP (10 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Spain's culture looks to be a significant headwind to growth in coming years because it is ranked 18 out of 20 countries in this culture gauge. Note that our culture measures compare Spain to countries of similar levels of economic development. Starting with self-sufficiency, Spain is rated pretty poorly on this measure, weighing that its workers have a weak work ethic, its level of government support is very high (with government outlays at 46% of GDP), and its labor markets are moderately flexible. Spain also seems to value savoring a bit more than achieving - again, its work ethic is weak, and surveys suggest that its people moderately value accomplishment and achievement. Furthermore, innovation and commercialism are somewhat weak in Spain relative to income. We see the country investing neither lightly nor heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are very low. Finally, according to the international measures we are using, Spain has very high bureaucracy and red tape, somewhat high corruption, and somewhat weak rule of law relative to its income.

### **Indebtedness**

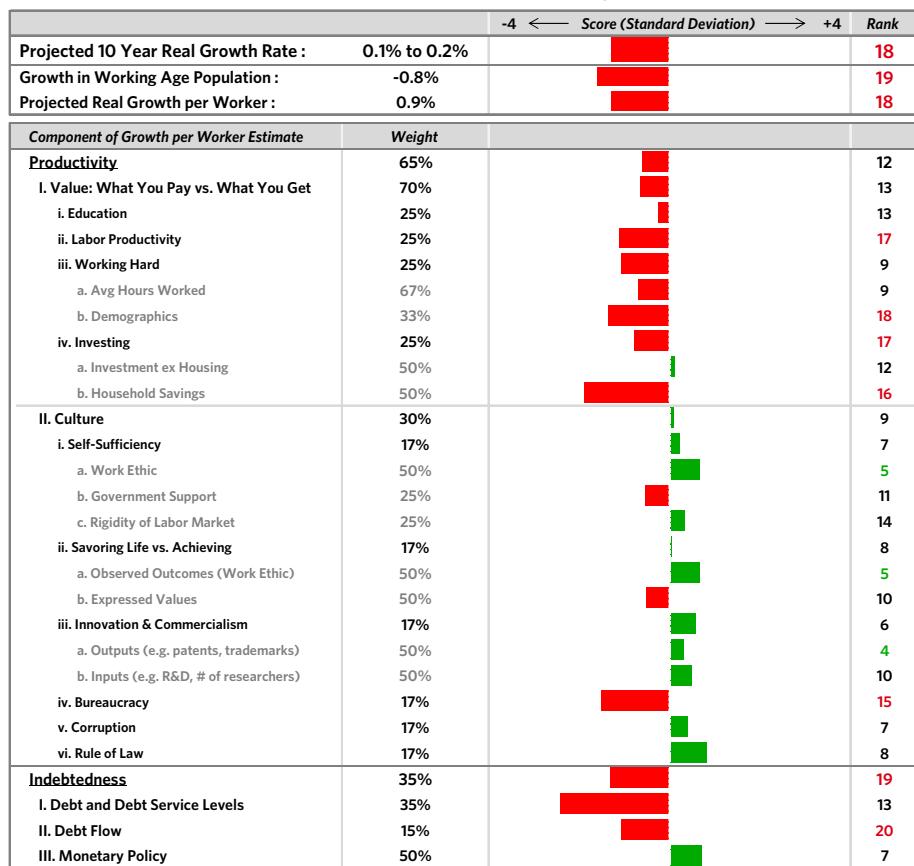
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Spain's indebtedness position is worse than other countries, ranked 17 out of the 20 countries we look at. The country has very little room to lever up in the future, with a total debt burden of around 378% of GDP, compared to the global average of 200-250%. In the past few years, its growth was depressed by low credit creation, which is supportive for growth going forward. Lastly, the stance of monetary policy is generally neutral.

## Japan's Future Growth

Based on our economic health index, we project that Japan's real growth rate over the next 10 years will be in the vicinity of 0.1% to 0.2%. This growth rate is well below the global average, ranked 18 out of 20 major economies, and 9 out of 11 developed countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Japan's case, our growth estimate comes from combining our expectation of a 0.9% growth rate per worker, which is well below the global average, and a labor force growth rate of -0.8%, which is well below other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Japan's productivity to be somewhat worse than most major countries (implying a growth rate of 1.1% on its own), and indebtedness conditions to be worse than other countries (implying a growth rate of 0.7% on its own). As shown below, Japan's biggest relative strengths are its monetary policy and its rule of law, and its biggest relative problems are its debt and debt service levels and its aging workforce. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

**Economic Health Index: Japan**



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

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### **Productivity**

#### I. **Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Japan offers somewhat worse than average value, ranked 13 among the countries we measure. Its workers are somewhat expensive, even taking into consideration Japan's somewhat high levels of education and very good quality of education. Further, people in Japan don't work especially hard relative to the cost of their labor - the average male of working age works 31 hours per week (6 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are somewhat low given Japan's high per capita income levels, with investment at about 19% of GDP (5 out of 20 countries).

#### II. **Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Japan's culture looks to be neutral for growth in coming years because it is ranked 9 out of 20 countries in this culture gauge. Note that our culture measures compare Japan to countries of similar levels of economic development. Starting with self-sufficiency, Japan is rated about average on this measure, weighing that its workers have a somewhat strong work ethic, its level of government support is high (with government outlays at 40% of GDP), and its labor markets are neither rigid nor flexible. Japan also seems to value savoring about the same as it values achieving - again, its work ethic is somewhat strong, though surveys suggest that its people don't especially value accomplishment and achievement. Furthermore, innovation and commercialism are about average in Japan relative to income. We see the country investing neither lightly nor heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are about average. Finally, according to the international measures we are using, Japan has very high bureaucracy and red tape, average levels of corruption, and somewhat strong rule of law relative to its income.

### **Indebtedness**

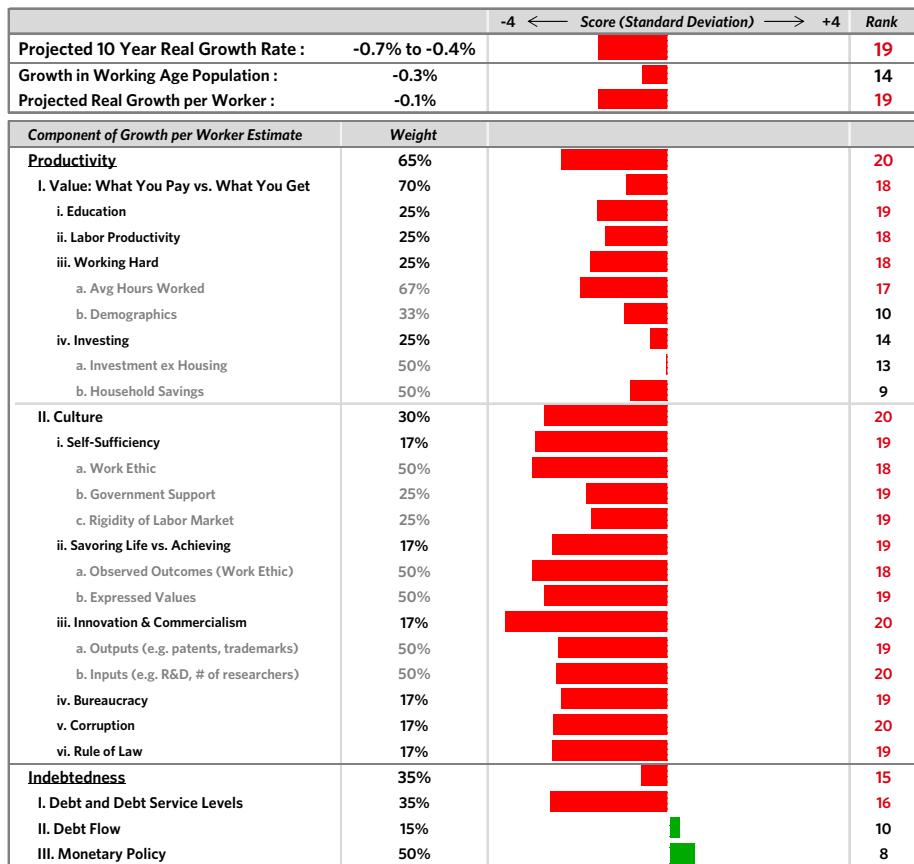
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Japan's indebtedness position is worse than other countries, ranked 19 out of the 20 countries we look at. The country has very little room to lever up in the future, with a total debt burden of around 449% of GDP, compared to the global average of 200-250%. In the past few years, its growth was supported by high credit creation, which is restrictive for growth going forward. Lastly, the stance of monetary policy is generally stimulative.

## Italy's Future Growth

Based on our economic health index, we project that Italy's real growth rate over the next 10 years will be in the vicinity of -0.7% to -0.4%. This growth rate is well below the global average, ranked 19 out of 20 major economies, and 10 out of 11 developed countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Italy's case, our growth estimate comes from combining our expectation of a -0.1% growth rate per worker, which is well below the global average, and a labor force growth rate of -0.3%, which is somewhat below other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Italy's productivity to be much worse than most major countries (implying a growth rate of -1.6% on its own), and indebtedness conditions to be slightly worse than other countries (implying a growth rate of 1.7% on its own). As shown below, Italy's biggest relative strengths are its monetary policy and its low reliance on credit flows for growth (though compared to other countries it doesn't rate especially well on these measures), and its biggest relative problems are its debt and debt service levels and how hard its people work. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Italy



Scores shown as number of standard deviations away from the average observation across countries and time.

## More Detail

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### *Productivity*

#### I. *Value: What You Pay Versus What You Get*

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Italy offers somewhat worse than average value, ranked 18 among the countries we measure. Its workers are somewhat expensive, taking into consideration Italy's somewhat low levels of education and about average quality of education. Further, people in Italy don't work hard relative to the cost of their labor - the average male of working age works 20 hours per week (17 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are roughly average given Italy's high per capita income levels, with investment at about 15% of GDP (13 out of 20 countries).

#### II. *Culture*

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Italy's culture looks to be a significant headwind to growth in coming years because it is ranked 20 out of 20 countries in this culture gauge. Note that our culture measures compare Italy to countries of similar levels of economic development. Starting with self-sufficiency, Italy is rated very poorly on this measure, weighing that its workers have a weak work ethic, its level of government support is very high (with government outlays at 51% of GDP), and its labor markets are very rigid. Italy also seems to value savoring much more than achieving - again, its work ethic is weak, and surveys suggest that its people don't value accomplishment and achievement. Furthermore, innovation and commercialism are very weak in Italy relative to income. We see the country investing very lightly in research and innovation, and its outputs from innovation, including inventions and earnings, are very low. Finally, according to the international measures we are using, Italy has very high bureaucracy and red tape, very high corruption, and very weak rule of law relative to its income.

### *Indebtedness*

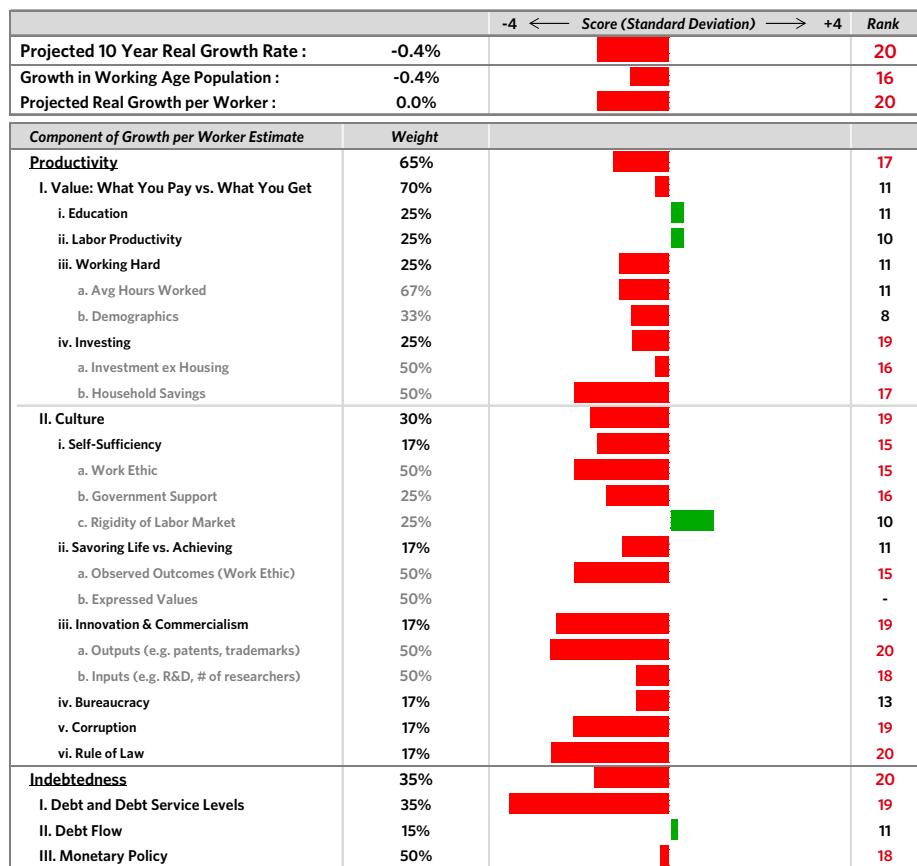
*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Italy's indebtedness position is slightly worse than other countries, ranked 15 out of the 20 countries we look at. The country has very little room to lever up in the future, with a total debt burden of around 341% of GDP, compared to the global average of 200-250%. In the past few years, its growth was neither supported nor depressed by credit creation, which is neutral for growth going forward. Lastly, the stance of monetary policy is generally a bit stimulative.

