Economic Principles

Draft Version

How the Economic Machine Works

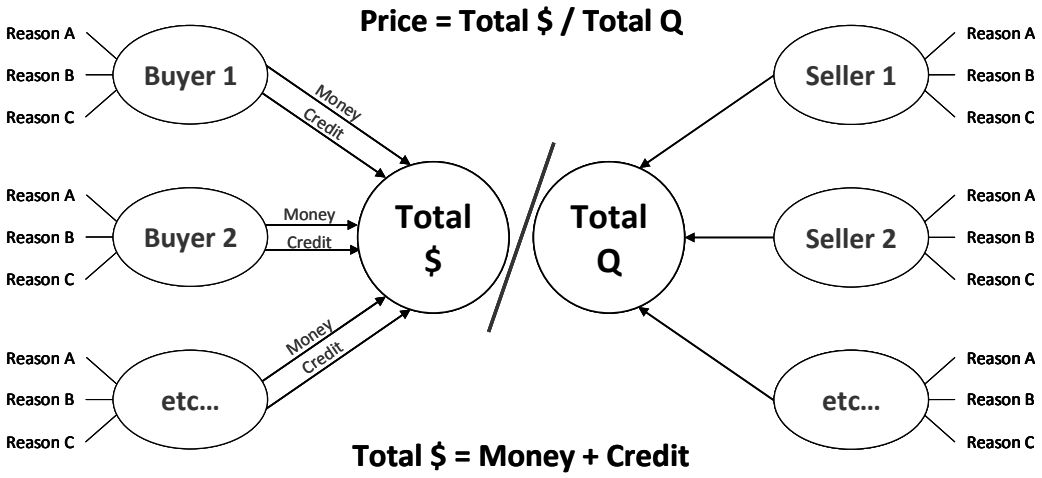
The economy is like a machine. At the most fundamental level it is a relatively simple machine. But many people don't understand it – or they don't agree on how it works – and this has led to a lot of needless economic suffering. I feel a deep sense of responsibility to share my simple but practical 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,[1] 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,[2] 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

[1] 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.
[2] 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,[3] 2) austerity, 3) redistributions of wealth, and 4) debt

[3] 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.[4] Also, in deleveragings, central governments typically spend much, much more to make up for the fall in private sector spending.

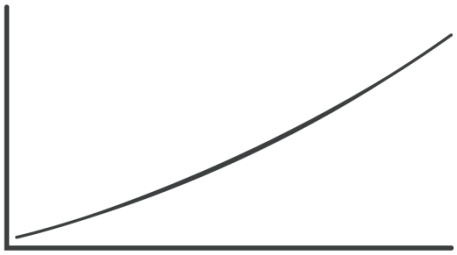
But let's not get ahead of ourselves. Since these two types of contractions are just parts of two different types of cycles that are explained more completely in this Template, let's look at the Template.

[4] 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.



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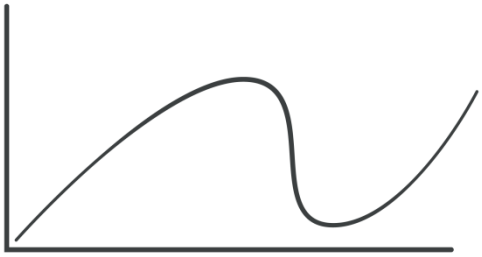


3.

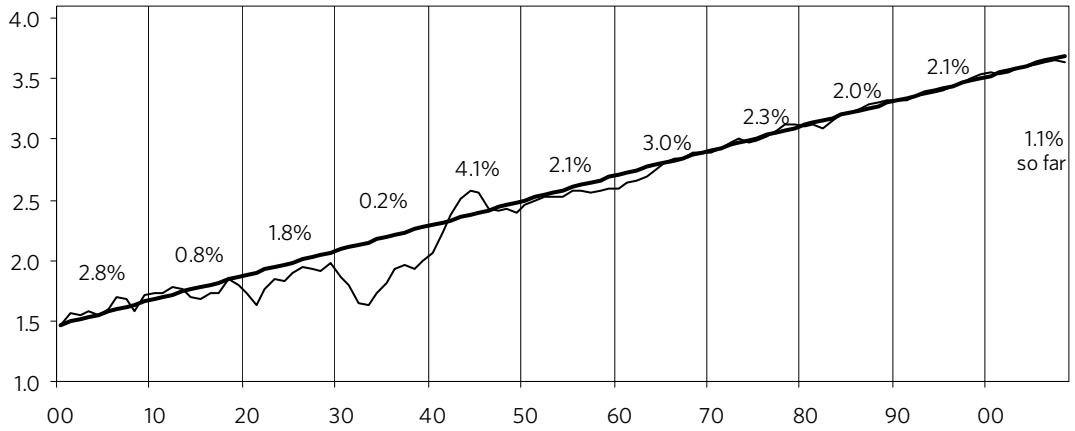
What follows is an explanation of all three of these forces and how, by overlaying the archetypical short-term debt cycle on top of the archetypical long-term debt cycle and overlaying them both on top of the productivity trend line, one can derive a good template for tracking most economic/market movements. 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.[5] 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)

[5] 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.

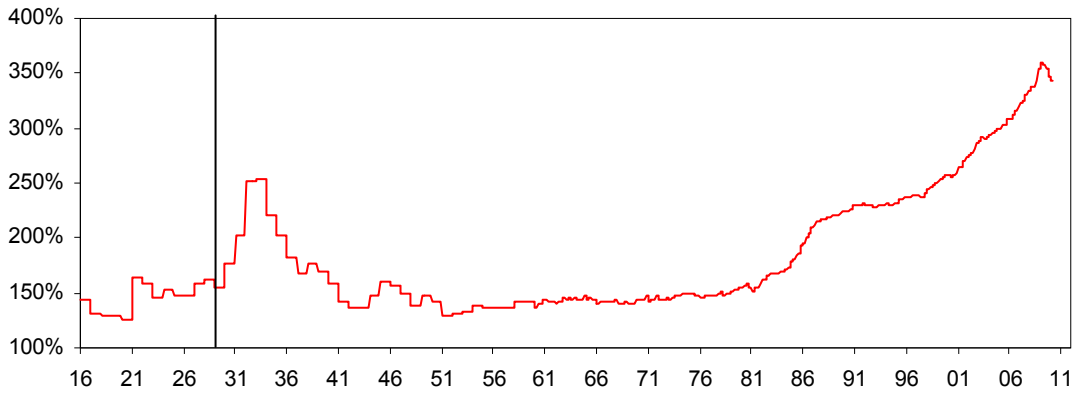
Governments typically prefer fiat systems because they offer more power to print money, expand credit and redistribute wealth by changing the value of money. Human nature being what it is, those in government (and those not) tend to value immediate gratification over longer-term benefits, so government 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



Sources: Global Financial Data & BW Estimates

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.

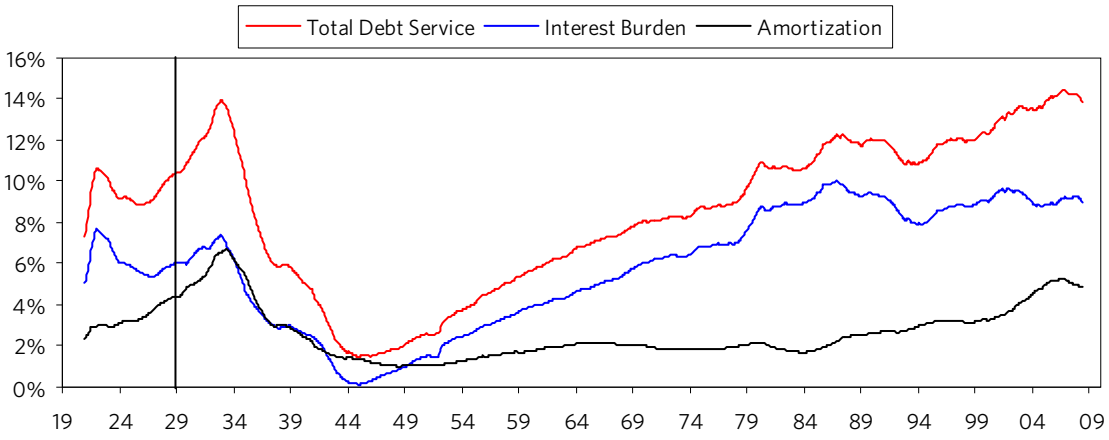
Suppose you earn $100,000, have a net worth of $100,000 and have no debt. You have the capacity to borrow $10,000/year, so you could spend $110,000 per year for a number of years, even though you only earn $100,000. For an economy as a whole, this increased spending leads to higher earnings, which supports 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[6] – 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

[6] 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.

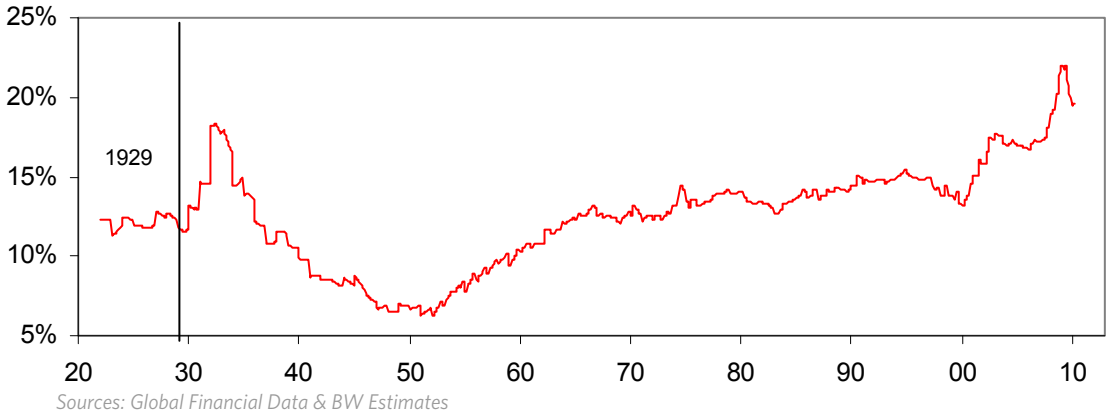
Transfers of wealth typically occur in many forms, but rarely in amounts that contribute meaningfully to the deleveraging. The differences between how deleveragings play out depends on the amounts and paces of these four measures.

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



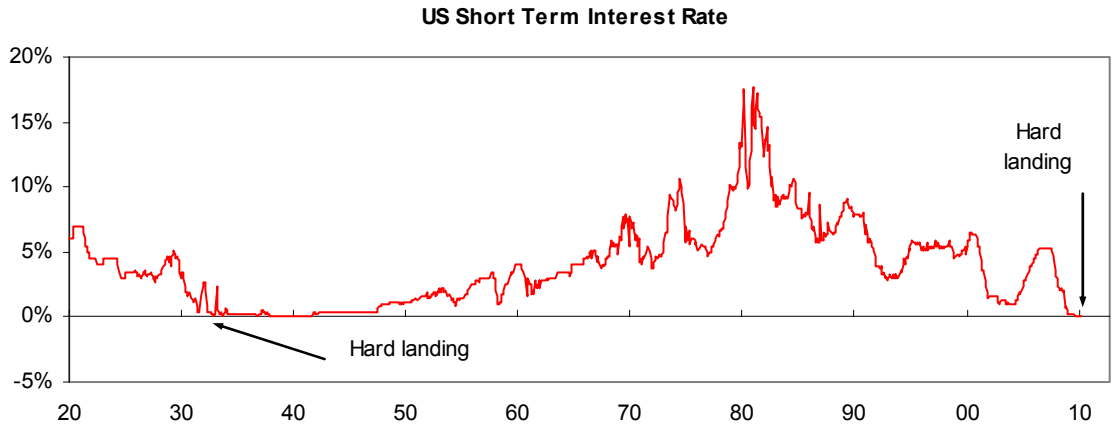
Sources: Global Financial Data & BW Estimates

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.

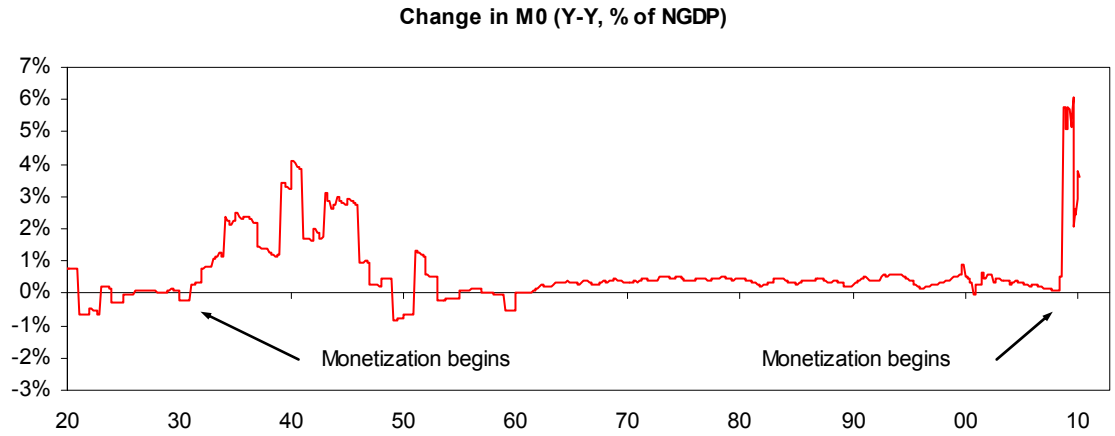
In order to try to alleviate this fundamental imbalance, governments inevitably a) create initiatives to encourage credit creation, b) ease the rules that require debtors to come up with money to service their debts (i.e., create forbearance) and, most importantly, c) print and spend money to buy goods, 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%...

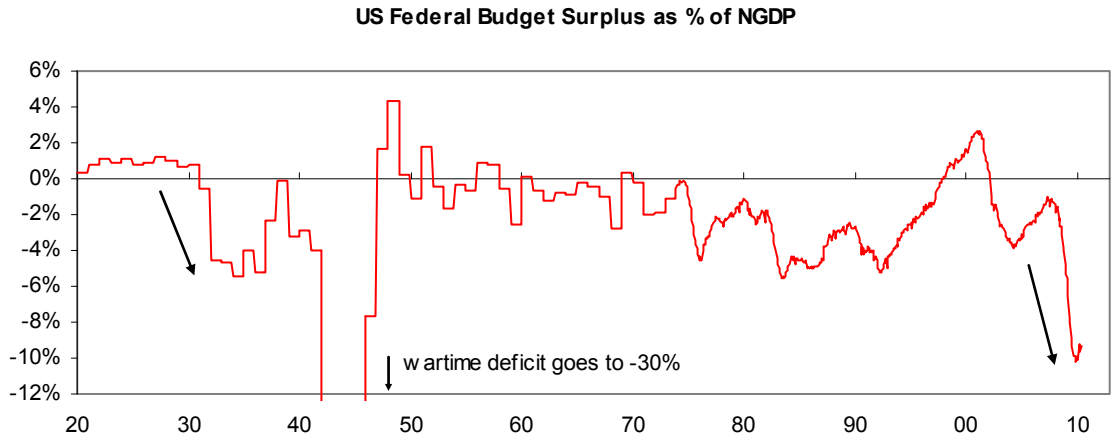


Sources: Global Financial Data & BW Estimates

...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,[7] 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

[7] 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.

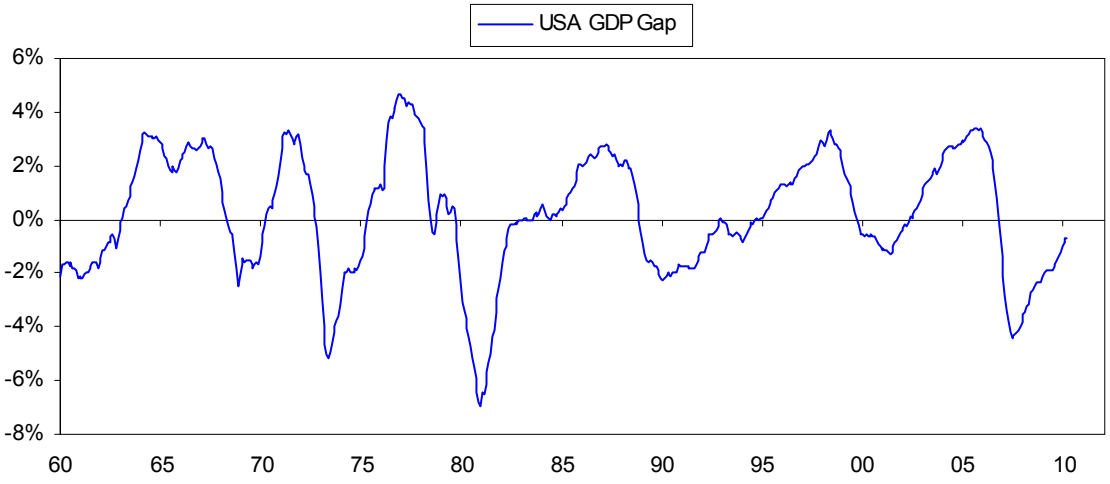
Deleveragings typically end via a mix of 1) debt reduction, 2) austerity, 3) redistributions of wealth, and 4) debt monetization. Additionally, through this process, businesses lowering their break-even levels through cost-cutting, substantial increases in risk and liquidity premiums that restore the 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[1]						
Low	Date	Nominal Change	Period (in months)	% Change	High	Date
3.96%	Oct-19	1.92%	14	49%	5.88%	Dec-20
		-3.96%	43	-67%		
1.92%	Jul-24	2.88%	64	150%	4.80%	Nov-29
		-4.80%	34	-100%		
0.0%	Sep-32	2.09%	251	#N/A	2.1%	Aug-53
		-1.44%	10	-69%		
0.65%	Jun-54	2.94%	40	452%	3.59%	Oct-57
		-2.71%	8	-75%		
0.88%	Jun-58	3.69%	18	419%	4.57%	Dec-59
		-2.30%	19	-50%		
2.27%	Jul-61	3.32%	62	146%	5.59%	Sep-66
		-2.26%	9	-40%		
3.33%	Jun-67	4.75%	30	143%	8.08%	Dec-69
		-4.08%	26	-50%		
4.00%	Feb-72	7.00%	28	175%	11.00%	Jun-74
		-6.25%	30	-57%		
4.75%	Dec-76	11.75%	39	247%	16.50%	Mar-80
		-5.50%	5	-33%		
11.00%	Aug-80	8.00%	9	73%	19.00%	May-81
		-11.00%	18	-58%		
8.00%	Nov-82	3.44%	21	43%	11.44%	Aug-84
		-5.56%	26	-49%		
5.88%	Oct-86	3.87%	31	66%	9.75%	May-89
		-6.75%	40	-69%		
3.00%	Sep-92	3.50%	99	117%	6.50%	Dec-00
		-5.50%	30	-85%		
1.00%	Jun-03	4.25%	50	425%	5.25%	Aug-07
		-3.00%	13	-57%		
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.

Productivity and Structural Reform: Why Countries Succeed & Fail, and What Should Be Done So Failing Countries Succeed

by Ray Dalio

In this report 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 both a reliable prognosis for each of these country's growth rates over the next 10 years and a reliable formula for success. By looking at these cause-effect relationships in much the same way as a doctor looks at one's genetics, blood tests and regimes for exercise and diet, we can both see each country's health prospects and know what changes each can make 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 as a machine and look at the relationships of cholesterol and heart attacks analytically rather than ideologically.

The Template

This study 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 70 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 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 70 years within 2% of the realized growth about 85% of the time and within 1% two-thirds of the time, with the average miss of less than 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 150 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 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 worth, 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 10 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

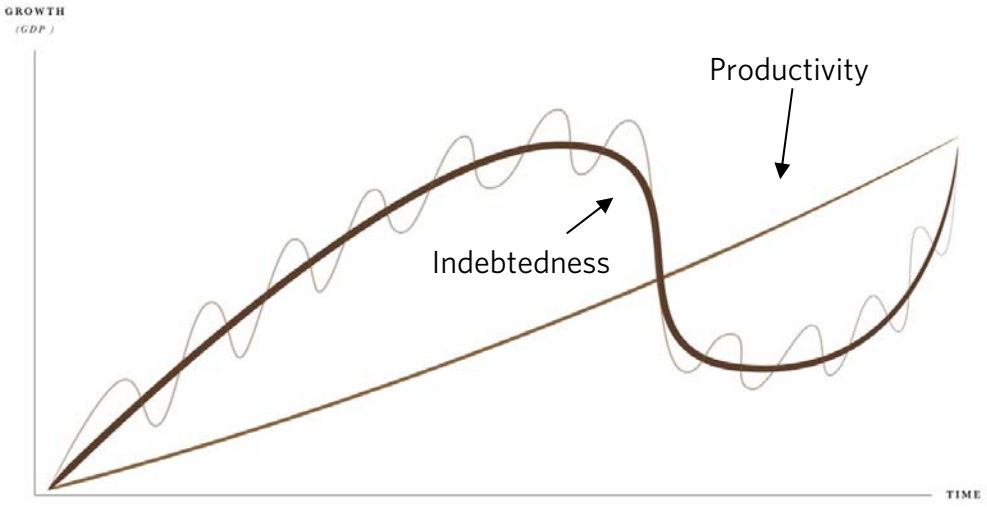
While productivity and indebtedness can be thought of as separate concepts, they are ultimately a function of the choices people make and their psychology. I briefly touched on culture as an influence on these choices and their outcomes. Also, I observe important shifts in attitudes from one generation 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 a simple logic-weighted index of productivity and 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.[380] 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 86% correlated with the countries' subsequent growth rates. Below we show how well these measures related to future growth across countries and time.[381]

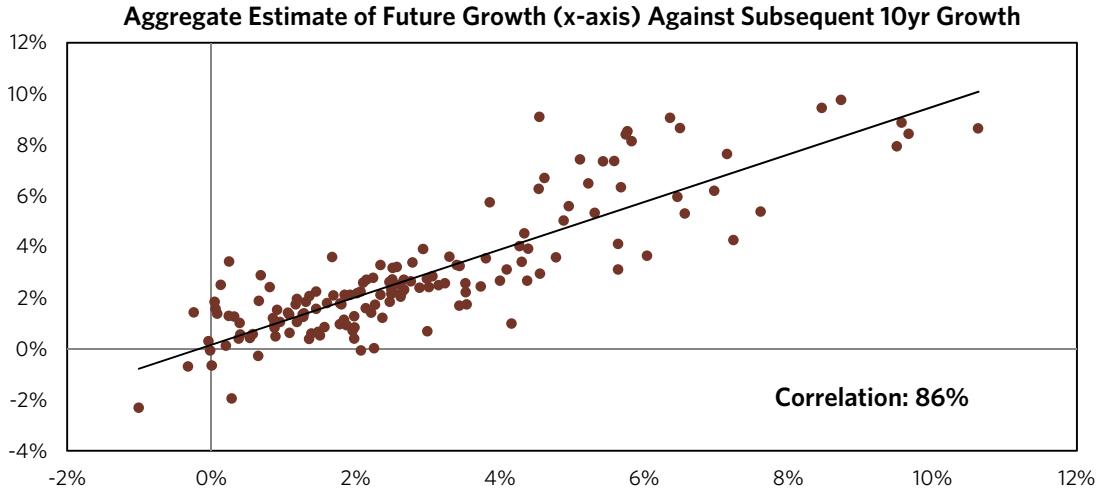
Future Growth Estimate - A Summary of Our Reasons			
Concept	**Gauge**	**Weight**	**Correlation**
Aggregate Estimate	-	**100%**	**86%**
Productivity: Producing more by working harder or smarter.	-	**65%**	**71%**
I. Value: What You Pay vs What You Get: Countries that offer the most value for money do better than those that don't. The most important attributes are whether their people work hard, invest, and are educated and productive in their jobs.	-	**45%**	**67%**
i. Education: 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%**
ii. Labor Productivity: A worker of similar education who produces more in the same amount of time is more attractive than the one producing less.	Cost of a Productivity-Adjusted Educated Worker	**11%**	**57%**
iii. Working Hard: 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 pcs)	**11%**	**64%**
iv. Investing: Countries that save and invest in productive capital and infrastructure will improve their potential more than those that don't.	Investing Relative to Income (2 pcs)	**11%**	**58%**
II. Culture: Culture influences the choices people make and the effectiveness of an economic system.	-	**20%**	**62%**
i. Self-Sufficiency: The need and the ability to independently support oneself is healthy and important to being successful.	Self-Sufficiency ex-Inc (3 pcs, 9 sub-pcs)	**3%**	**42%**
ii. Savoring Life vs. Achieving: Those who value achievement over savoring the fruits of life will be more successful in finding ways to work harder and smarter.	Savoring vs Achieving ex-Inc (2 pcs, 8 sub-pcs)	**3%**	**37%**
iii. Innovation & Commercialism: 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%**	**65%**
iv. Bureaucracy: Lots of red tape and regulation stymies business activity.	Bureaucracy ex-Inc (3 sub-pcs)	**3%**	**43%**
v. Corruption: Corruption deters investment and distorts market incentives.	Corruption ex-Inc (4 sub-pcs)	**3%**	**63%**
vi. Rule of Law: Investors and business people need to feel secure their agreements and property will be protected.	Rule of Law ex-Inc (4 sub-pcs)	**3%**	**59%**
Indebtedness: Swings in credit drive swings in spending and economic growth.	-	**35%**	**49%**
I. Debt and Debt Service Levels: Countries with high debt burdens have less room to leverage and take on new debt.	Debt and Debt Service Levels	**12%**	**41%**
II. Debt Flow: 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%**	**-12%**
III. Monetary Policy: Monetary policy can make new borrowing more or less attractive.	Monetary Policy	**18%**	**25%**

[380] 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.

[381] My approach to research is to first think through what makes sense to me and then 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're likewise in the range of 80-90% correlated with future growth depending on the process used).

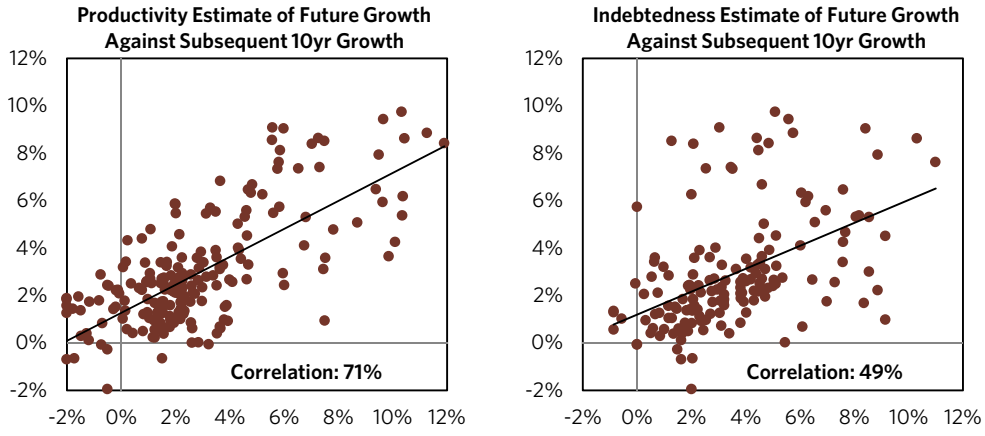
These measures of productivity and indebtedness can be used to predict each country's absolute and relative growth rates over the next 10 years, or longer periods. They also can be used by policy makers to indicate what levers they can move to influence future growth. To reiterate, my goal is to get 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 150 separate observations across 20 different countries over the last 70 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 growth two-thirds of the time, and within 2% about 85% of the time.