## Greece's Future Growth

Based on our economic health index, we project that Greece's real growth rate over the next 10 years will be in the vicinity of -0.4%. This growth rate is well below the global average, ranked 20 out of 20 major economies, and 11 out of 11 developed countries. As a reminder, this estimate (and this writing) is based on our computer-generated analysis of the statistics detailed in Part 1, and doesn't account for exogenous shocks (like commodity or political shocks, or wars). In Greece's case, our growth estimate comes from combining our expectation of a 0.0% growth rate per worker, which is well below the global average, and a labor force growth rate of -0.4%, which is somewhat below other major economies. The growth in output per worker is driven significantly by productivity and indebtedness. Over the long-term productivity matters most, while swings in indebtedness tend to be an important driver in the short-term. Given we are looking at a 10 year time frame, we weigh our productivity measures about two thirds and our indebtedness measure about one third (though there is no precision here). Over the next 10 years, we expect Greece's productivity to be somewhat worse than most major countries (implying a growth rate of 0.1% on its own), and indebtedness conditions to be worse than other countries (implying a growth rate of 0.0% on its own). As shown below, Greece's biggest relative strengths are the value its workers provide relative to education levels and its low reliance on credit flows for growth (though compared to other countries it doesn't rate especially well on these measures), and its biggest relative problems are its debt and debt service levels and how hard its people work. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this section, and listed in the appendix of this section. Please review this table to understand our comments.

**Economic Health Index: Greece**



Scores shown as number of standard deviations away from the average observation across countries and time.

## **More Detail**

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### **Productivity**

#### **I. Value: What You Pay Versus What You Get**

*A country's productivity and competitiveness is mostly a function of the relative value it offers, especially for its labor. As shorthand for this, we refer to our gauge of this relative value as "what you pay versus what you get"; it reflects a) the cost and value of employees and b) the levels of investment. Countries that have well-educated workers that are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Greece offers around average value, ranked 11 among the countries we measure. Its workers are neither expensive nor inexpensive, taking into consideration Greece's somewhat high levels of education and poor quality of education. Further, people in Greece don't work especially hard relative to the cost of their labor - the average male of working age works 25 hours per week (12 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are somewhat low given Greece's about average per capita income levels, with investment at about 9% of GDP (20 out of 20 countries).

#### **II. Culture**

*Just looking solely at the relative value of a country's workers misses the role that the culture plays in determining how much a country will grow. As I've discussed, culture influences the decisions people make about factors like savings rates or how many hours they work each week, which we measure in the previously shown indicators, but culture can also influence work attitudes, levels of efficiency, reliability and other such influences on whether countries underperform or outperform.*

Greece's culture looks to be a significant headwind to growth in coming years because it is ranked 19 out of 20 countries in this culture gauge. Note that our culture measures compare Greece to countries of similar levels of economic development. Starting with self-sufficiency, Greece is rated pretty poorly on this measure, weighing that its workers have a weak work ethic, its level of government support is high (with government outlays at 51% of GDP), and its labor markets are moderately flexible. Greece also seems to value savoring a bit more than achieving - again, its work ethic is weak, and surveys suggest that its people moderately value accomplishment and achievement. Furthermore, innovation and commercialism are very weak in Greece relative to income. We see the country investing lightly in research and innovation, and its outputs from innovation, including inventions and earnings, are very low. Finally, according to the international measures we are using, Greece has somewhat high bureaucracy and red tape, very high corruption, and very weak rule of law relative to its income.

### **Indebtedness**

*Think of debt growth that is faster than income growth as being like air in a scuba bottle-there is a limited amount of it that you can use to get an extra boost, but you can't live on it forever. When you are taking it out, you can spend more than is sustainable, but when debts can no longer be raised relative to incomes and the time for paying back comes, the process works in reverse. You can get a picture of where countries stand in the long-term debt cycle and the likelihood of debt being a support or detriment to future growth by assessing the past reliance on debt to support incomes and the attractiveness of taking on new debt.*

The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Greece's indebtedness position is worse than other countries, ranked 20 out of the 20 countries we look at. The country has very little room to lever up in the future, with a total debt burden of around 320% of GDP, compared to the global average of 200-250%. In the past few years, its growth was neither supported nor depressed by credit creation, which is neutral for growth going forward. Lastly, the stance of monetary policy is generally neutral.

## Appendix: List of Statistics that Make Up Our Gauges

Below, we share all of the individual indicators that make up our productivity gauges, showing the most recent reading for each country. Countries that score best on the measure appear on the left, and countries that score worst are on the right. For further discussion of these concepts and gauges, see Part 1. Regrettably, we can't share the statistics underlying our proprietary indebtedness gauges.

### Productivity - Value

Best ← → Worst

#### i. Education

##### Cost of a Quality Adjusted Educated Worker

| Country   | IN   | CN   | TH   | RU   | MX   | KR   | BR   | HU   | AR   | SG   | GR   | US   | JP  | GB  | CA   | ES  | DE  | AU   | IT  | FR   |
|---|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|------|-----|-----|------|-----|------|
| Cost of a Quality Adjusted Educated Worker rel. to the US | -93% | -86% | -82% | -70% | -64% | -57% | -54% | -53% | -45% | -26% | -18% | 0%   | 10% | 13% | 24%  | 51% | 64% | 70%  | 83% | 112% |
| Education Quality Relative to the US                      | -44% | 2%   | -21% | -1%  | -22% | 13%  | -27% | -2%  | -27% | 19%  | -7%  | 0%   | 15% | 3%  | 10%  | 0%  | 7%  | 3%   | 0%  | 3%   |
| % of Working Age Pop - Attained at least Primary School   | 65%  | 86%  | 75%  | 97%  | 80%  | 96%  | 80%  | 100% | 92%  | 82%  | 94%  | 99%  | 97% | 97% | 89%  | 97% | 97% | 93%  | 97% | 97%  |
| % of Working Age Pop - Attained at Least Secondary School | 34%  | 55%  | 32%  | 83%  | 36%  | 77%  | 36%  | 70%  | 42%  | 68%  | 54%  | 90%  | 72% | 73% | 76%  | 44% | 76% | 69%  | 46% | 61%  |
| % of Working Age Pop - Attained at Least Tertiary School  | 5%   | 3%   | 10%  | 25%  | 10%  | 30%  | 6%   | 15%  | 3%   | 30%  | 23%  | 27%  | 19% | 15% | 23%  | 15% | 13% | 19%  | 7%  | 11%  |
| NGDP Per Capita rel. to US                                | 3%   | 13%  | 11%  | 29%  | 21%  | 49%  | 22%  | 26%  | 23%  | 108% | 43%  | 100% | 90% | 79% | 106% | 58% | 86% | 135% | 66% | 84%  |

##### Cohort Level Costs

| Country  | IN   | CN   | TH   | RU   | MX   | KR   | BR   | HU   | AR   | SG   | GR   | US | JP   | GB   | CA   | ES   | DE   | AU   | IT   | FR   |
|--|------|------|------|------|------|------|------|------|------|------|------|----|------|------|------|------|------|------|------|------|
| Cost of Tertiary Educated Worker rel. to the US, Adj. for Ed. Quality  | -96% | -89% | -90% | -72% | -70% | -71% | -50% | -71% | -62% | -43% | -56% | 0% | -43% | -10% | -13% | -28% | -5%  | 17%  | -8%  | 20%  |
| Cost of Secondary Educated Worker rel. to the US, Adj. for Ed. Quality | -94% | -87% | -84% | -72% | -66% | -59% | -49% | -59% | -44% | -37% | -31% | 0% | -9%  | 7%   | 18%  | 17%  | 52%  | 67%  | 50%  | 87%  |
| Cost of Primary Educated Worker rel. to the US, Adj. for Ed. Quality   | -88% | -82% | -75% | -60% | -53% | -33% | -40% | -34% | -36% | 10%  | 16%  | 0% | 77%  | 44%  | 75%  | 105% | 134% | 115% | 131% | 176% |
| Cost of Literate, Uneducated Worker rel. to the US                     | -93% | -88% | -86% | -61% | -76% | -35% | -78% | -45% | -80% | 10%  | -31% | 0% | 109% | 8%   | 60%  | 29%  | 122% | 36%  | 27%  | 84%  |
| Cost of Illiterate, Uneducated Worker rel. to the US                   | -94% | -91% | -89% | -59% | -83% | -36% | -89% | -40% | -84% | -23% | -35% | 0% | 123% | 3%   | 56%  | 11%  | 131% | 24%  | 8%   | 88%  |

#### ii. Labor Productivity

##### Cost of a Productivity Adjusted Educated Worker

| Country  | IN   | CN   | TH   | RU   | MX   | HU   | KR   | BR   | AR   | GR   | US | SG   | GB   | ES   | CA   | JP   | DE   | IT   | FR   | AU   |
|--|------|------|------|------|------|------|------|------|------|------|----|------|------|------|------|------|------|------|------|------|
| Cost of a Productivity Adjusted Educated Worker rel. to the US | -96% | -83% | -83% | -72% | -68% | -67% | -50% | -46% | -44% | -14% | 0% | 3%   | 45%  | 56%  | 75%  | 77%  | 77%  | 98%  | 126% | 156% |
| Observed Productivity rel. to the US                           | 43%  | -22% | 22%  | 16%  | -5%  | 38%  | -15% | -20% | 3%   | -1%  | 0% | 14%  | -23% | 7%   | -24% | -23% | 4%   | -1%  | 2%   | -43% |
| Cost of Tertiary Educated Worker rel. to the US                | -98% | -89% | -92% | -73% | -77% | -71% | -67% | -63% | -72% | -59% | 0% | -33% | -8%  | -28% | -4%  | -34% | 2%   | -8%  | 24%  | 20%  |
| Cost of Secondary Educated Worker rel. to the US               | -97% | -86% | -88% | -72% | -73% | -60% | -54% | -63% | -59% | -36% | 0% | -25% | 10%  | 17%  | 30%  | 5%   | 63%  | 50%  | 92%  | 72%  |
| Cost of Primary Educated Worker rel. to the US                 | -93% | -82% | -80% | -61% | -63% | -36% | -25% | -56% | -53% | 8%   | 0% | 31%  | 47%  | 105% | 93%  | 104% | 151% | 129% | 184% | 122% |
| Cost of Literate, Uneducated Worker rel. to the US             | -93% | -88% | -86% | -61% | -76% | -45% | -35% | -78% | -80% | -31% | 0% | 10%  | 8%   | 29%  | 60%  | 109% | 122% | 27%  | 84%  | 36%  |
| Cost of Illiterate, Uneducated Worker rel. to the US           | -94% | -91% | -89% | -59% | -83% | -40% | -36% | -89% | -84% | -35% | 0% | -23% | 3%   | 11%  | 56%  | 123% | 131% | 8%   | 88%  | 24%  |

#### iii. Working Hard

##### Avg. Hours Worked

| Country  | TH  | IN  | CN  | MX  | SG  | JP  | AR  | KR  | BR  | AU  | RU  | GR  | CA  | US  | GB  | HU  | IT  | ES  | DE  | FR  |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Avg. Actual Hours Worked per Working Aged Male | 40  | 37  | 35  | 35  | 35  | 31  | 29  | 29  | 28  | 27  | 25  | 25  | 24  | 24  | 23  | 21  | 20  | 20  | 18  | 17  |
| Male Reported Avg. Hours Worked (ex Vacation)  | 51  | 47  | 47  | 46  | 46  | 45  | 44  | 41  | 38  | 39  | 38  | 43  | 36  | 37  | 37  | 36  | 34  | 30  | 31  |     |
| Male Labor Force Participation                 | 81% | 81% | 78% | 80% | 78% | 70% | 75% | 72% | 81% | 72% | 71% | 63% | 71% | 70% | 69% | 60% | 59% | 67% | 66% | 62% |
| Unemployment Rate (10yr Avg.)                  | 1%  | 4%  | 4%  | 4%  | 2%  | 4%  | 9%  | 3%  | 8%  | 5%  | 7%  | 10% | 7%  | 7%  | 7%  | 9%  | 8%  | 16% | 9%  | 9%  |

##### Demographics

| Country                                     | MX    | IN    | BR    | AR   | TH   | ES   | GB   | IT   | GR   | CN   | FR   | AU   | HU   | DE   | US   | JP   | SG   | RU   | KR   | CA |
|---|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----|
| Projected Annual Change in Dependency Ratio | -0.4% | -0.4% | -0.1% | 0.0% | 0.4% | 0.5% | 0.5% | 0.5% | 0.6% | 0.7% | 0.7% | 0.7% | 0.7% | 0.8% | 0.8% | 0.9% | 0.9% | 1.0% | 1.1% |    |