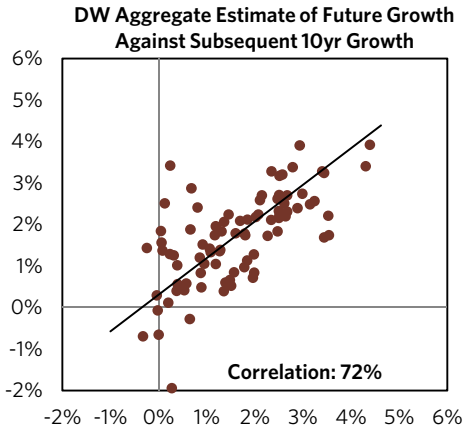
Note: For periods where we have productivity and indebtedness. 150 data points over 20 countries.

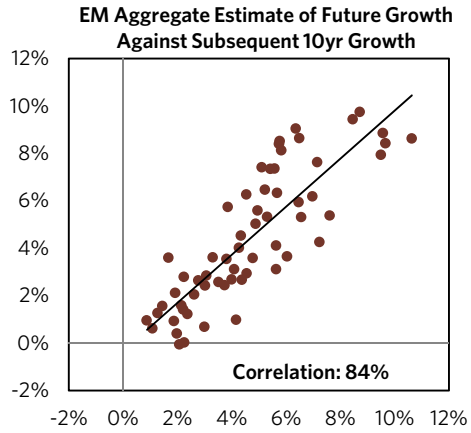
Below we show the same perspective for each of our productivity and indebtedness gauges, comparing what they implied individually for a country's growth versus what happened. As you can see our measure of productivity is more strongly correlated with each country's growth than our indebtedness measure is (71% versus 49%), which makes sense given it is the more important driver over the timeframes tested. Still, each has a fairly good relationship on its own.



Note: Growth is measured as growth in income per worker in above charts

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 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 (72% correlated with the growth in income per worker in developed countries and 84% 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.





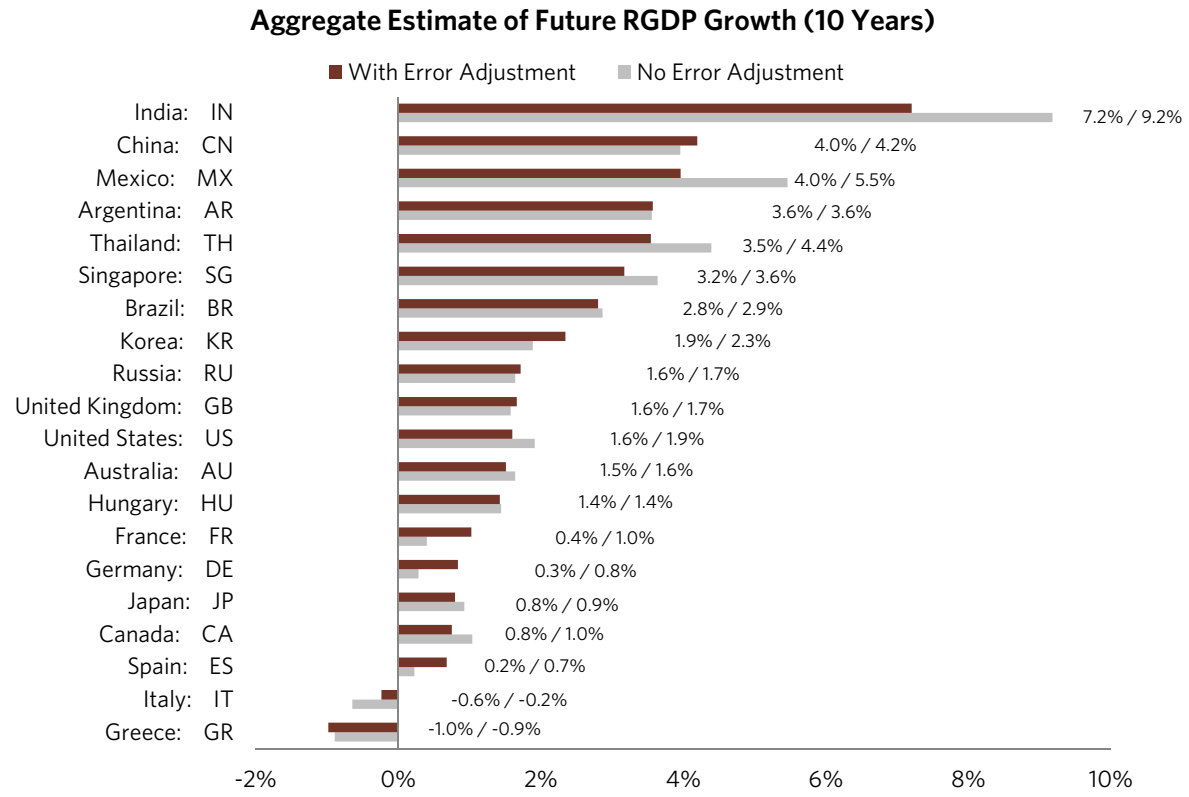
To reiterate, I believe getting to this fundamental level is critical to understanding and predicting the growth of countries. Naïve measures of a country's future growth—for example just income on its own or a country's trailing growth—won't get you much because they won't help you get at the drivers. 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 go into greater depth on the reasons behind them in Appendix A.

The following chart shows our estimate in aggregate for real GDP growth over 10 years 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.[382] We simply found how much the universal formula was off in the past on average (i.e., 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 don't affect the order of the countries' rankings much.



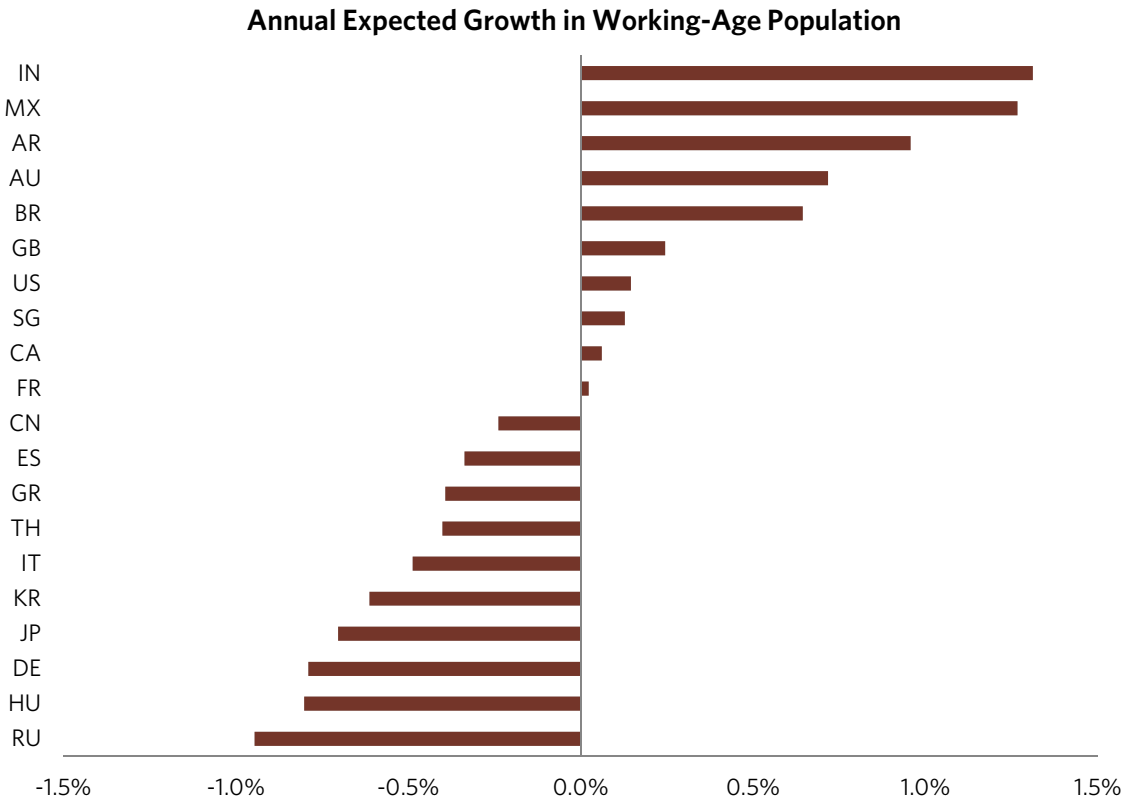
[382] Note: In studying our misses, we realized that sometimes for a given country we were systematically over-optimistic about its growth or pessimistic. Overall these biases are pretty small but they also raise the question of whether we are missing a specific factor that is particularly important for that country (we know we can't capture everything). The correlation shown above of 86% 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 79% (i.e., a 79% 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 150 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.

On the basis of productivity and indebtedness alone, the countries which have the elements to grow incomes per worker fastest today are India, China, Mexico, Argentina, and Thailand. Based on these elements, peripheral European countries and Canada are expected to grow slowest. We expect India to grow strongly (7% 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 $1,500, four times 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 a little over 4% 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.

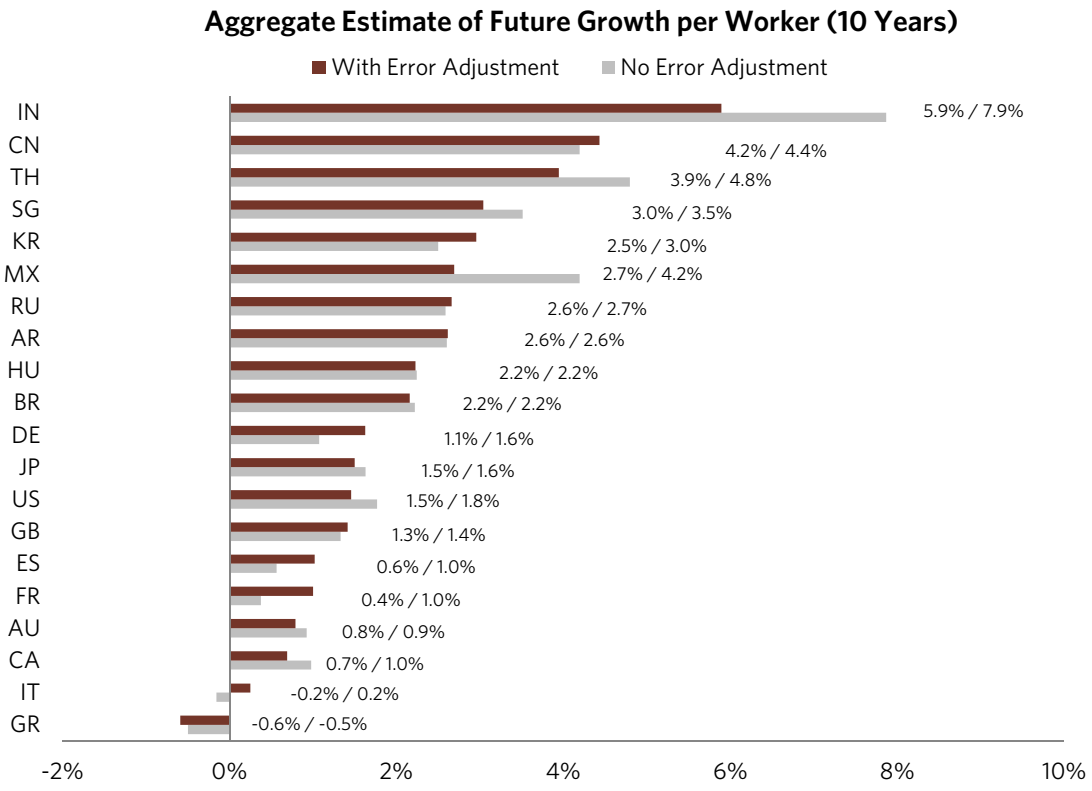
This formula projects productivity growth in the US to be around 1.6%-1.9%, in the middle of the pack globally, and near the top of the list for other rich nations. The US has fallen a bit behind other competitive world economies; in the last few years, rising incomes and falling innovation have primarily acted as a downward pressure on US growth, in addition to a well-educated but expensive workforce, and a shifting preference among American workers 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, though central bank (ECB) stimulation is more stimulative at this point, and this combined with its relatively low levels of debt should act as a tailwind for growth. Healthy household savings rates, a culture of innovation and commercialism, and good governance are all also positive supports for Germany's growth. On the lowest end we see 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, though this has been shifting in recent years with aggressive easing by the ECB. 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.