#### iv. Investing

Best ← → Worst

| Investing                  |  | CN  | SG  | IN  | AU  | KR  | FR  | ES  | TH  | IT  | CA  | DE  | US  | JP  | MX  | AR  | HU  | BR  | RU  | GB   | GR |
|----------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|----|
| Country                    |  | 30% | 25% | 14% | 26% | 27% | 17% | 16% | 19% | 15% | 18% | 13% | 14% | 19% | 14% | 17% | 15% | 15% | 13% | 9%   |    |
| Investment ex Housing %GDP |  | 33% | --- | 24% | 9%  | 5%  | 12% | 3%  | 5%  | 5%  | 5%  | 9%  | 5%  | -1% | 9%  | --- | 5%  | --- | 13% | -15% |    |
| Household Savings Rate     |  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |    |

#### Productivity - Culture

##### i. Self-Sufficiency

| Work Ethic Measures                                  |  | TH  | IN  | MX  | SG  | CN  | JP  | KR  | AR  | BR  | AU  | RU  | US  | CA  | GB  | GR  | HU  | ES  | IT  | DE  | FR  |
|--|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Country  |  | 40  | 37  | 35  | 35  | 35  | 31  | 29  | 29  | 28  | 27  | 25  | 24  | 24  | 23  | 25  | 21  | 20  | 20  | 18  | 17  |
| Avg. Actual Hours Worked (Hrs/wk)                    |  | 51  | 47  | 46  | 46  | 47  | 45  | 41  | 44  | 38  | 39  | 38  | 37  | 36  | 37  | 43  | 37  | 34  | 36  | 30  | 31  |
| Male Reported Avg. Hours Worked (ex Vacation)        |  | 81% | 81% | 80% | 78% | 78% | 70% | 72% | 75% | 81% | 72% | 71% | 70% | 71% | 69% | 63% | 60% | 67% | 59% | 66% | 62% |
| Labor Force Participation (% Working Age Population) |  | --- | 92% | 98% | --- | 72% | 88% | 94% | 91% | 78% | 82% | 93% | 87% | 81% | 82% | 80% | 87% | 79% | 79% | 81% | 77% |
| Effective Retirement Age (% of Life Expectancy)      |  | --- | 2.3 | 1.9 | 2.0 | 2.6 | 1.0 | 1.6 | --- | 4.3 | 2.3 | 3.8 | 3.3 | 3.6 | 6.5 | 5.9 | 5.5 | 6.8 | 5.9 | 7.0 | 7.0 |
| Actual Vacation+Holidays Per Year (Weeks)            |  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

| Government Support Measures     |  | SG  | CN  | IN  | KR  | MX  | TH  | RU  | BR  | AU  | CA  | AR  | US  | JP  | GB  | ES  | HU  | GR  | DE  | IT  | FR  |
|---------------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Country                         |  | --- | 6%  | 5%  | 9%  | 7%  | --- | 12% | 16% | 20% | 18% | --- | 20% | 22% | 24% | 27% | 22% | 22% | 26% | 28% | 33% |
| Transfer Payments to HH, % PGDP |  | 15% | 24% | 27% | 22% | 27% | 24% | 38% | 40% | 37% | 46% | 41% | 40% | 40% | 45% | 46% | 50% | 51% | 46% | 51% | 57% |

| Rigidity of Labor Market Measures   |  | SG  | CN  | IN  | US   | MX  | CA  | HU   | DE  | GB   | BR   | GR   | KR   | ES  | RU  | CN   | JP   | FR   | AU  | TH   | IT   | AR |
|-------------------------------------|--|-----|-----|-----|------|-----|-----|------|-----|------|------|------|------|-----|-----|------|------|------|-----|------|------|----|
| Country                             |  | 17% | 2%  | 11% | 14%  | 27% | 17% | 18%  | 26% | 19%  | 25%  | 10%  | 16%  | 41% | 30% | 18%  | 8%   | 18%  | --- | 36%  | 40%  |    |
| Unionization as % of Workforce      |  | 3.3 | 0.9 | 2.2 | -0.4 | 1.8 | 0.9 | -0.5 | 1.5 | -0.6 | -0.1 | -0.2 | -0.6 | 0.5 | 1.3 | -1.1 | -1.7 | -1.1 | 1.2 | -1.6 | -1.4 |    |
| Ease of Hiring/Firing (Z)           |  | --- | 15% | 19% | 8%   | 27% | 27% | 20%  | 32% | 23%  | 23%  | 33%  | 28%  | 24% | 37% | 29%  | 33%  | 31%  | 41% | 41%  | 51%  |    |
| Minimum Wage as % of Average Income |  |     |     |     |      |     |     |      |     |      |      |      |      |     |     |      |      |      |     |      |      |    |

Best ← → Worst

## ii. Savoring Life vs. Achieving

### Work Ethic Measures

| Country  | TH  | IN  | MX  | SG  | CN  | JP  | KR  | AR  | BR  | AU  | RU  | US  | CA  | GB  | GR  | HU  | ES  | IT  | DE  | FR  |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Avg. Actual Hours Worked (Hrs/wk)                    | 40  | 37  | 35  | 35  | 35  | 31  | 29  | 29  | 28  | 27  | 25  | 24  | 24  | 23  | 25  | 21  | 20  | 20  | 18  | 17  |
| Male Reported Avg. Hours Worked (ex Vacation)        | 51  | 47  | 46  | 46  | 47  | 45  | 41  | 44  | 38  | 39  | 38  | 37  | 36  | 37  | 43  | 37  | 34  | 36  | 30  | 31  |
| Labor Force Participation (% Working Age Population) | 81% | 81% | 80% | 78% | 78% | 70% | 72% | 75% | 81% | 72% | 71% | 70% | 71% | 69% | 63% | 60% | 67% | 59% | 66% | 62% |
| Effective Retirement Age (% of Life Expectancy)      | --- | 92% | 98% | --- | 72% | 88% | 94% | 91% | 78% | 82% | 93% | 87% | 81% | 82% | 80% | 87% | 79% | 79% | 81% | 77% |
| Actual Vacation+Holidays Per Year (Weeks)            | --- | 2.3 | 1.9 | 2.0 | 2.6 | 1.0 | 1.6 | --- | 4.3 | 2.3 | 3.8 | 3.3 | 3.6 | 6.5 | 5.9 | 5.5 | 6.8 | 5.9 | 7.0 | 7.0 |

### Savoring Life vs. Achieving -- Expressed Values

| Country   | IN   | CN   | US   | SG   | TH   | MX   | AU   | ES   | KR   | RU   | HU   | DE   | CA   | JP   | GB   | AR   | BR   | FR   | IT   |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| For future of country, value of having more say v. economic growth, defense, and making cities and countryside more beautiful | 0.7  | 1.0  | 0.3  | 0.2  | 0.9  | -0.7 | -1.0 | -0.7 | -0.5 | 0.5  | 0.2  | -1.2 | -1.5 | -0.3 | -1.7 | -0.4 | -0.4 | -1.6 | -1.0 |
| Hard work leads to success  | 1.0  | 0.7  | 0.5  | -0.2 | -1.0 | 1.1  | 0.2  | 0.0  | 0.1  | -1.3 | -0.9 | -0.5 | 0.3  | -0.7 | -0.3 | -0.7 | -0.5 | -1.3 | -1.2 |
| Competition is harmful  | 1.7  | 0.4  | 0.5  | -1.0 | -1.5 | 0.6  | 0.4  | -0.4 | -0.2 | -0.7 | -0.8 | -0.3 | 0.0  | -0.7 | -0.6 | -1.4 | -0.6 | -2.0 | -1.0 |
| It is important to this person to have a good time  | 0.4  | 1.0  | 1.0  | 0.0  | 0.2  | -1.0 | 1.0  | -0.4 | -0.1 | -0.3 | -0.8 | -0.5 | 0.3  | 1.3  | 0.4  | 1.0  | -0.9 | -1.0 | ---  |
| It is important to this person to be very successful  | 1.6  | 0.0  | -1.0 | -0.1 | -0.2 | 0.2  | -1.3 | -0.5 | -0.2 | 0.1  | -0.3 | -0.1 | -0.6 | -1.5 | -1.2 | -0.9 | -0.7 | ---  | ---  |
| Economic growth is more important than the environment  | -0.4 | -1.0 | 0.2  | 1.0  | 0.6  | -0.7 | -0.6 | 0.1  | 0.2  | -0.2 | 0.2  | 0.5  | -1.5 | 0.0  | -0.7 | -1.2 | -1.0 | -0.2 | -0.9 |

## iii. Innovation and Commercialism

### Innovation & Commercialism Outputs

| Country   | US  | JP    | KR    | AU  | GB  | CA  | SG  | DE  | FR  | HU   | MX   | IT  | ES   | AR   | TH  | CN   | RU   | BR   | GR   | IN   |
|---|-----|-------|-------|-----|-----|-----|-----|-----|-----|------|------|-----|------|------|-----|------|------|------|------|------|
| # New Patents (per mln persons)                     | 844 | 2,246 | 3,022 | 113 | 243 | 135 | 205 | 562 | 228 | 70   | 10   | 140 | 71   | 18   | 15  | 389  | 200  | 25   | 56   | 8    |
| # New Businesses (per thous. Person)                | --- | 1     | 2     | 12  | 11  | 1   | 8   | 1   | 3   | 5    | 1    | 2   | 3    | 1    | 1   | ---  | 4    | 2    | 1    | 0    |
| # New Major Websites (per thous. Persons), Index    | 100 | 20    | 10    | 84  | 76  | 93  | 33  | 66  | 49  | 13   | 3    | 25  | 31   | 4    | 7   | 2    | 4    | 2    | 14   | 1    |
| % of People Creating New Businesses                 | 9   | 2     | 3     | 6   | 4   | 8   | 6   | 3   | 3   | 6    | 12   | 2   | 3    | 11   | 8   | 5    | 3    | 5    | 3    | 5    |
| New Trademark Creation (Z - Score)                  | 1.8 | 0.0   | 0.1   | 1.3 | 1.1 | 1.8 | --- | 1.2 | 0.9 | -0.9 | -0.8 | 0.4 | -0.3 | -0.8 | --- | -1.0 | -1.1 | -1.0 | -0.9 | -1.0 |
| Royalty and license fees, payments Ann. (\$)/Person | 102 | 35    | 10    | 7   | 69  | 15  | 69  | 24  | 56  | 21   | 0    | 10  | 9    | 1    | 1   | 0    | 0    | 0    | 3    | 0    |

### Innovation & Commercialism Inputs

| Country                                    | KR    | US    | DE    | JP    | GB    | SG    | AU    | CA    | CN    | ES    | FR    | BR    | AR    | TH   | GR    | RU    | HU    | IN   | MX  | IT    |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|------|-----|-------|
| Gross expenditure on R&D (%GDP)            | 4.4   | 2.8   | 2.9   | 3.3   | 1.7   | 2.2   | 2.4   | 1.7   | 2.0   | 1.3   | 2.3   | 1.2   | 0.6   | 0.3  | 0.7   | 1.1   | 1.3   | 0.8  | 0.4 | 1.3   |
| Researchers (per mln persons)              | 7,699 | 4,663 | 6,280 | 7,011 | 6,872 | 7,321 | 4,224 | 4,260 | 1,393 | 4,735 | 5,328 | 1,203 | 1,942 | 581  | 4,069 | 2,603 | 3,696 | 137  | 386 | 2,496 |
| Fear of Business Failure (Z - Score)       | -1.1  | 0.6   | -0.6  | -2.2  | -0.2  | -0.8  | -1.3  | 0.0   | 0.2   | -0.2  | -1.0  | -0.6  | 1.6   | -2.2 | -2.2  | 1.0   | -1.6  | -0.6 | 0.5 | -2.2  |
| Entrepreneurship Prevalance (% population) | 9%    | 8%    | 5%    | 6%    | 7%    | 4%    | 9%    | 8%    | 11%   | 8%    | 4%    | 15%   | 10%   | 28%  | 13%   | 3%    | 7%    | 11%  | 4%  | 4%    |

#### iv. Bureaucracy

Best ← → Worst

##### Bureaucracy

| Country                           | SG  | GB  | US  | AU   | KR  | CA   | TH   | DE   | MX   | FR   | HU   | GR   | JP   | CN   | ES   | IT   | RU   | BR   | IN   | AR   |
|-----------------------------------|-----|-----|-----|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Starting a Business               | 2.4 | 1.7 | 1.9 | 2.4  | 1.5 | 2.5  | -0.4 | -1.1 | 1.0  | 1.3  | 0.6  | 0.7  | -1.4 | -2.7 | -2.1 | -0.4 | -0.4 | -1.5 | -3.4 | -2.8 |
| Dealing with Construction Permits | 2.0 | 1.3 | 1.1 | 1.8  | 1.6 | -1.3 | 1.7  | 1.8  | 0.9  | -0.5 | 0.7  | 0.2  | -0.5 | -3.4 | -0.8 | -1.2 | -3.2 | -1.8 | -3.3 | -3.3 |
| Burden of government regulation   | 4.0 | 1.5 | 0.8 | -0.5 | 0.3 | 1.3  | 0.7  | 1.3  | -0.1 | -0.8 | -1.5 | -1.9 | 0.7  | 2.8  | -0.6 | -2.1 | -0.6 | -2.5 | 0.0  | -1.7 |

#### v. Corruption

##### Corruption

| Country   | SG  | CA  | JP  | DE  | GB  | AU  | FR  | US   | ES   | KR   | CN   | HU   | BR   | IT   | TH   | GR   | MX   | IN   | RU   | AR   |
|---|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Transparency Int'l Corruption Index             | 1.9 | 1.6 | 1.1 | 1.4 | 1.2 | 1.6 | 0.9 | 1.1  | 0.2  | -0.1 | -1.0 | -0.1 | -0.9 | -0.8 | -1.3 | -1.1 | -1.4 | -1.3 | -1.8 | -1.4 |
| Diversion of Public Funds                       | 2.1 | 1.3 | 1.3 | 1.4 | 1.7 | 1.2 | 0.7 | 0.5  | -0.9 | -0.8 | -0.2 | -1.6 | -2.0 | -1.4 | -1.4 | -1.5 | -1.5 | -1.4 | -1.7 | -2.5 |
| Irregular payments and bribes                   | 2.2 | 1.3 | 1.7 | 1.2 | 1.5 | 1.2 | 0.8 | 0.1  | -0.1 | -0.6 | -1.1 | -0.6 | -1.2 | -1.2 | -1.4 | -1.6 | -1.5 | -2.0 | -2.1 | -2.5 |
| Favoritism in decisions of government officials | 2.9 | 1.1 | 1.9 | 1.6 | 1.2 | 0.8 | 0.5 | -0.3 | -0.5 | -0.9 | 0.7  | -1.5 | -0.9 | -1.7 | -1.0 | -1.5 | -0.9 | -1.1 | -1.5 | -2.7 |

#### vi. Rule of Law

##### Rule of Law

| Country  | SG  | GB   | CA   | US  | JP  | DE   | AU   | FR   | TH   | KR   | CN   | ES   | MX   | IN   | BR   | HU   | IT   | RU   | GR   | AR   |
|--|-----|------|------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Efficiency of legal framework in settling disputes | 3.4 | 2.3  | 2.1  | 0.9 | 0.9 | 1.8  | 0.9  | 0.0  | -0.5 | -1.0 | 0.1  | -0.7 | -1.4 | -0.5 | -1.4 | -1.8 | -3.0 | -2.0 | -2.7 | -2.6 |
| Property rights                                    | 2.7 | 2.3  | 2.1  | 0.5 | 1.7 | 1.8  | 0.8  | 1.5  | -1.5 | -0.5 | -0.3 | -0.2 | -1.2 | -0.8 | -0.4 | -2.0 | -1.0 | -3.3 | -1.6 | -4.2 |
| Protecting Investors                               | 2.5 | 2.2  | 2.4  | 2.3 | 1.9 | -1.4 | -0.2 | -0.7 | 2.1  | 0.5  | -1.4 | -1.4 | -0.2 | 1.2  | -0.7 | -2.7 | 0.5  | -2.1 | -0.9 | -1.4 |
| Enforcing Contracts                                | 1.3 | -0.3 | -0.3 | 1.4 | 0.5 | 1.6  | 1.2  | 1.5  | 1.0  | 1.7  | 1.1  | -0.4 | -0.8 | -5.0 | -2.6 | 1.2  | -2.2 | 1.4  | -1.7 | -0.3 |

## Part 3: The Rises and Declines of Economies Over the Last 500 Years

As mentioned above, productivity, indebtedness and luck (e.g., whether one has wars or natural resources) explain differences in countries' relative performance. This part looks at how different countries' shares of the world economy have changed and why the drivers discussed above caused these changes to occur, with a particular emphasis on the period since 1820. As I explain below, the rises and declines in countries' shares of the world economy occur as a result of very long-term cycles that are not apparent to observers who look at economic conditions from a close-up perspective.

### The Past 500 Years

To begin, let's look at how the world economic pie has been divided up over time and why it has changed. The table below shows the shares of world GDP by major countries and/or regions at various points in time going back to 1500. Scan that table to see how these shares have evolved over time. Note how China and India were the largest economies from 1500 through 1820, how the United States was nothing and how what people now call the emerging world was much bigger than what they now call the developed world.

| Year                           | Share of World GDP. Real, PPP Adjusted. |           |           |           |           |           |           |           |           |           |           |           |
|--------------------------------|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                                | 1500                                    | 1600      | 1700      | 1820      | 1870      | 1913      | 1950      | 1973      | 1998      | 2006      | 2010      | Today     |
| <b>Current Developed World</b> | <b>21</b>                               | <b>23</b> | <b>27</b> | <b>29</b> | <b>46</b> | <b>58</b> | <b>72</b> | <b>70</b> | <b>65</b> | <b>60</b> | <b>54</b> | <b>51</b> |
| US                             | 0                                       | 0         | 0         | 2         | 9         | 19        | 30        | 26        | 26        | 26        | 23        | 22        |
| United Kingdom                 | 1                                       | 2         | 3         | 5         | 9         | 8         | 8         | 5         | 4         | 4         | 3         | 3         |
| Other Western Europe           | 17                                      | 18        | 20        | 18        | 25        | 25        | 26        | 26        | 22        | 20        | 18        | 16        |
| Japan                          | 3                                       | 3         | 4         | 3         | 2         | 3         | 3         | 9         | 9         | 7         | 7         | 6         |
| Canada/Australia               | 0                                       | 0         | 0         | 0         | 1         | 3         | 5         | 4         | 4         | 4         | 3         | 3         |
| <b>Current Emerging World</b>  | <b>78</b>                               | <b>77</b> | <b>73</b> | <b>71</b> | <b>54</b> | <b>42</b> | <b>28</b> | <b>30</b> | <b>35</b> | <b>40</b> | <b>46</b> | <b>49</b> |
| China                          | 25                                      | 29        | 22        | 33        | 17        | 9         | 2         | 2         | 7         | 11        | 15        | 18        |
| India                          | 25                                      | 23        | 24        | 16        | 12        | 8         | 4         | 3         | 4         | 5         | 6         | 7         |
| Other Asia                     | 13                                      | 11        | 11        | 7         | 7         | 5         | 3         | 4         | 7         | 7         | 8         | 8         |
| Latin America                  | 3                                       | 1         | 2         | 2         | 3         | 5         | 7         | 9         | 10        | 9         | 9         | 9         |
| Former USSR                    | 3                                       | 4         | 4         | 5         | 8         | 9         | 7         | 7         | 3         | 3         | 3         | 3         |
| Africa                         | 7                                       | 7         | 7         | 5         | 4         | 3         | 1         | 1         | 1         | 1         | 1         | 1         |
| Eastern Europe                 | 3                                       | 3         | 3         | 3         | 4         | 5         | 4         | 4         | 3         | 3         | 3         | 3         |

Though the table goes back to 1500—i.e., to eight years after Columbus "discovered America"—we won't track the changes since then, but we will track them back to 1820. As shown:

- **In 1820 China and India were the biggest economic powers.** Their shares declined as they became decadent<sup>387</sup> and overly indebted. As a result they were overtaken, both economically and militarily, by the emerging British Empire in the late 19<sup>th</sup> and early 20<sup>th</sup> century.
- **From the second half of the 19<sup>th</sup> century until the early 20<sup>th</sup> century, England and other Western European countries emerged to become the world's dominant powers and the United States moved from being an undeveloped country to an emerging country.** The emergence of the British

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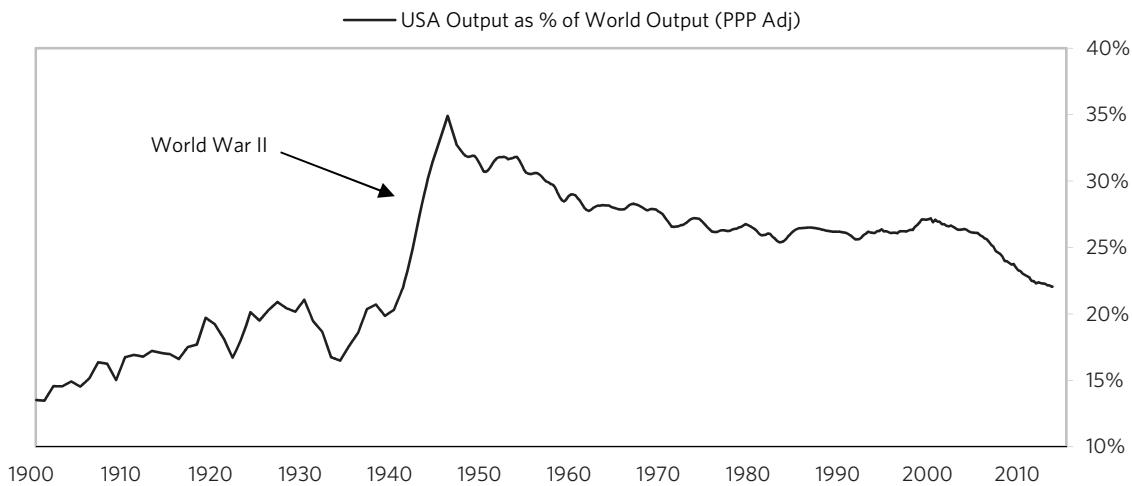
<sup>387</sup> By "decadent" I mean a less strong state arising from a shifting of priorities from working, fighting and competing to avoiding these and to savoring the fruits of life.

*Empire and other European powers to dominance was fueled by two big waves of productivity growth called the Industrial Revolution.*

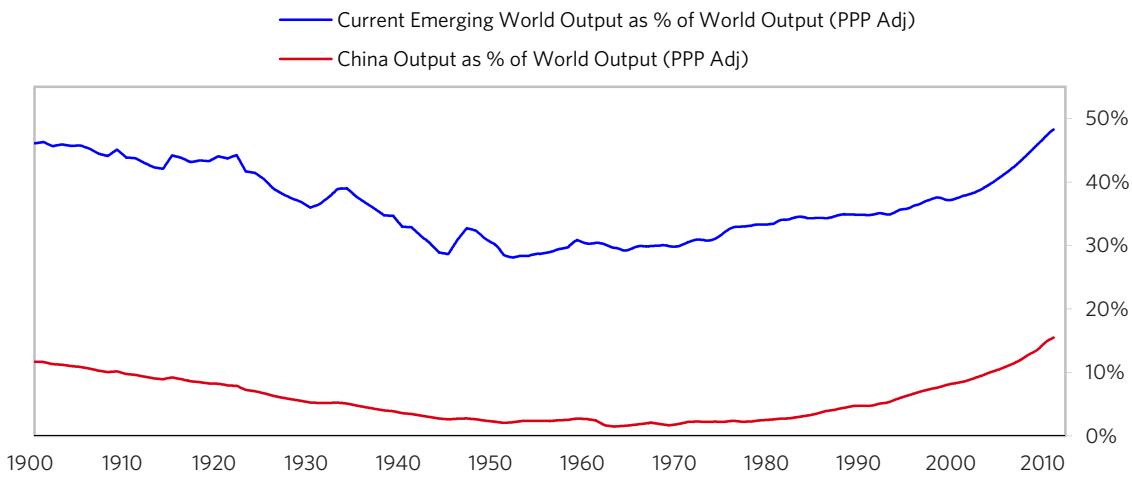
- **During the years from 1914-45 the British Empire gained relative to other Western European countries and lost relative to the emerging American Empire.** This was largely the result of 1) European countries' rivalries leading them to two costly wars that left them indebted and crippled, and 2) the increasing "decadence" of the wealthy European powers. Because the British won these wars they benefited in relation to their European rivals (especially Germany); however, they became overly indebted and suffered economically relative to the United States because of them. At the same time the United States was an emerging power largely as the result of its great productivity gains.
- **In the mid-20<sup>th</sup> century the United States emerged to become the world's dominant economic power and the British Empire crumbled.** That was primarily the result of World War II because the economic and other setbacks of the war were greatest in England, Western Europe, Japan, China, India, and other emerging countries.
- **From the mid-20<sup>th</sup> century (i.e., the immediate post-World War II period of 1945-55) until the beginning of the new millennium (2000-2010) the United States remained the dominant power, though its share declined steadily as other countries reemerged.** From 1950 to 1970 the reemergence of Japan and Germany occurred as they recovered from the war setbacks. In the 1970-80 period, relative growth became strongest in what then became known as "emerging countries"— Latin America (due to the 1970s commodity boom) and the "Asian 4 Tigers" (as they entered the world markets as competitive producers and exporters). Then in the 1980-present period, great productivity gains in China (as a result of its "open-door" and "market-oriented" policies) and India (as a result of reductions in its bureaucracy and its opening up) allowed them to reemerge. At the same time the United States became overly indebted as a result of its "decadence" and its declining competitiveness.
- **Now about half of world GDP is produced in what people now call the "developed world" (US, Europe, Japan, UK, Canada and Australia) with about equal amounts being produced in the US and Europe, and about half of world GDP is produced in what people now call "emerging countries" with about half of that being produced in China and India.**
- **For reasons explained previously, I believe that in another 15-20 years emerging countries will produce about 70% of global GDP, China will produce about 25%, and India will produce about 12%, as they did in the mid-19<sup>th</sup> century.**

## Since 1900

While in the past civilizations rose and declined over several hundred years, more recently (over the last couple of hundred years), these cycles have taken 100-150 years. That means to observe a few cycles you'd have to go back a few hundred years. However, that's beyond the scope of this exercise, so I will start in 1900. The chart below shows the US share of world GDP going back to 1900. It shows how World War II catapulted the US relative share to an abnormally high level as the result of a number of the other major countries (e.g., Europe, Japan, China and Russia) being set back by the war and the gradual adjustment back to more normal levels. In addition to the war effects benefiting the relative position of the US, inefficient economic systems and/or political bureaucracies in some countries (China, Russia and India) caused these countries' recoveries to be slower than normal until recent years.