How We Came to Our Estimates

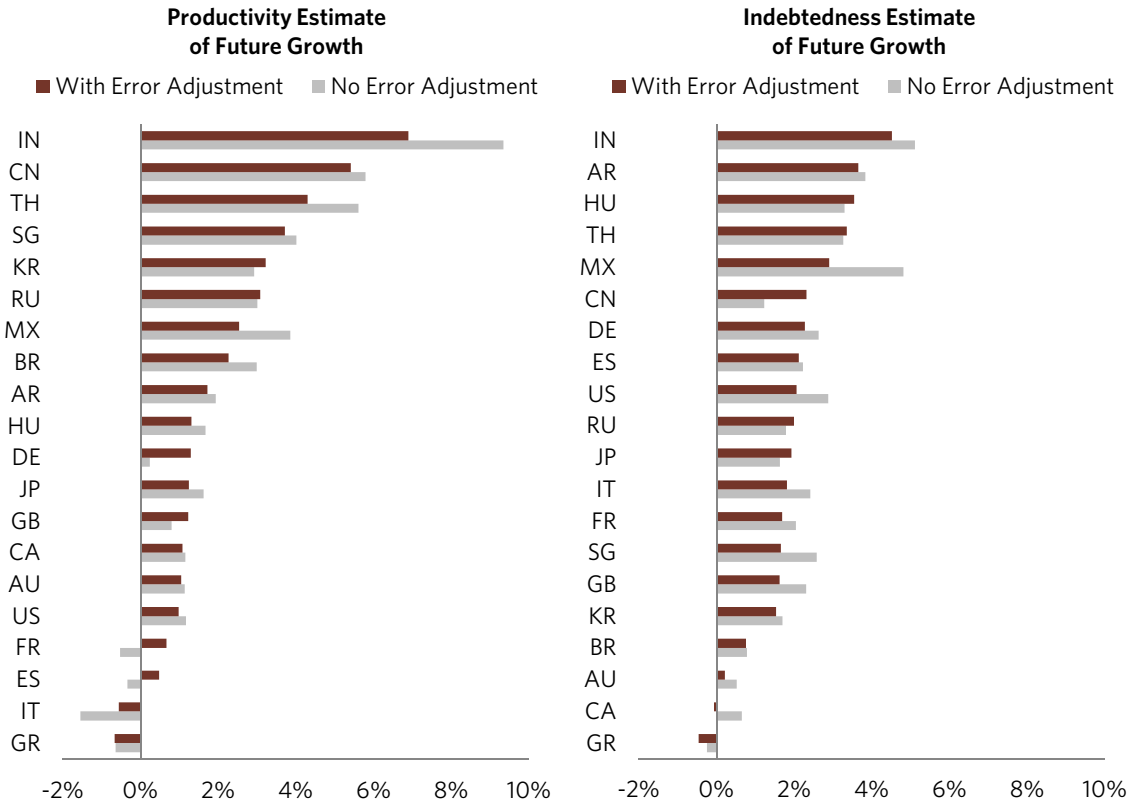
Because GDP is just output per worker times the number of workers, that estimate includes two major pieces: demographic trends (or, more specifically, the expected change in workers), and an estimate of future growth per worker. We show the chart of the expected change in workers below. On this measure, 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 supporting their potential growth.



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 more limited room for spending and income growth to come from credit expansion.



In the following section, we describe in depth our measures of productivity—both what you pay for what you get, and culture. For a detailed review of all of our underlying indicators, see Appendix A.

Productivity and Competiveness Measures

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 toward 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.

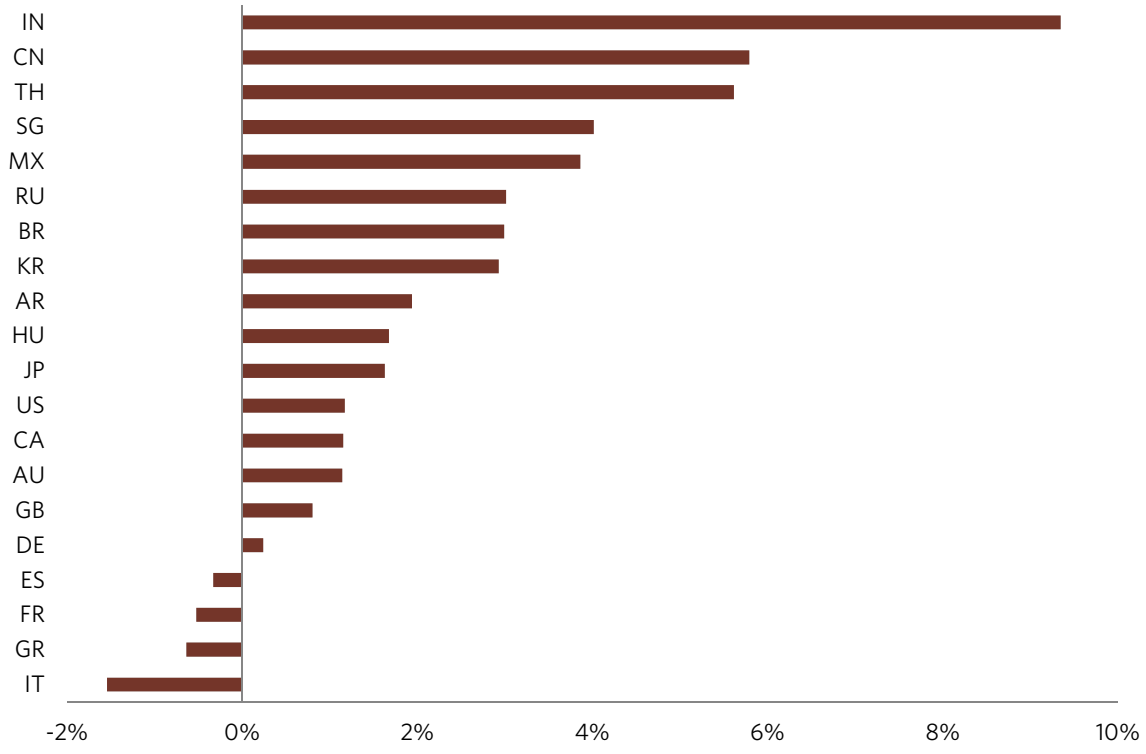
Together our indicators of productivity were 71% related to countries' subsequent growth rates. To repeat, these estimates were made by applying the exact same factors to all countries in all time periods to determine their subsequent growth.

Productivity	Correlation	Contribution to Estimate
Aggregate	**71%**	**65%**
Value: What You Pay vs What You Get	67%	45%
Cost of a Quality-Adjusted Educated Worker	66%	11.3%
Cost of a Productivity-Adjusted Educated Worker	57%	11.3%
Working Hard Relative to Income (2 pieces)	64%	11.3%
Investing Relative to Income (2 pieces)	58%	11.3%
Culture	62%	20%
Self-Sufficiency ex-Income Effect (3 pieces, 9 sub-pieces)	42%	3.3%
Savoring Life vs Achieving ex-Inc (2 pieces, 8 sub-pieces)	37%	3.3%
Innovation & Commercialism ex-Inc (2 pieces, 10 sub-pieces)	65%	3.3%
Bureaucracy ex-Inc (3 pieces)	43%	3.3%
Corruption ex-Inc (4 pieces)	63%	3.3%
Rule of Law ex-Inc (4 pieces)	59%	3.3%

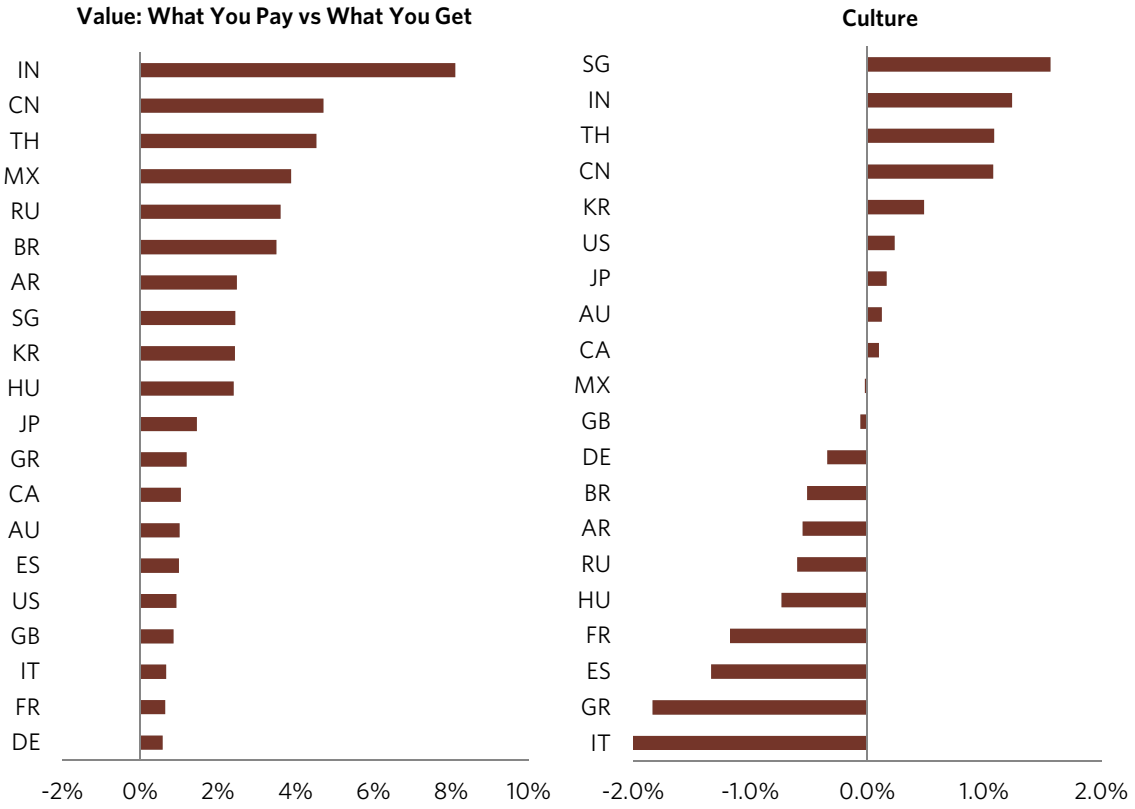
The chart below gives a picture of how we would rate countries today on productivity based on the same logic described above. Our ratings are represented in terms of what a given country's productivity would imply for that country's future growth in income per worker over the next 10 years.

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, etc. 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%. 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, 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, Greece, France, and Spain uniquely uncompetitive (we explain our reasoning in detail in Appendix A). 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 have seen some structural reforms to improve productivity and competitiveness, especially in Spain, and that such reforms have the potential to considerably boost growth because the barriers that reforms would bring down are drags on growth. Japan is the most competitive of the major developed countries we measure, especially after recent declines in Japan's exchange rate.

Productivity Estimate of Future Growth



The following two charts give you a summary of where each country stands on our assessment of value (i.e., what you pay for what you get) and whether its culture is 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.



For a fuller description of the components that make up our estimates, please see Appendix A. Next, we walk through our health indices for each country.

Part 2: Economic Health Indices by Country, and the Prognoses That They Imply

While in Part 1 I explained how the economic health index worked, in this part I break it down 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 a deeper explanation of the thinking behind each indicator, please see Appendix A. If you just want to see the individual statistics behind these gauges, you can find them in Appendix B. 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.

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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 7.2% 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 5.9% growth rate per worker, which is well above the global average, and a labor force growth rate of 1.3% which will boost growth. 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 that 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 9.3% on its own), and indebtedness conditions to be better than other countries (implying a growth rate of 5.1% 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 (though compared to other countries it doesn't rate especially poorly on this measure). The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: India

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**7.2% to 9.2%**		1
Growth in Working-Age Population :	**1.3%**		1
Projected Real Growth per Worker :	**5.9%**		1
Component of Growth per Worker Estimate	*Weight*		
Productivity	65%		1
I. Value: What You Pay vs What You Get	70%		1
i. Education	25%		1
ii. Labor Productivity	25%		1
iii. Working Hard	25%		1
a. Avg Hours Worked	67%		1
b. Demographics	33%		1
iv. Investing	25%		1
a. Investment ex-Housing	50%		1
b. Household Savings	50%		1
II. Culture	30%		2
i. Self-Sufficiency	17%		4
a. Work Ethic	50%		4
b. Government Support	25%		8
c. Rigidity of Labor Market	25%		5
ii. Savoring Life vs Achieving	17%		3
a. Observed Outcomes (Work Ethic)	50%		4
b. Expressed Values	50%		2
iii. Innovation & Commercialism	17%		1
a. Outputs (e.g., patents, trademarks)	50%		1
b. Inputs (e.g., R&D, # of researchers)	50%		3
iv. Bureaucracy	17%		14
v. Corruption	17%		1
vi. Rule of Law	17%		4
Indebtedness	35%		1
I. Debt and Debt Service Levels	35%		4
II. Debt Flow	15%		8
III. Monetary Policy	50%		7

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 that 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 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 who 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 36 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 significant support to growth in coming years, 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 very strong in India relative to income. We see the country investing very heavily in research and innovation, and its outputs from innovation, including inventions and earnings, are very high. Finally, relative to its income, India has somewhat high bureaucracy and red tape, very low corruption, and somewhat strong rule of law, according to the international measures we are using.