The next chart shows the “emerging countries” share of world GDP going back to 1900 along with China’s piece of it. As shown below, while emerging countries as a whole increased their share of the world economy starting in 1950, it was not until 1980 that China’s share started to increase.



Sources: Global Financial Data & BW Estimates for charts above

### What Caused These Changes?

As mentioned, over the last couple of hundred years these changes have been due to a) productivity growth, b) debt cycles, and c) other shocks and distortions (e.g., wars, the good or bad luck of having natural resources, political shifts, etc.)

Over the very long run one gets to spend what one earns, which is a function of one’s productivity. For a country as a whole, the earnings will equal a) the number of workers, times b) the number of hours worked, times c) the output per hour worked. In order to be more productive, you have to work either harder or smarter. Over the shorter run, one can spend an amount that is different than the amount one earns because of borrowing and lending. Human nature (i.e., culture) plays a big role determining people’s productivity and indebtedness. Over long time frames the drive for higher living standards motivates people to implement changes to get around their impediments, which goes on until people’s earnings gravitate toward their potential/equilibrium levels and levels of productivity and indebtedness change in ways that shift income growth. I examined the cause-effect linkages

of productivity and indebtedness previously, but here I will lay out the concepts and walk you through the logic of how shifts in productivity and indebtedness lead to big cycles in which countries prosper and which ones don't.

All else being equal, per capita incomes of countries will tend to converge because, in a competitive world, buyers of goods, services and labor shift their demands away from those who are expensive to those who offer better value, which creates a *labor rate arbitrage*. But all things are not equal. Differences and barriers often exist that justify income differences. Based on our research, the most important of these differences that account for most income gaps are in culture, education, economic and political systems, savings and investment rates, indebtedness, and remoteness of location.<sup>388</sup> Also, trade and capital control barriers can stand in the way of economic competition that brings about income conversion. If these economic barriers are temporary in nature (e.g., war damage) the forces behind this labor rate arbitrage will get rid of them (e.g., there will be rebuilding). If the impediments are more permanent in nature (e.g., culture, remoteness of location, etc.), the forces behind the arbitrage won't be able to overcome them, even over very long periods. Additionally, long-term debt cycles play a big role in driving these cycles. When debt levels are low relative to income levels and are rising, the upward cycle is self-reinforcing until debt levels become too high for this to continue, when the reverse occurs.

For these reasons, when I see big differences in income and indebtedness, I ask myself whether the impediments are temporary or more permanent in nature—e.g., are there good reasons that an average Chinese earns 1/10<sup>th</sup> as much as an average American?—and I imagine the changes that will have to occur to bring this labor rate convergence about (e.g., building infrastructure, changing laws, bringing in capital, etc.), and I try to visualize the ripple effects of these changes (e.g., buying more commodities, creating more pollution) and the likelihood of these things happening. I believe that's where the big investment opportunities of the century lie.

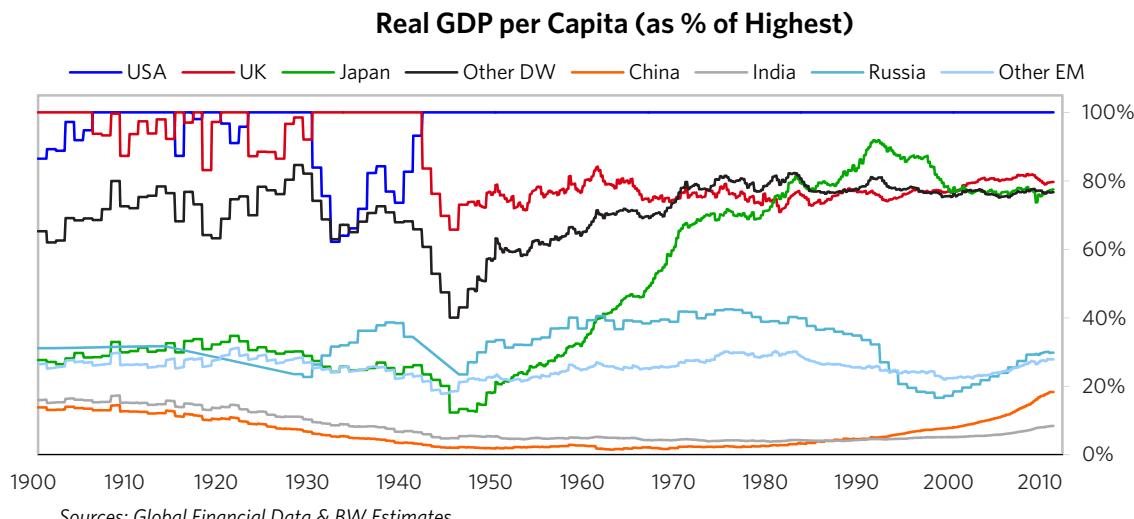
Not all important changes are due to economic influences because not all competition is economic. For example, throughout history war has frequently been an important means of competing and, when wars happen, they typically impede the labor rate arbitrage.

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<sup>388</sup> By remoteness of location, I am referring to when some people are in locations that are too removed from their competitors, either geographically or technologically, to allow them to compete. For example, populations that are located down a river, up a mountain or beyond distances that can be cost-effectively bridged to allow these people to compete are too remote. Similarly, people who do not have access to proper resources to compete (e.g., education) are too remote to allow the force of the labor arbitrage to work. In places like China, India, and Africa, large percentages of the population are too remote to compete, while other portions of their populations are well positioned to compete, so that the average incomes will be affected by both..

Since the previously shown table and charts are based on both the number of people in the country and their average incomes, and average incomes are more relevant in seeing how countries compete, let's look at their relative incomes. The chart below shows per capita GDPs as a percent of the highest per capita GDP since 1900. As shown:

- **Until the end of World War II, the UK** had the highest per capita income. It was then replaced by the US. This shift represented the end of the British Empire and the emergence of the American Empire. I will examine this later.
- **Prior to World War II, developed countries other than Japan** typically had incomes that were about 70% of the top income country. For reasons explained later, the country with the greatest total income has also typically been the reserve currency country and has derived income benefit from being in this position; this accounts for a significant part of the gap between the top income earning country (the UK prior to the mid-20<sup>th</sup> century and the US after then) and the other developed countries. Note how the shock of World War II sent other developed countries' incomes down to only 40% of the top earner (the US) and how, in the 25 years that followed World War II, average incomes in these countries normalized to 70%-80% of the top earning country.
- **Prior to World War II**, the average income in **Japan** ranged around 25%-35% of the top earner. Then the shock of World War II brought it down to around 15%. After the war it recovered to about 90% of the top (US) in 1990 (at its bubble's peak). Since then, it has slipped back to about 75% of the top, which is also where the UK and other European countries' average incomes are. The long-term shift from an average income of 25%-35% of the top earner to about 75% now has largely been due to Japan opening up to the world economy so that it could compete in it.
- Other **emerging countries** have had their average incomes vary between about 25% and 35% of the top since 1900. I believe that this is because of some fairly long-lasting structural impediments that vary by country and that would require too great of a digression to explain here.
- Per capita incomes in **China** have ranged from 2% to 18% of the top earner over the last 110 years and are now growing at a pace that is comparable with Japan's pace in 1950-70 for essentially the same reasons. Because of the remoteness of a large segment of the population, I don't expect per capita incomes in China to reach developed country levels for the foreseeable future; however, I expect income growth rates to remain strong and reach developed country levels for hundreds of millions of Chinese in another 25 years. Per capita incomes in **Russia** have ranged from 16% to 42% of the top earner over the last 110 years and have increased from 17% to 30% over the last 10 years.



## The Importance of Human Nature in Making Choices

While productivity and indebtedness can be said to be the drivers, it is primarily people's choices that determine their levels of productivity and indebtedness, so psychology is of prominent importance. It is psychology that drives people's desires to work, borrow, consume, and go to war. Since different experiences lead to different psychological biases that lead to different experiences, etc., certain common cause-effect linkages drive the typical cycle. While I will describe what I believe is the typical cycle, of course no cycle is exactly typical.

## The Life Cycle of a Typical Empire

As explained, economic conditions affect human nature and human nature affects economic conditions. This typically happens dynamically in a sequence that leads countries to rise and fall for largely the same reasons that families rise and fall over 3 to 5 generations. I believe that countries typically evolve through five stages of the cycle:

- 1) In the first stage **countries are poor and think that they are poor.**

In this stage they have very low incomes and most people have subsistence lifestyles, they don't waste money because they value it a lot, and they don't have any debt to speak of because savings are short and nobody wants to lend to them. They are undeveloped.

Some emerge from this stage and others don't, with culture and location being the biggest determinants of which emerge and which don't, as these influence people's desires and abilities to compete. For example, in China large percentages of the population are too removed to compete and are likely to remain so for the foreseeable future, so while it is reasonable to expect Chinese incomes in the major cities to approach those in other major cities elsewhere in the world, it is unreasonable to expect the average income of a Chinese person to equal that of an American, or for that matter someone in Beijing, in the foreseeable future.

Those that transition from this stage to the next stage typically gradually accumulate more money than they need to survive, and they save it because they are worried about not having enough in the future. Because they have very low incomes, their labor costs are typically low, so when they begin to emerge, their economic growth is led by them producing low-value-added goods cheaply and selling to rich countries. Because they are low-cost producers, they also typically attract foreign direct investment from companies that want to manufacture in low-cost countries to export to the rich countries (if they are politically stable). These low-cost countries have to provide high returns to attract these investors because of the perceived risks, but they are capable of providing these high returns because they are very cost-effective producers.

At this stage in their development, their currencies and capital markets are undeveloped. As a result, their governments peg their exchange rates to gold or whatever the obvious relevant reserve currency is (typically of the currency bloc that they want to sell their goods to), and their citizens, who gradually accumulate income in excess of spending, typically save/invest in their businesses and by buying hard assets like apartments as savings. Those in these countries who have more money and a more global perspective typically want to invest some money outside the country just to be safe, so they invest in whatever they perceive to be the world's safest investments, most typically government debt in the world's reserve currencies. Because people in this stage value earning money and building savings more than spending money, their governments generally prefer their currencies to be undervalued rather than to be overvalued, and they like to build up their savings/reserves. How fast countries evolve through this stage primarily depends on their cultures and their abilities. I call these countries **early-stage emerging countries.**

2) In the second stage **countries are rich but still think they are poor.**

At this stage they behave pretty much the same as they did when they were in the prior stage but, because they have more money and still want to save, the amount of this saving and investment rises rapidly. Because they are typically the same people who experienced the more deprived conditions in the first stage, and because people who grew up with financial insecurity typically don't lose their financial cautiousness, they still a) work hard, b) have export-led economies, c) have pegged exchange rates, d) save a lot, and e) invest efficiently in their means of production, in real assets like gold and apartments, and in bonds of the reserve countries.

Because their exchange rates remain undervalued, their labor rates and their domestic costs are cheap so they remain competitive. Their competitiveness is reflected in their strong balance of payments, and incomes and net worths rising as fast as or faster than their debts.

Countries in this stage experience rapidly rising income growth and rapidly rising productivity growth at the same time. In the early stages rapid income growth is matched by rapid productivity growth so inflation is not a problem despite the fast increases in incomes and money in the economy. Because of rapidly rising productivity, these countries can also become more competitive in relation to others.

During this stage, these countries' debts typically do not rise significantly relative to their incomes and sometimes they decline. It is a very healthy period.

However, they eventually transition to a stage in which debts rise faster than incomes and incomes rise faster than productivity. Inflation rates rise because rapidly rising income growth leads to rapidly increasing spending on many items that cannot be correspondingly increased in supply via productivity gains. Additionally, by having their currencies linked to reserve currencies, they also link their interest rates to those of the reserve currency countries, who have slower income growth and lower inflation rates. While these interest rates are appropriate for the sluggish growth, low inflation countries, they are too low for the faster growth, higher inflation countries. As a result, these emerging countries have interest rates that are low in relation to their inflation and nominal growth rates. This fuels money and credit growth and inflation. Typically countries in this stage maintain their pegged exchange rates and linked monetary policies via changes in reserves until the upward inflationary/bubble pressures and trade protectionist pressures become too great.