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 bit of room to lever up in the future, with a total debt burden of around 133% 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 4.0% to 4.2%. 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 4.4% growth rate per worker, which is well above the global average, and a labor force growth rate of -0.2% which will moderately weigh on growth. 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 that 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 5.8% on its own), and indebtedness conditions to be slightly worse than other countries (implying a growth rate of 1.2% 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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: China

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**4.0% to 4.2%**		2
Growth in Working-Age Population :	**-0.2%**		11
Projected Real Growth per Worker :	**4.4%**		2
Component of Growth per Worker Estimate	*Weight*		
Productivity	65%		2
I. Value: What You Pay vs What You Get	70%		2
i. Education	25%		3
ii. Labor Productivity	25%		4
iii. Working Hard	25%		4
a. Avg Hours Worked	67%		3
b. Demographics	33%		6
iv. Investing	25%		2
a. Investment ex-Housing	50%		1
b. Household Savings	50%		1
II. Culture	30%		4
i. Self-Sufficiency	17%		6
a. Work Ethic	50%		7
b. Government Support	25%		4
c. Rigidity of Labor Market	25%		9
ii. Savoring Life vs Achieving	17%		2
a. Observed Outcomes (Work Ethic)	50%		7
b. Expressed Values	50%		4
iii. Innovation & Commercialism	17%		2
a. Outputs (e.g., patents, trademarks)	50%		2
b. Inputs (e.g., R&D, # of researchers)	50%		2
iv. Bureaucracy	17%		6
v. Corruption	17%		2
vi. Rule of Law	17%		2
Indebtedness	35%		16
I. Debt and Debt Service Levels	35%		8
II. Debt Flow	15%		20
III. Monetary Policy	50%		11

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 that 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 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 who 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 poor quality of education. Further, people in China work an average amount 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 unfavorable. 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, 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 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 29% of GDP), and its labor markets are very flexible. China 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 very 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, relative to its income, China has somewhat low bureaucracy and red tape, very low corruption, and very strong rule of law, according to the international measures we are using.

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.*

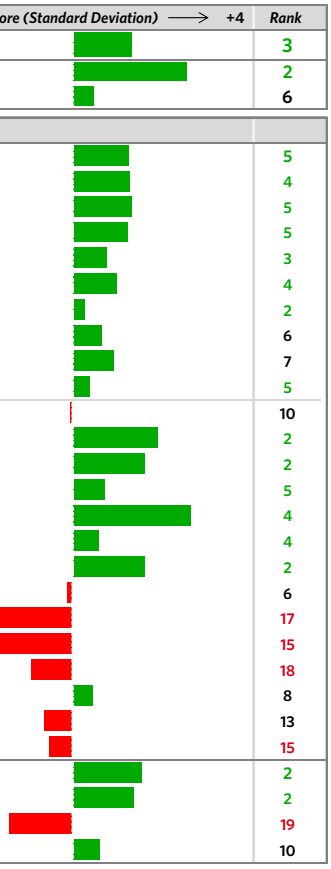
The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. China's indebtedness position is slightly worse than other countries, ranked 16 out of the 20 countries we look at. The country has very little room to lever up in the future, with a total debt burden of around 249% 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 4.0% to 5.5%. This growth rate is well above the global average, ranked 3 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 2.7% growth rate per worker, which is somewhat above the global average, and a labor force growth rate of 1.3% which will boost growth. 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 that 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 4.8% 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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Mexico

		-4 ← Score (Standard Deviation) → +4	Rank
Projected 10-Year Real Growth Rate :	**4.0% to 5.5%**		3
Growth in Working-Age Population :	**1.3%**		2
Projected Real Growth per Worker :	**2.7%**		6
Component of Growth per Worker Estimate	*Weight*		
Productivity	65%		5
I. Value: What You Pay vs What You Get	70%		4
i. Education	25%		5
ii. Labor Productivity	25%		5
iii. Working Hard	25%		3
a. Avg Hours Worked	67%		4
b. Demographics	33%		2
iv. Investing	25%		6
a. Investment ex-Housing	50%		7
b. Household Savings	50%		5
II. Culture	30%		10
i. Self-Sufficiency	17%		2
a. Work Ethic	50%		2
b. Government Support	25%		5
c. Rigidity of Labor Market	25%		4
ii. Savoring Life vs Achieving	17%		4
a. Observed Outcomes (Work Ethic)	50%		2
b. Expressed Values	50%		6
iii. Innovation & Commercialism	17%		17
a. Outputs (e.g., patents, trademarks)	50%		15
b. Inputs (e.g., R&D, # of researchers)	50%		18
iv. Bureaucracy	17%		8
v. Corruption	17%		13
vi. Rule of Law	17%		15
Indebtedness	35%		2
I. Debt and Debt Service Levels	35%		2
II. Debt Flow	15%		19
III. Monetary Policy	50%		10



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 that 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 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 who 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 somewhat high 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, ranked 10 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 28% 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 very low. Finally, relative to its income, Mexico has average levels of bureaucracy and red tape, somewhat high corruption, and somewhat weak rule of law, according to the international measures we are using.

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 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 101% 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.

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 3.6%. This growth rate is well above the global average, ranked 4 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 Argentina's case, our growth estimate comes from combining our expectation of a 2.6% growth rate per worker, which is somewhat above the global average, and a labor force growth rate of 1.0% which will boost growth. 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 that 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 1.9% 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 monetary policy and its levels of investment (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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Argentina

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**3.6%**		4
Growth in Working-Age Population :	**1.0%**		3
Projected Real Growth per Worker :	**2.6%**		8
Component of Growth per Worker Estimate	*Weight*		
Productivity	**65%**		9
I. Value: What You Pay vs What You Get	**70%**		7
i. Education	**25%**		9
ii. Labor Productivity	**25%**		8
iii. Working Hard	**25%**		6
a. Avg Hours Worked	67%		6
b. Demographics	33%		4
iv. Investing	**25%**		12
a. Investment ex-Housing	50%		17
b. Household Savings	50%		-
II. Culture	**30%**		14
i. Self-Sufficiency	**17%**		10
a. Work Ethic	50%		8
b. Government Support	25%		6
c. Rigidity of Labor Market	25%		18
ii. Savoring Life vs Achieving	**17%**		10
a. Observed Outcomes (Work Ethic)	50%		8
b. Expressed Values	50%		16
iii. Innovation & Commercialism	**17%**		8
a. Outputs (e.g., patents, trademarks)	50%		8
b. Inputs (e.g., R&D, # of researchers)	50%		8
iv. Bureaucracy	**17%**		16
v. Corruption	**17%**		18
vi. Rule of Law	**17%**		18
Indebtedness	**35%**		3
I. Debt and Debt Service Levels	**35%**		1
II. Debt Flow	**15%**		9
III. Monetary Policy	**50%**		19

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 that 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 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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Argentina offers around average value, ranked 7 among the countries we measure. Its workers are somewhat inexpensive, even taking into consideration Argentina's low levels of education and 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 30 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 about average 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 headwind to growth in coming years, ranked 14 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 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 36% of GDP), and its labor markets are moderately 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, relative to its income, Argentina has somewhat high bureaucracy and red tape, somewhat high corruption, and somewhat weak rule of law, according to the international measures we are using.

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 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 77% 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 tight.

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 3.5% to 4.4%. This growth rate is somewhat above the global average, ranked 5 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 Thailand's case, our growth estimate comes from combining our expectation of a 3.9% growth rate per worker, which is well above the global average, and a labor force growth rate of -0.4% which will moderately weigh on growth. 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 that 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 5.6% on its own), and indebtedness conditions to be slightly better than other countries (implying a growth rate of 3.3% on its own). As shown below, Thailand'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 reliance on credit flows for growth and its monetary policy (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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Thailand

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**3.5% to 4.4%**		5
Growth in Working-Age Population :	**-0.4%**		14
Projected Real Growth per Worker :	**3.9%**		3
Component of Growth per Worker Estimate	*Weight*		
Productivity	**65%**		3
I. Value: What You Pay vs What You Get	**70%**		3
i. Education	**25%**		4
ii. Labor Productivity	**25%**		3
iii. Working Hard	**25%**		2
a. Avg Hours Worked	67%		2
b. Demographics	33%		5
iv. Investing	**25%**		3
a. Investment ex-Housing	50%		4
b. Household Savings	50%		4
II. Culture	**30%**		3
i. Self-Sufficiency	**17%**		3
a. Work Ethic	50%		3
b. Government Support	25%		3
c. Rigidity of Labor Market	25%		10
ii. Savoring Life vs Achieving	**17%**		5
a. Observed Outcomes (Work Ethic)	50%		3
b. Expressed Values	50%		13
iii. Innovation & Commercialism	**17%**		5
a. Outputs (e.g., patents, trademarks)	50%		6
b. Inputs (e.g., R&D, # of researchers)	50%		4
iv. Bureaucracy	**17%**		2
v. Corruption	**17%**		4
vi. Rule of Law	**17%**		3
Indebtedness	**35%**		5
I. Debt and Debt Service Levels	**35%**		5
II. Debt Flow	**15%**		12
III. Monetary Policy	**50%**		13

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 that 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 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 who 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 very poor quality of education. Further, people in Thailand work hard relative to the cost of their labor—the average male of working age works 36 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 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, 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 somewhat strong work ethic, its level of government support is low (with government outlays at 22% of GDP), and its labor markets are very flexible. Thailand 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 Thailand relative to income. We see the country investing very heavily in research and innovation, though its outputs from innovation, including inventions and earnings, are low. Finally, relative to its income, Thailand has very low bureaucracy and red tape, somewhat low corruption, and very strong rule of law, according to the international measures we are using.

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 5 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 192% 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.

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 3.2% to 3.6%. This growth rate is somewhat above the global average, ranked 6 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 3.0% growth rate per worker, which is well above the global average, and a labor force growth rate of 0.1% which will moderately boost growth. 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 that 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 4.0% on its own), and indebtedness conditions to be slightly better than other countries (implying a growth rate of 2.6% on its own). As shown below, Singapore's biggest relative strengths are its rule of law and its level of bureaucracy, and its biggest relative problems are how hard its people work and its debt and debt service levels. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Singapore

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**3.2% to 3.6%**		**6**
Growth in Working-Age Population :	**0.1%**		**8**
Projected Real Growth per Worker :	**3.0%**		**4**
Component of Growth per Worker Estimate	*Weight*		
Productivity	65%		4
I. Value: What You Pay vs What You Get	70%		8
i. Education	25%		10
ii. Labor Productivity	25%		11
iii. Working Hard	25%		8
a. Avg Hours Worked	67%		7
b. Demographics	33%		20
iv. Investing	25%		5
a. Investment ex-Housing	50%		5
b. Household Savings	50%		-
II. Culture	30%		1
i. Self-Sufficiency	17%		1
a. Work Ethic	50%		1
b. Government Support	25%		1
c. Rigidity of Labor Market	25%		1
ii. Savoring Life vs Achieving	17%		1
a. Observed Outcomes (Work Ethic)	50%		1
b. Expressed Values	50%		3
iii. Innovation & Commercialism	17%		9
a. Outputs (e.g., patents, trademarks)	50%		7
b. Inputs (e.g., R&D, # of researchers)	50%		11
iv. Bureaucracy	17%		1
v. Corruption	17%		3
vi. Rule of Law	17%		1
Indebtedness	35%		8
I. Debt and Debt Service Levels	35%		7
II. Debt Flow	15%		10
III. Monetary Policy	50%		14

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 that 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 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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Singapore offers around average value, ranked 8 among the countries we measure. Its workers are somewhat 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 34 hours per week (5 out of 20 countries), and the demographics of the workforce are very unfavorable. Levels of saving and investing are somewhat high given Singapore's very 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, 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 16% 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 about average 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, relative to its income, Singapore has very low bureaucracy and red tape, somewhat low corruption, and very strong rule of law, according to the international measures we are using.

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 slightly better than other countries, ranked 8 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 246% 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 2.8% to 2.9%. 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 Brazil's case, our growth estimate comes from combining our expectation of a 2.2% growth rate per worker, which is roughly in line with the global average, and a labor force growth rate of 0.6% which will boost growth. 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 that 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 somewhat better than most major countries (implying a growth rate of 3.0% on its own), and indebtedness conditions to be worse than other countries (implying a growth rate of 0.8% on its own). As shown below, Brazil'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 monetary policy and its debt and debt service levels. The various gauges and weights are shown below. The individual indicators that are behind them are explained in Part 1 of this study, 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
Projected 10-Year Real Growth Rate :	2.8% to 2.9%		7
Growth in Working-Age Population :	0.6%		5
Projected Real Growth per Worker :	2.2%		10
Component of Growth per Worker Estimate	*Weight*		
Productivity	65%		7
I. Value: What You Pay vs What You Get	70%		6
i. Education	25%		6
ii. Labor Productivity	25%		7
iii. Working Hard	25%		5
a. Avg Hours Worked	67%		5
b. Demographics	33%		3
iv. Investing	25%		4
a. Investment ex-Housing	50%		6
b. Household Savings	50%		-
II. Culture	30%		13
i. Self-Sufficiency	17%		13
a. Work Ethic	50%		12
b. Government Support	25%		14
c. Rigidity of Labor Market	25%		17
ii. Savoring Life vs Achieving	17%		14
a. Observed Outcomes (Work Ethic)	50%		12
b. Expressed Values	50%		19
iii. Innovation & Commercialism	17%		7
a. Outputs (e.g., patents, trademarks)	50%		11
b. Inputs (e.g., R&D, # of researchers)	50%		5
iv. Bureaucracy	17%		20
v. Corruption	17%		10
vi. Rule of Law	17%		13
Indebtedness	35%		17
I. Debt and Debt Service Levels	35%		6
II. Debt Flow	15%		17
III. Monetary Policy	50%		20

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 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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Brazil offers somewhat better than average value, ranked 6 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 somewhat high 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, ranked 13 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 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 39% of GDP), and its labor markets are moderately rigid. 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, relative to its income, Brazil has very high bureaucracy and red tape, average levels of corruption, and average rule of law, according to the international measures we are using.

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 worse than other countries, ranked 17 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 173% 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 tight.