The transition from this stage to the next stage is typically signaled by a) debt growth significantly outpacing income growth, b) accelerating inflation arising from productivity growth not increasing fast enough to offset the increased spending and income growth, c) overinvestment, and d) balance of payments surpluses. This mix of conditions eventually leads to movement to independent currency/monetary policies.<sup>389</sup> This transition to an independent currency policy typically occurs as both a practical necessity and an earned right. As previously mentioned, countries in this second stage run basic balance of payments surpluses that either drive up their exchange rates and/or lead their central banks to lower their real interest rates (which fuels bubbles and inflations) and/or drive up their foreign savings/reserves. So, practical necessity motivates these governments to abandon their pegs and appreciate when they want to curtail inflation and/or bubbles; at the same time, international tensions arising from trade imbalances leading to the loss of jobs in the developed country and capital outflows from that country (e.g., as existed in the US in 1970) also motivate the move. Having an independent currency/monetary policy is an earned right because their performance in the previous stages that led up to this point gave them the credibility to be able to float the currency and have it appreciate. Every country wants to have an independent monetary policy because that is the most powerful tool available for managing the economy; it gives governments the freedom to decide how they

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<sup>389</sup> For example, Japan and Germany in 1971.

will balance inflation and growth in light of their own conditions.<sup>390</sup> For these good reasons no major developed economy has an exchange rate that is pegged to another country's exchange rate. Only relatively small and/or emerging economies forgo their independence because of the practical necessities of being unable to engender enough confidence that their currencies will maintain their value or being unable to manage monetary policy in a viable way.

In the transition to the next stage, their domestic capital markets begin to become more widely accepted, private sector lending begins, and capital formation occurs with both foreign and domestic investors participating in this investment boom.

You can tell countries in this stage from those in the first stage because they are the ones with gleaming new cities and infrastructures next to old ones, they have high savings rates, they enjoy rapidly rising incomes, and they typically have rising foreign exchange reserves. While countries of all sizes can go through this stage, when big countries go through it they are typically emerging into great world powers.

I call these countries late-stage emerging countries.

3) In the third stage **countries are rich and think of themselves as rich.**

At this stage, their per capita incomes approach the highest in the world as their prior investments in infrastructure, capital goods and R&D are paying off by producing productivity gains. At the same time, the prevailing psychology changes from a) putting emphasis on working and saving to protect oneself from the bad times to b) easing up in order to savor the fruits of life. This change in the prevailing psychology occurs primarily because a new generation of people who did not experience the bad times replaces those who lived through them. Signs of this change in mindset are reflected in statistics that show reduced work hours (e.g., typically there is a reduction in the average work week from six days to five) and big increases in expenditures on leisure and luxury goods relative to necessities.

Countries at this stage and in transition to the next typically become the great importers<sup>391</sup> and have symbiotic relationships with the emerging countries that are the great exporters, especially of low-value-added goods. At the same time, the businesses and investors of countries in this stage increasingly look for higher returns by investing in emerging countries where labor costs are cheaper, which further supports the symbiotic relationship, and their capital markets and currencies develop blue-chip status and are actively invested in by both domestic and foreign investors. They also attract the money of investors who seek safety rather than high returns because they are perceived as safe, blue-chip countries. In this stage, capital raising and financial market speculation picks up, largely motivated by both the development of these markets and the good returns that they have provided up to this point. With this development of their capital markets, increasingly spending and investing are financed by borrowing as the prior prosperity and investment gains are extrapolated.

Countries that are large and in this stage almost always become world economic and military powers.<sup>392</sup> They typically develop their militaries in order to project and protect their global interests. Prior to the mid-20<sup>th</sup> century, large countries at this stage literally controlled foreign governments and created empires of them to provide the cheap labor and cheap natural resources to remain competitive. Since the mid-20<sup>th</sup> century, when the American Empire ruled by "speaking softly and carrying a big stick," American "influence" and international agreements provided access for developed countries to the

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<sup>390</sup> As recently reflected in the differences in the conditions of sovereigns that have the right to print their own currencies (e.g., the US, the UK, etc.) and those who don't have that right (Greece, California, etc.), this independence can make a world of difference in being able to maintain control over one's growth/inflation trade-offs.

<sup>391</sup> Japan in 1971-1990 was an exception.

<sup>392</sup> Again, Japan in 1971-1990 was an exception.

emerging countries' cheap labor and investment opportunities without requiring direct control of their governments.

In this stage they are on top of the world and they are enjoying it. I call these countries early stage developed countries.

4) In the fourth stage countries **become poorer and still think of themselves as rich.**

This is the leveraging up phase—i.e., debts rise relative to incomes until they can't any more. The psychological shift behind this leveraging up occurs because the people who lived through the first two stages have died off or become irrelevant and those whose behavior matters most are used to living well and not worrying about the pain of not having enough money. Because the people in these countries earn and spend a lot, they become expensive, and because they are expensive they experience slower real income growth rates. Since they are reluctant to constrain their spending in line with their reduced income growth rates, they lower their savings rates, increase their debts and cut corners. Because their spending continues to be strong, they continue to appear rich, even though their balance sheets deteriorate. The reduced level of efficient investments in infrastructure, capital goods and R&D slow their productivity gains. Their cities and infrastructures become older and less efficient than those in the two earlier stages. Their balance of payments positions deteriorate, reflecting their reduced competitiveness. They increasingly rely on their reputations rather than on their competitiveness to fund their deficits. They typically spend a lot of money on the military at this stage, sometimes very large amounts because of wars, in order to protect their global interests. Often, though not always, at the advanced stages of this phase, countries run "twin deficits"—i.e., both balance of payments and government deficits.

In the last few years of this stage, bubbles frequently occur. By bubbles I mean rapidly increasing debt-financed purchases of goods, services and investment assets. These bubbles emerge because investors, businessmen, financial intermediaries, individuals and policy makers tend to assume that the future will be like the past so they bet heavily on the trends continuing. They mistakenly believe that investments that have gone up a lot are good rather than expensive so they borrow money to buy them, which drives up their prices more and reinforces this bubble process. As their assets go up in value their net worths and spending/income levels rise, which increases their borrowing capacities, which supports the leveraging-up process, and so the spiral goes until the bubbles burst.<sup>393</sup> Bubbles burst when the income growth and investment returns inevitably fall short of the levels required to service these debts. More often than not they are triggered by central bankers who were previously too easy (i.e., that allowed the bubble to develop by allowing debt growth to increase much faster than income growth) tightening monetary policies in an attempt to rein them in. The financial losses that result from the bubble bursting contribute to the country's economic decline.

Whether due to wars<sup>394</sup> or bubbles or both, what typifies this stage is an accumulation of debt that can't be paid back in non-depreciated money, which leads to the next stage.

I call these countries late stage developed countries. While countries of all sizes can go through this stage, when big countries go through it they are typically approaching their decline as great empires.

5) In the last stage of the cycle they typically go through **deleveraging and relative decline, which they are slow to accept.**

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<sup>393</sup> Japan in 1988/90, the US in 1929, the US in 2006/07, Brazil and most other Latin American commodity producers in 1977-79 were classic examples.

<sup>394</sup> Germany in World War I and the UK in World War II were classic examples.

After bubbles burst and when deleveragings occur, private debt growth, private sector spending, asset values and net worths decline in a self-reinforcing negative cycle. To compensate, government debt growth, government deficits and central bank “printing” of money typically increase. In this way, their central banks and central governments cut real interest rates and increase nominal GDP growth so that it is comfortably above nominal interest rates in order to ease debt burdens. As a result of these low real interest rates, weak currencies and poor economic conditions, their debt and equity assets are poor performing and increasingly these countries have to compete with less expensive countries that are in the earlier stages of development. Their currencies depreciate and they like it. As an extension of these economic and financial trends, countries in this stage see their power in the world decline.

These cycles have occurred for as long as history has been written. While no two cycles are identical—they vary according to the countries’ sizes, cultures and a whole host of other influences—the fundamentals of the long-term economic cycle have remained essentially the same over the ages for essentially the same reasons that the fundamentals of life cycles have remained the same over the ages—i.e., because of how man was built. While no two life cycles are the same, and today’s typical life cycle is in some ways different from that of thousands of years ago, the fundamentals remain the same. For example, while families lived in houses that were different ages ago, the cycle of children being raised by parents until they are independent, at which point they work and have their own children which they do until they get old, stop working and die, was essentially the same thousands of years ago. Similarly, while monetary systems were different ages ago (e.g., gold coins were once money), the cycle of building up too much debt until it can’t be serviced with hard money prompting those who manufacture money to make more of it (e.g., reducing the gold content in the coins) is fundamentally the same.

Because these cycles evolve slowly over long time frames—over at least 100+ years—they are imperceptible to most people. They are also essentially irrelevant to rulers who typically have time horizons of a couple of years. As a result, they are not controlled, which is the main reason that they are destined to occur. If human nature were different so that debt growth didn’t outpace income growth and income growth didn’t outpace productivity growth, these cycles would be pretty much eliminated.

### **Example: The Ascent and Decline of the British Empire**

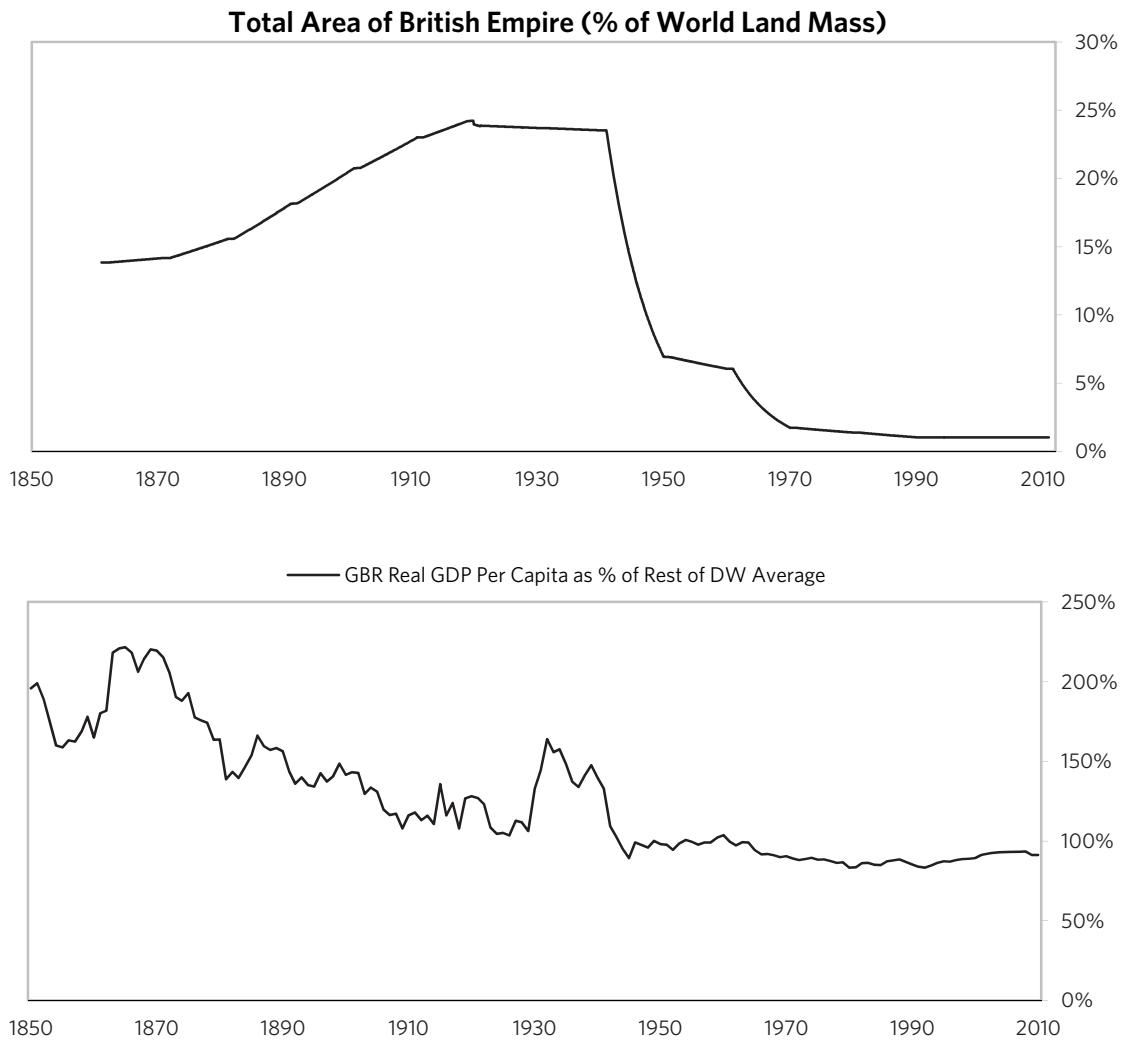
I will explain my view of the ascent and decline of the British Empire both because it is a good example of the previously described process and because it sets the stage for the rise and early decline of the US Empire and what I believe will be the rise and decline of the Chinese Empire.

As with all history, different people will attribute the ascent and decline of the British Empire to different causes, so keep this in mind when reading my theory.

It is pretty well agreed that the ascent of the British Empire began in the late 18<sup>th</sup> century when the Industrial Revolution began and the decline occurred in the middle of the 20<sup>th</sup> century when World War II ended, so its cycle took place over 150 years. It is also agreed that the British Empire’s decline in the mid-20<sup>th</sup> century was accompanied by the emergence of the American Empire which has been dominant for the last 60 years. But there are disagreements about why these things occurred.