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 1.9% to 2.3%. 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 Korea's case, our growth estimate comes from combining our expectation of a 3.0% growth rate per worker, which is somewhat above the global average, and a labor force growth rate of -0.6% which will weigh on growth. 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 that 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 2.9% 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, 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 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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Korea

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**1.9% to 2.3%**		**8**
Growth in Working-Age Population :	**-0.6%**		**16**
Projected Real Growth per Worker :	**3.0%**		**5**
Component of Growth per Worker Estimate	***Weight***		
Productivity	**65%**		**8**
I. Value: What You Pay vs What You Get	**70%**		**9**
i. Education	**25%**		**8**
ii. Labor Productivity	**25%**		**9**
iii. Working Hard	**25%**		**10**
a. Avg Hours Worked	67%		9
b. Demographics	33%		19
iv. Investing	**25%**		**7**
a. Investment ex-Housing	50%		3
b. Household Savings	50%		9
II. Culture	**30%**		**5**
i. Self-Sufficiency	**17%**		**5**
a. Work Ethic	50%		5
b. Government Support	25%		2
c. Rigidity of Labor Market	25%		12
ii. Savoring Life vs Achieving	**17%**		**8**
a. Observed Outcomes (Work Ethic)	50%		5
b. Expressed Values	50%		9
iii. Innovation & Commercialism	**17%**		**3**
a. Outputs (e.g., patents, trademarks)	50%		3
b. Inputs (e.g., R&D, # of researchers)	50%		1
iv. Bureaucracy	**17%**		**3**
v. Corruption	**17%**		**14**
vi. Rule of Law	**17%**		**11**
Indebtedness	**35%**		**14**
I. Debt and Debt Service Levels	**35%**		**9**
II. Debt Flow	**15%**		**11**
III. Monetary Policy	**50%**		**12**

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 that 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 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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Korea offers around average value, ranked 9 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 30 hours per week (6 out of 20 countries), and the demographics of the workforce are very unfavorable. Levels of saving and investing are roughly average given Korea's high 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, 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 somewhat strong work ethic, its level of government support is low (with government outlays at 21% 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 somewhat strong, and surveys suggest that its people moderately value accomplishment and achievement. Furthermore, innovation and commercialism are somewhat 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 about average. Finally, relative to its income, Korea has somewhat low bureaucracy and red tape, somewhat high corruption, and average rule of law, according to the international measures we are using.

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 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 253% 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.

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 1.6% to 1.7%. This growth rate is roughly at the global average, ranked 9 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 2.7% growth rate per worker, which is somewhat above the global average, and a labor force growth rate of -0.9% which will weigh on growth. 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 that 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 somewhat better than most major countries (implying a growth rate of 3.0% 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, Russia'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 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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Russia

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**1.6% to 1.7%**		**9**
Growth in Working-Age Population :	**-0.9%**		**20**
Projected Real Growth per Worker :	**2.7%**		**7**
Component of Growth per Worker Estimate	***Weight***		
Productivity	**65%**		**6**
I. Value: What You Pay vs What You Get	**70%**		**5**
i. Education	**25%**		**2**
ii. Labor Productivity	**25%**		**2**
iii. Working Hard	**25%**		**7**
a. Avg Hours Worked	67%		8
b. Demographics	33%		8
iv. Investing	**25%**		**8**
a. Investment ex-Housing	50%		15
b. Household Savings	50%		3
II. Culture	**30%**		**15**
i. Self-Sufficiency	**17%**		**7**
a. Work Ethic	50%		11
b. Government Support	25%		7
c. Rigidity of Labor Market	25%		3
ii. Savoring Life vs Achieving	**17%**		**13**
a. Observed Outcomes (Work Ethic)	50%		11
b. Expressed Values	50%		15
iii. Innovation & Commercialism	**17%**		**15**
a. Outputs (e.g., patents, trademarks)	50%		14
b. Inputs (e.g., R&D, # of researchers)	50%		15
iv. Bureaucracy	**17%**		**15**
v. Corruption	**17%**		**17**
vi. Rule of Law	**17%**		**14**
Indebtedness	**35%**		**13**
I. Debt and Debt Service Levels	**35%**		**3**
II. Debt Flow	**15%**		**18**
III. Monetary Policy	**50%**		**15**

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 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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.

Russia offers somewhat better than average value, ranked 5 among the countries we measure. Its workers are somewhat inexpensive, taking into consideration Russia's high levels of education and about average 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 26 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 low 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, 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 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 35% of GDP), and its labor markets are very 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 lightly in research and innovation, and its outputs from innovation, including inventions and earnings, are very low. Finally, relative to its income, Russia has somewhat high bureaucracy and red tape, somewhat high corruption, and average rule of law, according to the international measures we are using.

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.

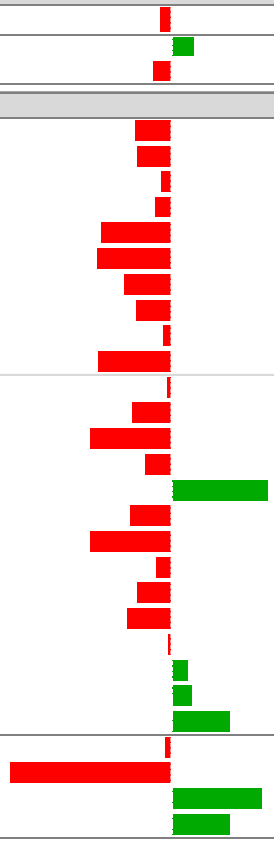
The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Russia's indebtedness position is slightly worse than other countries, ranked 13 out of the 20 countries we look at. The country has a moderate amount of room to lever up in the future, with a total debt burden of around 108% 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.

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 1.6% to 1.7%. This growth rate is roughly at the global average, ranked 10 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 UK's case, our growth estimate comes from combining our expectation of a 1.4% growth rate per worker, which is somewhat below the global average, and a labor force growth rate of 0.2% which will moderately boost growth. 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 that 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 0.8% on its own), and indebtedness conditions to be about average compared to other countries (implying a growth rate of 2.3% 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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: United Kingdom

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**1.6% to 1.7%**		**10**
Growth in Working-Age Population :	**0.2%**		**6**
Projected Real Growth per Worker :	**1.4%**		**14**
Component of Growth per Worker Estimate	*Weight*		
Productivity	65%		15
I. Value: What You Pay vs What You Get	70%		17
i. Education	25%		15
ii. Labor Productivity	25%		16
iii. Working Hard	25%		14
a. Avg Hours Worked	67%		16
b. Demographics	33%		12
iv. Investing	25%		19
a. Investment ex-Housing	50%		16
b. Household Savings	50%		16
II. Culture	30%		11
i. Self-Sufficiency	17%		14
a. Work Ethic	50%		14
b. Government Support	25%		12
c. Rigidity of Labor Market	25%		6
ii. Savoring Life vs Achieving	17%		12
a. Observed Outcomes (Work Ethic)	50%		14
b. Expressed Values	50%		11
iii. Innovation & Commercialism	17%		13
a. Outputs (e.g., patents, trademarks)	50%		9
b. Inputs (e.g., R&D, # of researchers)	50%		14
iv. Bureaucracy	17%		9
v. Corruption	17%		7
vi. Rule of Law	17%		5
Indebtedness	35%		10
I. Debt and Debt Service Levels	35%		20
II. Debt Flow	15%		2
III. Monetary Policy	50%		3



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More Detail

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Productivity

I. Value: What You Pay Versus What You Get

> *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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

UK offers somewhat worse than average value, ranked 17 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 hard relative to the cost of their labor—the average male of working age works 23 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 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, ranked 11 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 about average on this measure, weighing that its workers have a weak work ethic, its level of government support is high (with government outlays at 42% of GDP), and its labor markets are very flexible. UK 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 UK 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, relative to its income, UK has average levels of bureaucracy and red tape, average levels of corruption, and somewhat strong rule of law, according to the international measures we are using.

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 about average compared to other countries, ranked 10 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 435% 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 a bit stimulative.

United States 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 1.6% to 1.9%. This growth rate is roughly at the global average, ranked 11 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 USA'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 0.1% which will moderately boost growth. 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 that 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 somewhat worse than most major countries (implying a growth rate of 1.2% on its own), and indebtedness conditions to be slightly better than other countries (implying a growth rate of 2.9% on its own). As shown below, USA's biggest relative strengths are its monetary policy and its level of self-sufficiency, 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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: United States

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**1.6% to 1.9%**		**11**
Growth in Working-Age Population :	**0.1%**		**7**
Projected Real Growth per Worker :	**1.5%**		**13**
Component of Growth per Worker Estimate	*Weight*		
Productivity	65%		12
I. Value: What You Pay vs What You Get	70%		16
i. Education	25%		14
ii. Labor Productivity	25%		12
iii. Working Hard	25%		15
a. Avg Hours Worked	67%		15
b. Demographics	33%		16
iv. Investing	25%		18
a. Investment ex-Housing	50%		18
b. Household Savings	50%		14
II. Culture	30%		6
i. Self-Sufficiency	17%		8
a. Work Ethic	50%		10
b. Government Support	25%		9
c. Rigidity of Labor Market	25%		2
ii. Savoring Life vs Achieving	17%		6
a. Observed Outcomes (Work Ethic)	50%		10
b. Expressed Values	50%		1
iii. Innovation & Commercialism	17%		4
a. Outputs (e.g., patents, trademarks)	50%		4
b. Inputs (e.g., R&D, # of researchers)	50%		6
iv. Bureaucracy	17%		7
v. Corruption	17%		15
vi. Rule of Law	17%		7
Indebtedness	35%		6
I. Debt and Debt Service Levels	35%		15
II. Debt Flow	15%		7
III. Monetary Policy	50%		2

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 that 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 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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

USA offers somewhat worse than average value, ranked 16 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 (12 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are somewhat low given USA's very 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 neutral for growth in coming years, 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 37% 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 about average. Finally, relative to its income, USA has somewhat low bureaucracy and red tape, somewhat high corruption, and somewhat strong rule of law, according to the international measures we are using.

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 327% 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.

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 1.5% to 1.6%. 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 0.8% growth rate per worker, which is well below the global average, and a labor force growth rate of 0.7% which will boost growth. 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 that 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 1.1% on its own), and indebtedness conditions to be worse than other countries (implying a growth rate of 0.5% on its own). As shown below, Australia's biggest relative strengths are its level of bureaucracy and its rule of law, 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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Australia

		-4 ← Score (Standard Deviation) → +4	Rank
Projected 10-Year Real Growth Rate :	**1.5% to 1.6%**		**12**
Growth in Working-Age Population :	**0.7%**		**4**
Projected Real Growth per Worker :	**0.8%**		**17**
Component of Growth per Worker Estimate	*Weight*		
Productivity	**65%**		**14**
I. Value: What You Pay vs What You Get	**70%**		**14**
i. Education	**25%**		**16**
ii. Labor Productivity	**25%**		**19**
iii. Working Hard	**25%**		**13**
a. Avg Hours Worked	67%		11
b. Demographics	33%		15
iv. Investing	**25%**		**13**
a. Investment ex-Housing	50%		10
b. Household Savings	50%		10
II. Culture	**30%**		**8**
i. Self-Sufficiency	**17%**		**12**
a. Work Ethic	50%		9
b. Government Support	25%		10
c. Rigidity of Labor Market	25%		16
ii. Savoring Life vs Achieving	**17%**		**7**
a. Observed Outcomes (Work Ethic)	50%		9
b. Expressed Values	50%		5
iii. Innovation & Commercialism	**17%**		**10**
a. Outputs (e.g., patents, trademarks)	50%		13
b. Inputs (e.g., R&D, # of researchers)	50%		9
iv. Bureaucracy	**17%**		**4**
v. Corruption	**17%**		**9**
vi. Rule of Law	**17%**		**8**
Indebtedness	**35%**		**19**
I. Debt and Debt Service Levels	**35%**		**13**
II. Debt Flow	**15%**		**15**
III. Monetary Policy	**50%**		**16**

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 that 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 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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Australia offers somewhat worse than average value, ranked 14 among the countries we measure. Its workers are somewhat 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, ranked 8 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 moderately rigid. 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 moderately value accomplishment and achievement. Furthermore, innovation and commercialism are about average in Australia 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, relative to its income, Australia has somewhat low bureaucracy and red tape, average levels of corruption, and somewhat strong rule of law, according to the international measures we are using.

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 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 355% 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.

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 1.4%. This growth rate is somewhat below the global average, ranked 13 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 2.2% growth rate per worker, which is roughly in line with the global average, and a labor force growth rate of -0.8% which will weigh on growth. 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 that 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 better than other countries (implying a growth rate of 3.3% on its own). As shown below, Hungary's biggest relative strengths are its monetary policy and the value its workers provide relative to education levels, 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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Hungary

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**1.4%**		**13**
Growth in Working-Age Population :	**-0.8%**		**19**
Projected Real Growth per Worker :	**2.2%**		**9**
Component of Growth per Worker Estimate	***Weight***		
Productivity	**65%**		**10**
I. Value: What You Pay vs What You Get	**70%**		**10**
i. Education	**25%**		**7**
ii. Labor Productivity	**25%**		**6**
iii. Working Hard	**25%**		**11**
a. Avg Hours Worked	67%		12
b. Demographics	33%		7
iv. Investing	**25%**		**9**
a. Investment ex-Housing	50%		9
b. Household Savings	50%		6
II. Culture	**30%**		**16**
i. Self-Sufficiency	**17%**		**15**
a. Work Ethic	50%		15
b. Government Support	25%		17
c. Rigidity of Labor Market	25%		8
ii. Savoring Life vs Achieving	**17%**		**17**
a. Observed Outcomes (Work Ethic)	50%		15
b. Expressed Values	50%		14
iii. Innovation & Commercialism	**17%**		**14**
a. Outputs (e.g., patents, trademarks)	50%		16
b. Inputs (e.g., R&D, # of researchers)	50%		12
iv. Bureaucracy	**17%**		**11**
v. Corruption	**17%**		**11**
vi. Rule of Law	**17%**		**16**
Indebtedness	**35%**		**4**
I. Debt and Debt Service Levels	**35%**		**11**
II. Debt Flow	**15%**		**5**
III. Monetary Policy	**50%**		**1**

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 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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Hungary offers around average value, ranked 10 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 20 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, ranked 16 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 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 very low. Finally, relative to its income, Hungary has average levels of bureaucracy and red tape, average levels of corruption, and somewhat weak rule of law, according to the international measures we are using.

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 better than other countries, ranked 4 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 216% 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 simulative.

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 0.4% to 1.0%. This growth rate is somewhat below the global average, ranked 14 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 France's case, our growth estimate comes from combining our expectation of a 1.0% growth rate per worker, which is somewhat below the global average, and a labor force growth rate of 0.0% which will modestly impact growth. 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 that 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 -0.5% on its own), and indebtedness conditions to be about average compared to other countries (implying a growth rate of 2.0% 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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: France

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**0.4% to 1.0%**		**14**
Growth in Working-Age Population :	**0.0%**		**10**
Projected Real Growth per Worker :	**1.0%**		**16**
Component of Growth per Worker Estimate	***Weight***		
Productivity	**65%**		**18**
I. Value: What You Pay vs What You Get	**70%**		**19**
i. Education	**25%**		**20**
ii. Labor Productivity	**25%**		**20**
iii. Working Hard	**25%**		**19**
a. Avg Hours Worked	67%		20
b. Demographics	33%		14
iv. Investing	**25%**		**11**
a. Investment ex-Housing	50%		11
b. Household Savings	50%		7
II. Culture	**30%**		**17**
i. Self-Sufficiency	**17%**		**20**
a. Work Ethic	50%		20
b. Government Support	25%		20
c. Rigidity of Labor Market	25%		19
ii. Savoring Life vs Achieving	**17%**		**20**
a. Observed Outcomes (Work Ethic)	50%		20
b. Expressed Values	50%		17
iii. Innovation & Commercialism	**17%**		**16**
a. Outputs (e.g., patents, trademarks)	50%		17
b. Inputs (e.g., R&D, # of researchers)	50%		17
iv. Bureaucracy	**17%**		**13**
v. Corruption	**17%**		**12**
vi. Rule of Law	**17%**		**12**
Indebtedness	**35%**		**12**
I. Debt and Debt Service Levels	**35%**		**17**
II. Debt Flow	**15%**		**6**
III. Monetary Policy	**50%**		**6**

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 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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

France offers somewhat worse than average value, ranked 19 among the countries we measure. Its workers are somewhat 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, ranked 17 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 very rigid. 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 lightly in research and innovation, and its outputs from innovation, including inventions and earnings, are very low. Finally, relative to its income, France has average levels of bureaucracy and red tape, average levels of corruption, and average rule of law, according to the international measures we are using.

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 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 323% 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.

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 0.3% to 0.8%. This growth rate is somewhat below the global average, ranked 15 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 1.6% growth rate per worker, which is roughly in line with the global average, and a labor force growth rate of -0.8% which will weigh on growth. 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 that 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 0.2% on its own), and indebtedness conditions to be slightly better than other countries (implying a growth rate of 2.6% 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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Germany

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**0.3% to 0.8%**		15
Growth in Working-Age Population :	**-0.8%**		18
Projected Real Growth per Worker :	**1.6%**		11
Component of Growth per Worker Estimate	*Weight*		
Productivity	65%		16
I. Value: What You Pay vs What You Get	70%		20
i. Education	25%		18
ii. Labor Productivity	25%		17
iii. Working Hard	25%		20
a. Avg Hours Worked	67%		19
b. Demographics	33%		17
iv. Investing	25%		17
a. Investment ex-Housing	50%		20
b. Household Savings	50%		8
II. Culture	30%		12
i. Self-Sufficiency	17%		16
a. Work Ethic	50%		17
b. Government Support	25%		15
c. Rigidity of Labor Market	25%		13
ii. Savoring Life vs Achieving	17%		15
a. Observed Outcomes (Work Ethic)	50%		17
b. Expressed Values	50%		7
iii. Innovation & Commercialism	17%		11
a. Outputs (e.g., patents, trademarks)	50%		10
b. Inputs (e.g., R&D, # of researchers)	50%		10
iv. Bureaucracy	17%		10
v. Corruption	17%		5
vi. Rule of Law	17%		9
Indebtedness	35%		7
I. Debt and Debt Service Levels	35%		14
II. Debt Flow	15%		4
III. Monetary Policy	50%		5

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 that 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 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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Germany offers somewhat worse than average value, ranked 20 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, 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 44% of GDP), and its labor markets are neither rigid nor flexible. Germany also seems to value savoring much 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 about average in Germany 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, relative to its income, Germany has average levels of bureaucracy and red tape, somewhat low corruption, and somewhat strong rule of law, according to the international measures we are using.

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.*

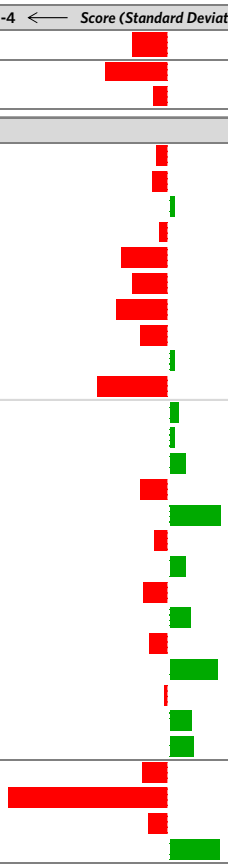
The other major piece of our economic health index looks at the likelihood of debt being a support or detriment to future growth. Germany's indebtedness position is slightly better than other countries, ranked 7 out of the 20 countries we look at. The country has very little room to lever up in the future, with a total debt burden of around 246% 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.

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 0.8% to 0.9%. This growth rate is somewhat below the global average, ranked 16 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 Japan'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 -0.7% which will weigh on growth. 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 that 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 about average compared to 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 1.6% 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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Japan

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**0.8% to 0.9%**		16
Growth in Working-Age Population :	**-0.7%**		17
Projected Real Growth per Worker :	**1.5%**		12
Component of Growth per Worker Estimate	***Weight***		
Productivity	**65%**		11
I. Value: What You Pay vs What You Get	**70%**		11
i. Education	**25%**		12
ii. Labor Productivity	**25%**		14
iii. Working Hard	**25%**		9
a. Avg Hours Worked	67%		10
b. Demographics	33%		13
iv. Investing	**25%**		16
a. Investment ex-Housing	50%		12
b. Household Savings	50%		15
II. Culture	**30%**		7
i. Self-Sufficiency	**17%**		9
a. Work Ethic	50%		6
b. Government Support	25%		13
c. Rigidity of Labor Market	25%		11
ii. Savoring Life vs Achieving	**17%**		9
a. Observed Outcomes (Work Ethic)	50%		6
b. Expressed Values	50%		12
iii. Innovation & Commercialism	**17%**		6
a. Outputs (e.g., patents, trademarks)	50%		5
b. Inputs (e.g., R&D, # of researchers)	50%		7
iv. Bureaucracy	**17%**		12
v. Corruption	**17%**		6
vi. Rule of Law	**17%**		10
Indebtedness	**35%**		15
I. Debt and Debt Service Levels	**35%**		19
II. Debt Flow	**15%**		14
III. Monetary Policy	**50%**		4



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 that 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 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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Japan offers around average value, ranked 11 among the countries we measure. Its workers are neither expensive nor inexpensive, 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 29 hours per week (8 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, ranked 7 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 roughly average work ethic, its level of government support is high (with government outlays at 40% of GDP), and its labor markets are moderately flexible. Japan 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 don't especially value accomplishment and achievement. Furthermore, innovation and commercialism are about average in Japan 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, relative to its income, Japan has average levels of bureaucracy and red tape, somewhat low corruption, and somewhat strong rule of law, according to the international measures we are using.

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 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 395% 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 stimulative.

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 0.8% to 1.0%. This growth rate is well 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 Canada's case, our growth estimate comes from combining our expectation of a 0.7% growth rate per worker, which is well below the global average, and a labor force growth rate of 0.1% which will modestly impact growth. 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 that 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 1.2% 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, Canada's biggest relative strengths are its rule of law and its level of bureaucracy, 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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Canada

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**0.8% to 1.0%**		**17**
Growth in Working-Age Population :	**0.1%**		**9**
Projected Real Growth per Worker :	**0.7%**		**18**
Component of Growth per Worker Estimate	***Weight***		
Productivity	**65%**		**13**
I. Value: What You Pay vs What You Get	**70%**		**13**
i. Education	**25%**		**13**
ii. Labor Productivity	**25%**		**15**
iii. Working Hard	**25%**		**16**
a. Avg Hours Worked	67%		**13**
b. Demographics	33%		**18**
iv. Investing	**25%**		**15**
a. Investment ex-Housing	50%		**13**
b. Household Savings	50%		**13**
II. Culture	**30%**		**9**
i. Self-Sufficiency	**17%**		**11**
a. Work Ethic	50%		**13**
b. Government Support	25%		**11**
c. Rigidity of Labor Market	25%		**7**
ii. Savoring Life vs Achieving	**17%**		**11**
a. Observed Outcomes (Work Ethic)	50%		**13**
b. Expressed Values	50%		**10**
iii. Innovation & Commercialism	**17%**		**12**
a. Outputs (e.g., patents, trademarks)	50%		**12**
b. Inputs (e.g., R&D, # of researchers)	50%		**13**
iv. Bureaucracy	**17%**		**5**
v. Corruption	**17%**		**8**
vi. Rule of Law	**17%**		**6**
Indebtedness	**35%**		**18**
I. Debt and Debt Service Levels	**35%**		**10**
II. Debt Flow	**15%**		**16**
III. Monetary Policy	**50%**		**17**

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 that 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 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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Canada offers somewhat worse than average value, ranked 13 among the countries we measure. Its workers are neither expensive nor inexpensive, 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, ranked 9 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 40% 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 about average 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, relative to its income, Canada has somewhat low bureaucracy and red tape, average levels of corruption, and somewhat strong rule of law, according to the international measures we are using.

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 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 319% 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.

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 0.2% to 0.7%. 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 Spain's case, our growth estimate comes from combining our expectation of a 1.0% growth rate per worker, which is somewhat below the global average, and a labor force growth rate of -0.3% which will moderately weigh on growth. 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 that 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 -0.3% 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, Spain's biggest relative strengths are its low reliance on credit flows for growth and its monetary policy, 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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Spain

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**0.2% to 0.7%**		**18**
Growth in Working-Age Population :	**-0.3%**		**12**
Projected Real Growth per Worker :	**1.0%**		**15**
Component of Growth per Worker Estimate	***Weight***		
Productivity	**65%**		**17**
I. Value: What You Pay vs What You Get	**70%**		**15**
i. Education	**25%**		**17**
ii. Labor Productivity	**25%**		**13**
iii. Working Hard	**25%**		**17**
a. Avg Hours Worked	67%		**18**
b. Demographics	33%		**10**
iv. Investing	**25%**		**10**
a. Investment ex-Housing	50%		**8**
b. Household Savings	50%		**11**
II. Culture	**30%**		**18**
i. Self-Sufficiency	**17%**		**18**
a. Work Ethic	50%		**18**
b. Government Support	25%		**16**
c. Rigidity of Labor Market	25%		**15**
ii. Savoring Life vs Achieving	**17%**		**16**
a. Observed Outcomes (Work Ethic)	50%		**18**
b. Expressed Values	50%		**8**
iii. Innovation & Commercialism	**17%**		**18**
a. Outputs (e.g., patents, trademarks)	50%		**18**
b. Inputs (e.g., R&D, # of researchers)	50%		**16**
iv. Bureaucracy	**17%**		**18**
v. Corruption	**17%**		**16**
vi. Rule of Law	**17%**		**17**
Indebtedness	**35%**		**11**
I. Debt and Debt Service Levels	**35%**		**16**
II. Debt Flow	**15%**		**1**
III. Monetary Policy	**50%**		**9**

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 that 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 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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Spain offers somewhat worse than average value, ranked 15 among the countries we measure. Its workers are neither expensive nor inexpensive, 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 19 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, 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 very 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 neither rigid nor flexible. Spain also seems to value savoring much 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 Spain 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, relative to its income, Spain has somewhat high bureaucracy and red tape, somewhat high corruption, and somewhat weak rule of law, according to the international measures we are using.

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 about average compared to other countries, ranked 11 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 329% 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 a bit 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 -0.6% to -0.2%. 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 0.2% growth rate per worker, which is well below the global average, and a labor force growth rate of -0.5% which will moderately weigh on growth. 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 that 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 -1.5% 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, Italy'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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Italy

		-4 ← Score (Standard Deviation) → +4	Rank
Projected 10-Year Real Growth Rate :	**-0.6% to -0.2%**		**19**
Growth in Working-Age Population :	**-0.5%**		**15**
Projected Real Growth per Worker :	**0.2%**		**19**
Component of Growth per Worker Estimate	*Weight*		
Productivity	65%		20
I. Value: What You Pay vs What You Get	70%		18
i. Education	25%		19
ii. Labor Productivity	25%		18
iii. Working Hard	25%		18
a. Avg Hours Worked	67%		17
b. Demographics	33%		11
iv. Investing	25%		14
a. Investment ex-Housing	50%		14
b. Household Savings	50%		12
II. Culture	30%		20
i. Self-Sufficiency	17%		19
a. Work Ethic	50%		19
b. Government Support	25%		18
c. Rigidity of Labor Market	25%		20
ii. Savoring Life vs Achieving	17%		19
a. Observed Outcomes (Work Ethic)	50%		19
b. Expressed Values	50%		18
iii. Innovation & Commercialism	17%		20
a. Outputs (e.g., patents, trademarks)	50%		19
b. Inputs (e.g., R&D, # of researchers)	50%		20
iv. Bureaucracy	17%		19
v. Corruption	17%		20
vi. Rule of Law	17%		20
Indebtedness	35%		9
I. Debt and Debt Service Levels	35%		12
II. Debt Flow	15%		3
III. Monetary Policy	50%		8

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 that 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 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 who 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 19 hours per week (17 out of 20 countries), and the demographics of the workforce are unfavorable. Levels of saving and investing are somewhat low 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, 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, relative to its income, Italy has very high bureaucracy and red tape, very high corruption, and very weak rule of law, according to the international measures we are using.