While I won’t take you back to when the first wave of the Industrial Revolution began in the late 18<sup>th</sup> century, I will take you back to around 1850. In my opinion, from before then until 1914 Great Britain was in stage 3 of the previously described cycle, from 1914 to 1950 it was in stage 4, and from 1950 until around 1980 it was in stage 5 of the cycle. I will show why I believe this in the charts that follow.

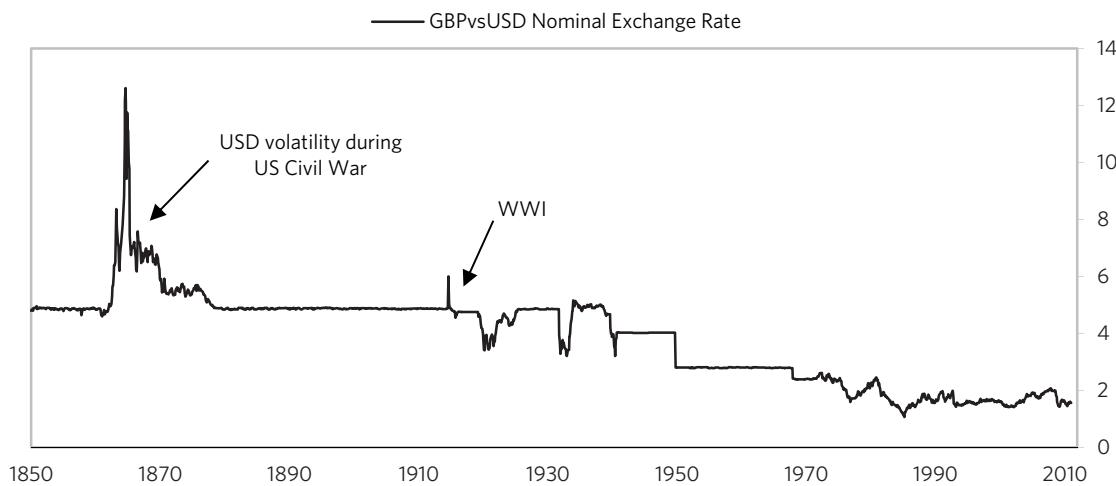
To begin, the chart below shows the geographic size of the British Empire going back to 1860. Note how it rose from 1860 until 1920, flattened out until 1950 and then collapsed. By comparing this chart with the one that follows showing relative incomes, you will note that the size of the British Empire correlated with the level of its relative income. In the charts that follow, you will also see that it correlates with sterling's stature as a reserve currency and that this changed due to the reasons explained in my description of the long-term economic cycle.



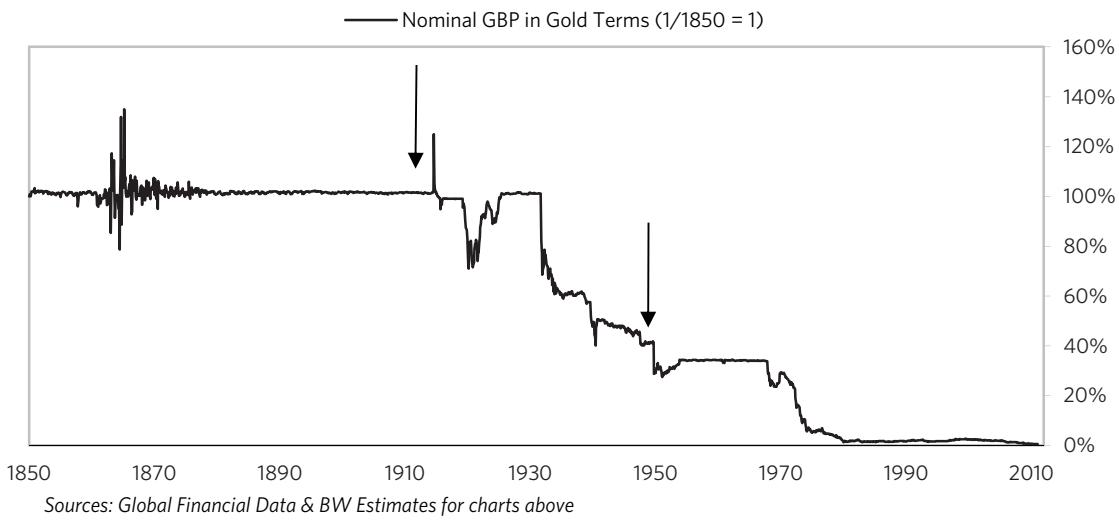
The chart below shows sterling's share of world currency reserves back to 1900 (when its share was over 60%). Note that sterling's share of world reserves accounted for more than 50% until 1950 and declined to about 5% over the next fifty years.<sup>395</sup> As previously mentioned, when empires are at their peaks, their currencies attain reserve currency status which allows them to over-borrow, which leads to their declines.



As previously explained, in the third stage of the cycle, when growth and competitiveness are strong and indebtedness is low, the currency is strong and the country's reserve currency status is enhanced; however, in the fourth stage the reverse is true. In other words, in the fourth stage the currency suffers due to over-indebtedness, increased money creation and uncompetitiveness, and this leads to the reduced desire to hold the currency. The next charts show the value of sterling both against the US dollar and against gold. Note that sterling was rock-solid until World War I and then it was devalued quickly against both the dollar and against gold.



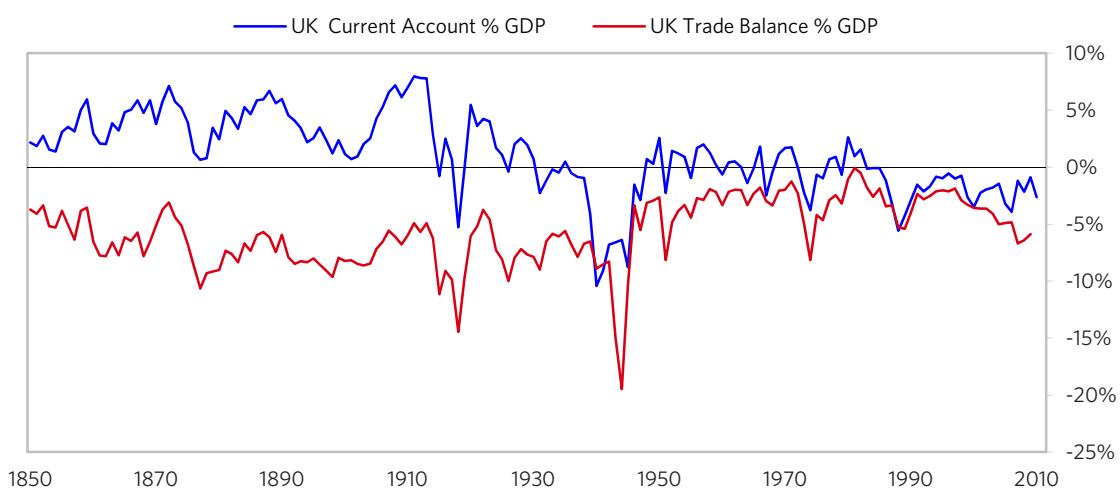
<sup>395</sup> To be clear, we are referring to the currency portion of foreign exchange reserves, as the largest component of total reserves through most of this period was gold.



The decline of the British Empire can be seen via the worsening of its twin deficits.

The next chart shows the UK current account and trade balance going back to 1850. Note that:

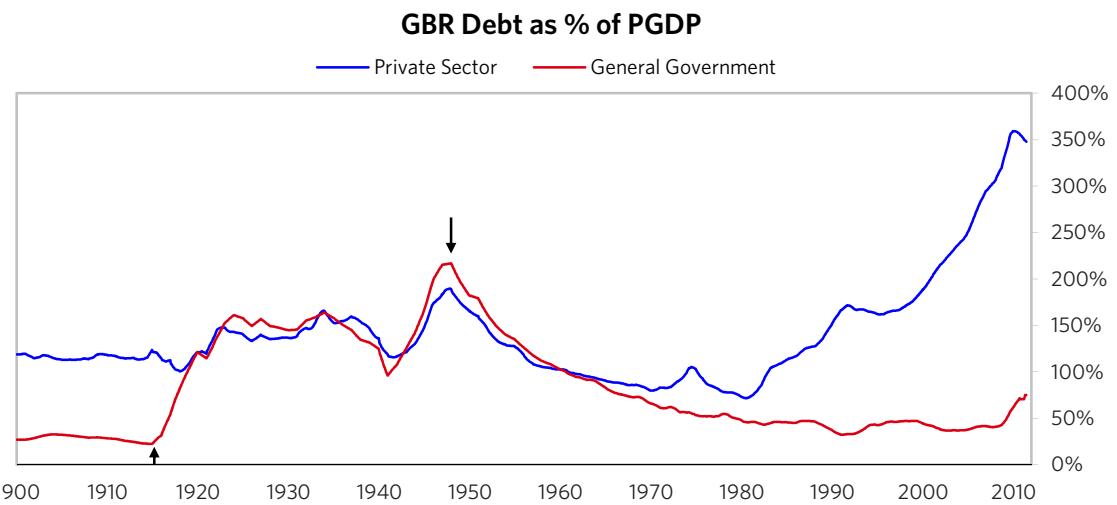
- The UK ran a strong current account surplus of about 8% of GDP until 1913, which was just prior to World War I, and then suffered steady declines worsened by both wars that led it to run large deficits (hitting 10% of GDP) at the end of World War II.
- Through most of this time (which starts in 1850, which was well into its ascent), it ran trade deficits while running current account surpluses because of the significant income earned from global asset holdings (both from colonies, and increasingly in the late 19<sup>th</sup> century from assets in the US) and the profits made from global shipping and financial businesses.
- After the First and Second World Wars, it was left with large debts owed to foreigners and without its colonies, which weakened the current account surplus significantly.



The next chart shows total debt as a percentage of GDP. Notice that it rose in two big waves, starting in 1914 and peaking in 1947—which marked the period of the decline of the British Empire. As an aside, note how it is now similar.

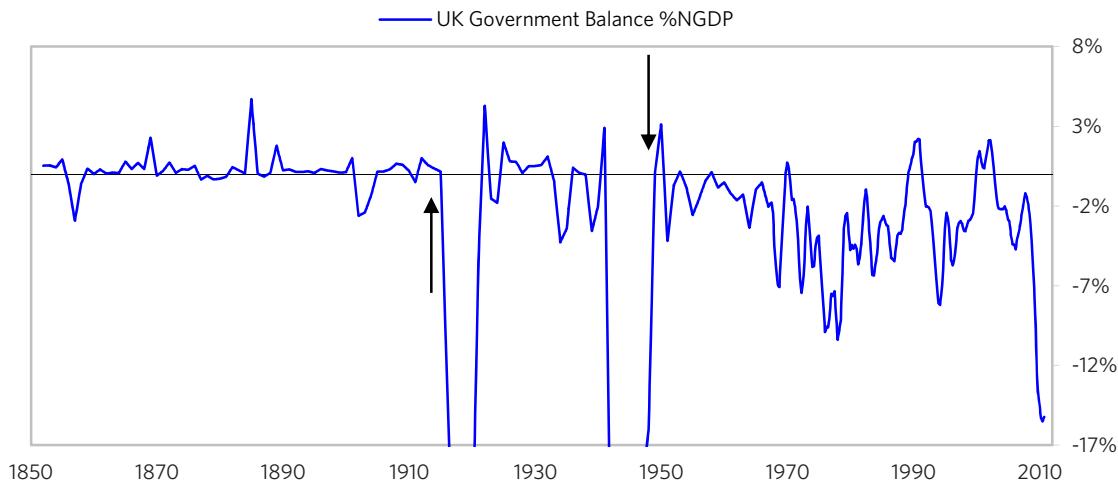


The chart below shows private and public debt burdens separately. As shown, both rose from the First World War through 1947. The increase in government debt was much more substantial and necessary to fund the two world wars.

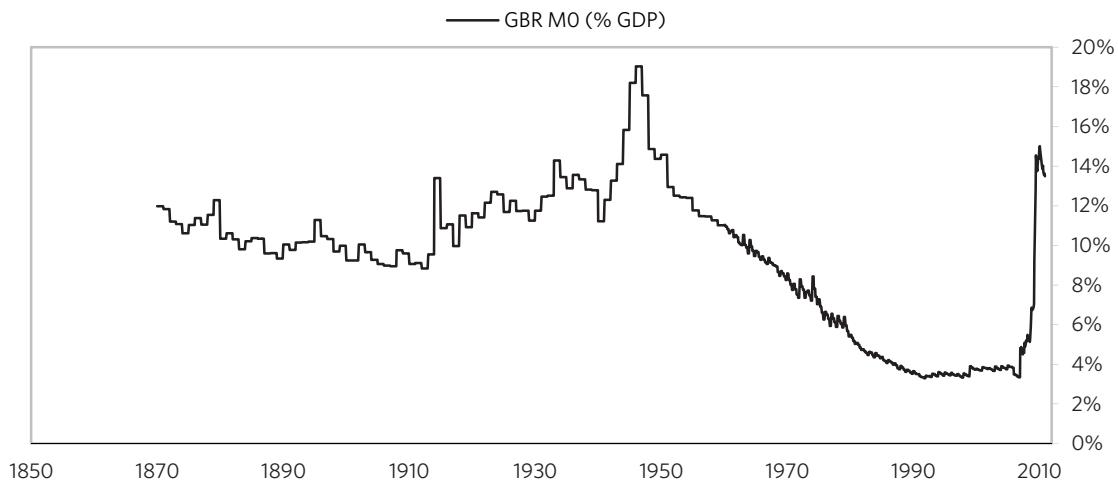


Sources: Global Financial Data & BW Estimates for charts above

The next chart shows the government's budget deficits as a percent of GDP since 1850. Government budget deficits typically shoot up for two reasons: 1) in deleveragings, when increased government spending needs to make up for decreased private sector spending, and 2) in wars. Note the effects of the two wars. Also note that the budget deficit as a percent of GDP is now the highest since World War II (because of the deleveraging).



In the charts below you will note the printing of money to help monetize these deficits and debts. Note how it recently has been similar.



Sources: Global Financial Data & BW Estimates for charts above

In a nutshell, at the end of World War II Great Britain was bankrupt and the US was in a strong financial condition. As a result, the US provided the Marshall Plan, the British Empire collapsed and the UK began a long deleveraging.

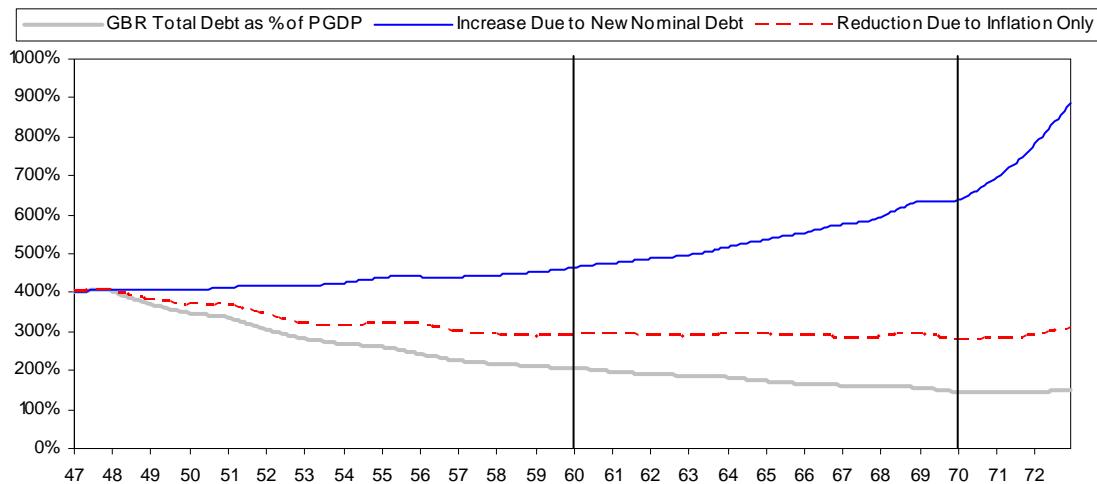
## Appendix: How the UK Deleveraging Transpired

As shown in a previous chart, the debt to GDP ratio fell from about 400% of GDP in 1947 to about 150% of GDP in 1970. How did that occur? As mentioned, in deleveragings, nominal interest rates must be kept below nominal GDP growth rates (otherwise debt to income ratios would rise even without debt growth financing increased spending) and real interest rates must be kept low, so that the rates of money growth and currency depreciation that are required to bring that about will occur. The table below shows how the most important part of this deleveraging occurred. I broke it up into two parts - from 1947 to 1959 and from 1960 to 1969 because they were a bit different.

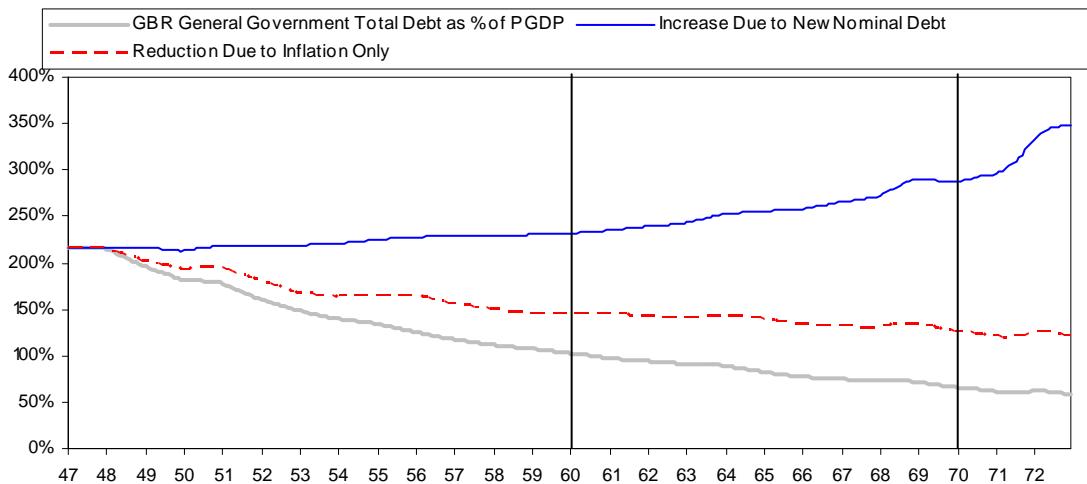
|   | 1947-1959 | 1960-1969 |
|---|-----------|-----------|
| <b>Overall Economy</b>                                  |           |           |
| GDP Growth, Avg. Y/Y                                    | 7.0%      | 6.8%      |
| Of Which:   |           |           |
| GDP Deflator  | 4.0%      | 3.6%      |
| Real  | 2.9%      | 3.1%      |
| Productivity Growth                                     | 2.4%      | 2.6%      |
| Labor Force Growth                                      | 0.5%      | 0.6%      |
| Source of Demand Contribution:                          |           |           |
| Domestic  | 5.6%      | 5.6%      |
| Foreign   | 1.4%      | 1.2%      |
| <b>Government Sector</b>                                |           |           |
| Gov't Bond Yield, Avg.                                  | 4.2%      | 6.5%      |
| Nominal Growth - Gov't Bond Yield                       | 2.8%      | 0.3%      |
| Real Yield  | 0.2%      | 2.9%      |
| Gov't Borrowing % GDP, Avg. Ann.                        | 0.7%      | 2.0%      |
| Gov't Debt Level as % GDP, Avg. Change per Year         | -9.0%     | -3.1%     |
| <b>Private Sector</b>                                   |           |           |
| Private Borrowing % GDP, Avg. Ann.                      | 2.1%      | 3.6%      |
| HHD Savings Rate, Avg. Y-Y Change (+ Means higher rate) | 0.3%      | 0.4%      |
| Pvt Sector Debt Level as % GDP, Avg. Change per Year    | -7.2%     | -2.3%     |
| <b>External</b>   |           |           |
| GBP vs USD, Avg. Y/Y                                    | -3.0%     | -1.5%     |
| Change in Reserves % of GDP, Avg. Ann.                  | 0.5%      | 0.1%      |
| Change in Current Account Level, Avg. Y-Y               | 0.3%      | 0.1%      |

Sources: Global Financial Data & BW Estimates

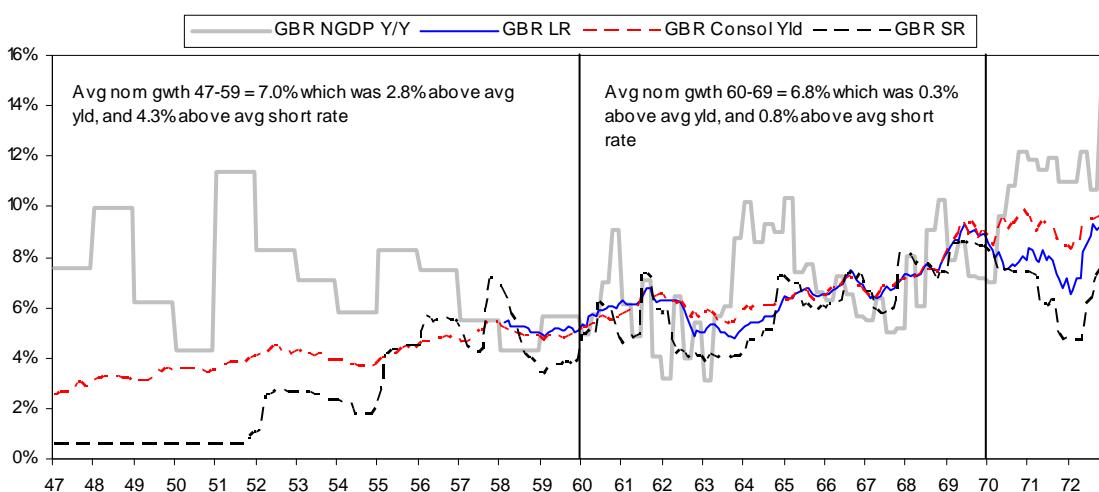
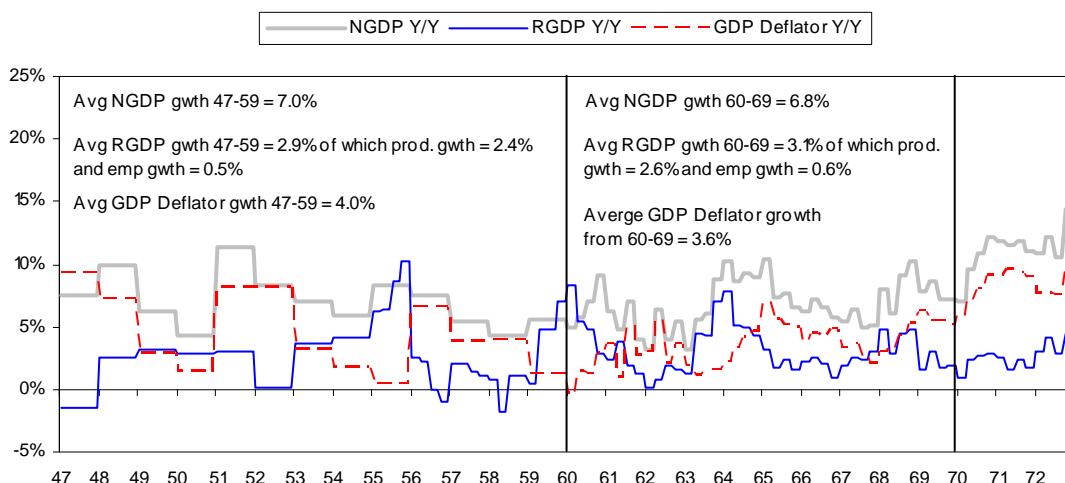
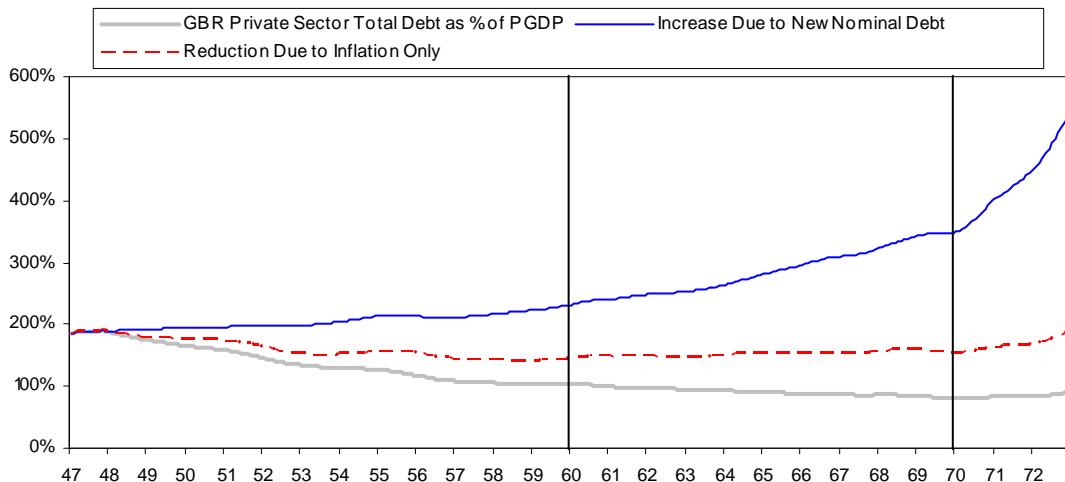
As a result of these policies, the decline in total debt in the post-war period occurred via a rise in nominal GDP which outpaced more modest increases in the amount of new borrowing. Inflation of around 4% from 1947-1970 drove nearly 2/3 of the decline in debt to GDP that is attributable to GDP growth. This is shown in the chart below.



The same is true for both the government and the private sector. The new borrowing by the government was relatively small through the period, particularly from 1947-1960. The charts below show the attributions of the changes in the debt ratios.



Sources: Global Financial Data & BW Estimates for charts above



Sources: Global Financial Data & BW Estimates for charts above

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