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 about average compared to other countries, ranked 9 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 308% 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.

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 -1.0% to -0.9%. 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 -0.6% growth rate per worker, which is well below the global average, and a labor force growth rate of -0.4% which will moderately weigh on growth. 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 that 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 much worse than most major countries (implying a growth rate of -0.6% on its own), and indebtedness conditions to be worse than other countries (implying a growth rate of -0.2% on its own). As shown below, Greece's biggest relative strengths are the value its workers provide relative to education levels and its 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 study, and listed in the appendix of this section. Please review this table to understand our comments.

Economic Health Index: Greece

		-4 ⟵ Score (Standard Deviation) ⟶ +4	Rank
Projected 10-Year Real Growth Rate :	**-1.0% to -0.9%**		**20**
Growth in Working-Age Population :	**-0.4%**		**13**
Projected Real Growth per Worker :	**-0.6%**		**20**
Component of Growth per Worker Estimate	***Weight***		
Productivity	**65%**		**19**
I. Value: What You Pay vs What You Get	**70%**		**12**
i. Education	**25%**		**11**
ii. Labor Productivity	**25%**		**10**
iii. Working Hard	**25%**		**12**
a. Avg Hours Worked	67%		**14**
b. Demographics	33%		**9**
iv. Investing	**25%**		**20**
a. Investment ex-Housing	50%		**19**
b. Household Savings	50%		**17**
II. Culture	**30%**		**19**
i. Self-Sufficiency	**17%**		**17**
a. Work Ethic	50%		**16**
b. Government Support	25%		**19**
c. Rigidity of Labor Market	25%		**14**
ii. Savoring Life vs Achieving	**17%**		**18**
a. Observed Outcomes (Work Ethic)	50%		**16**
b. Expressed Values	50%		**-**
iii. Innovation & Commercialism	**17%**		**19**
a. Outputs (e.g., patents, trademarks)	50%		**20**
b. Inputs (e.g., R&D, # of researchers)	50%		**19**
iv. Bureaucracy	**17%**		**17**
v. Corruption	**17%**		**19**
vi. Rule of Law	**17%**		**19**
Indebtedness	**35%**		**20**
I. Debt and Debt Service Levels	**35%**		**18**
II. Debt Flow	**15%**		**13**
III. Monetary Policy	**50%**		**18**

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 that 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 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 who are relatively inexpensive and that have higher investment rates grow faster than those that don't.*

Greece offers somewhat worse than average value, ranked 12 among the countries we measure. Its workers are somewhat 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 21 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 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, 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 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 52% of GDP), and its labor markets are neither rigid nor 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, relative to its income, Greece has somewhat high bureaucracy and red tape, very high corruption, and very weak rule of law, according to the international measures we are using.

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 312% 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 A

Below you'll find more detailed descriptions of the pieces we used to construct our productivity gauge. We suggest skimming this section, perhaps tracking how a particular country does through the different metrics.

Table of Contents

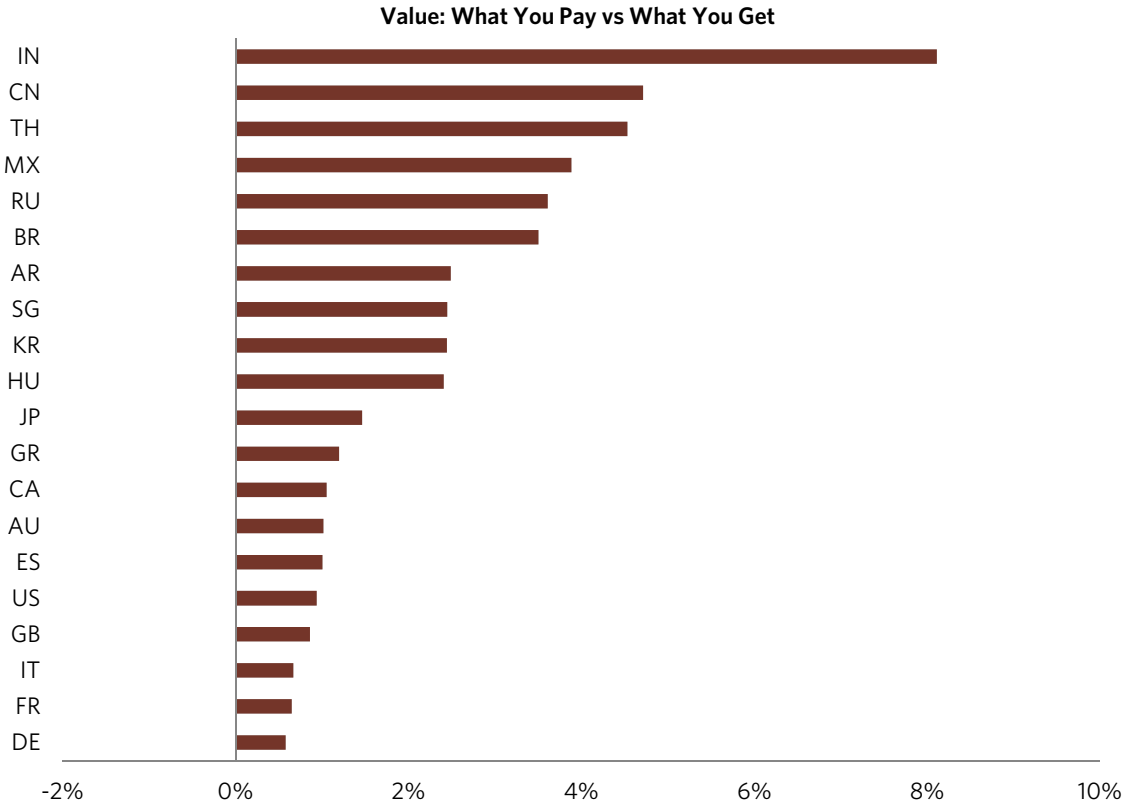
Value: What You Pay Versus What You Get

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 according to 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 67% 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**
Aggregate	**67%**	**45%**
Cost of a Quality-Adjusted Educated Worker	66%	11.3%
Cost of a Productivity-Adjusted Educated Worker	57%	11.3%
Working Hard Relative to Income (2 pieces)	64%	11.3%
Avg. Hours Worked Rel. Inc.	63%	7.5%
Demographics Rel. Inc.	50%	3.8%
Investing Relative to Income (2 pieces)	58%	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. Japan scores at 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.



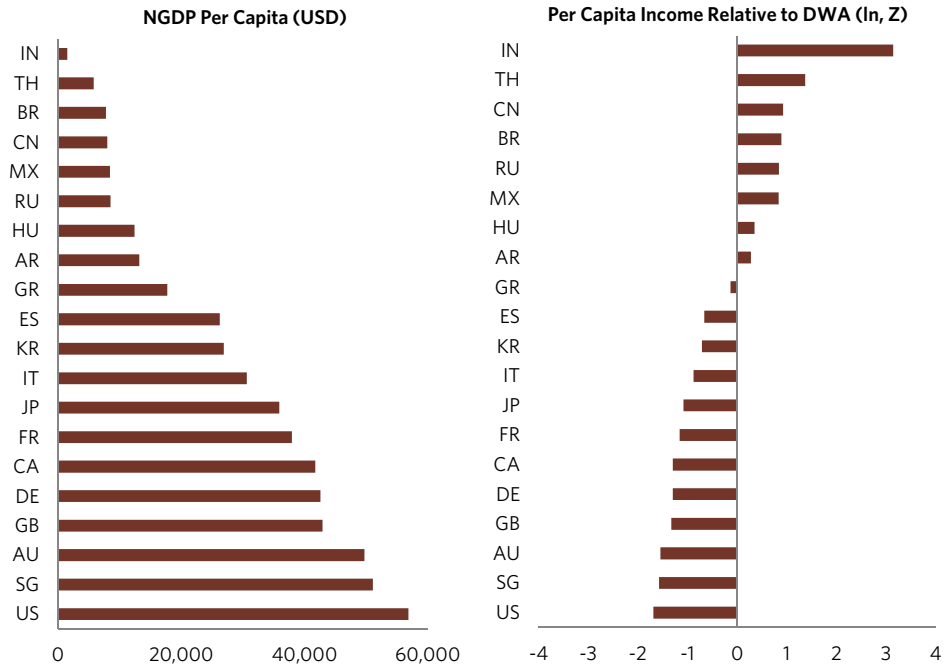
Next, we look at the components of our "value: what you pay versus what you get" indicator.

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. 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 $1,500, which is much lower than that of many of the major developing world countries like China, Mexico, Brazil, Russia, or Thailand. Even with its significant increase in cost in recent years, China's cost is still one of the lowest in the world, with per capita income of about $8,000, modestly below 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 with people that are inexpensive. While developed world countries in general have high incomes, it's worth noting some differentiation between those countries—for example, GDP per capita in the poorest European countries like Spain and Italy is quite a bit lower than 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 and uneducated workers (e.g., 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.[383] 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 drug researchers 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 education levels and a country's future growth rate.

We show our aggregate measure below on the right, next to our measure of education quality[384] on its own for perspective. Overall, India looks to have the most attractively priced educated population, followed by Russia, with China and Mexico not far behind. Looking across education levels, workers in India with similar levels of education cost a fraction of what their peers in the US cost (around 1/20th). 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 1/10th 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, though they have slipped slightly below Russia on a cost basis in the last few years. Within the developed world, the US looks to have some of 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, even accounting for its good quality of education.

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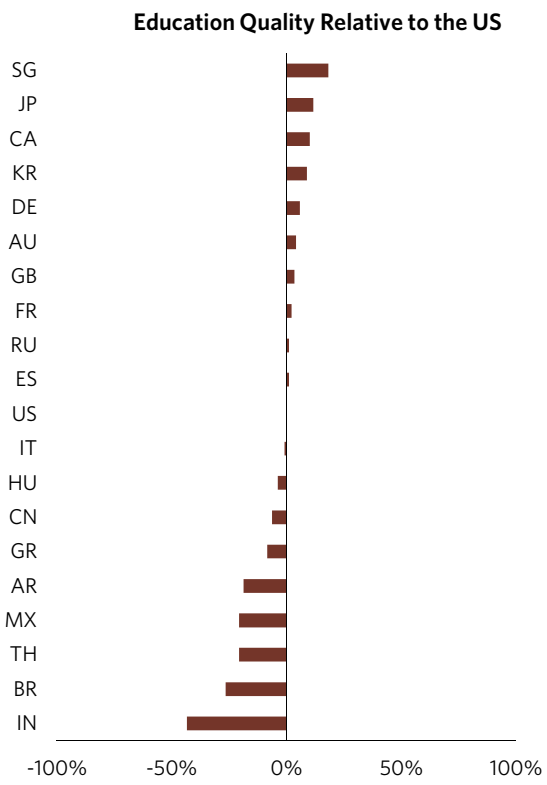
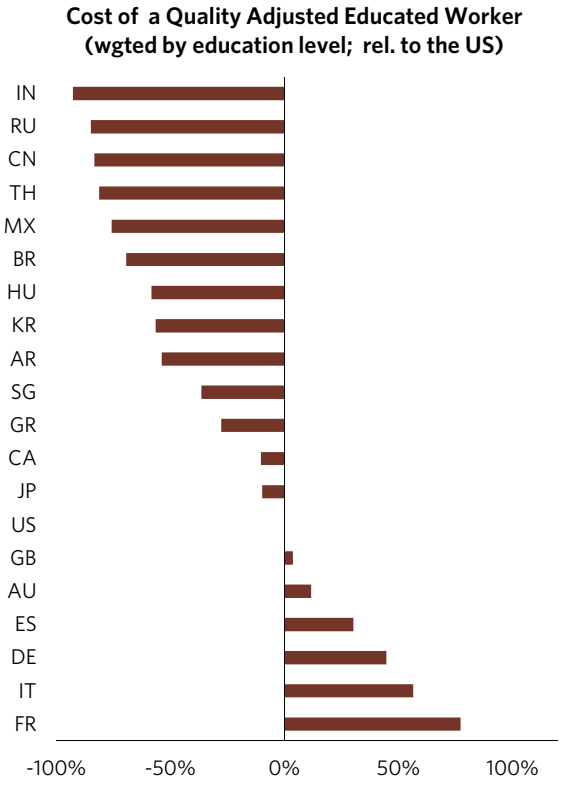
[383] Our measure of education quality is based on the education quality measures of the OECD's Program for International Student Assessment (PISA). PISA's assessments are designed to test the ability to apply knowledge rather than mastery of a specific curriculum. Our aggregate measure takes into account 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. Seventy-two countries participated in the most recent PISA section in 2015. 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.

[384] 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.





Cost of a Quality-Adjusted Educated Worker

Country	IN	RU	CN	TH	MX	BR	HU	KR	AR	SG	GR	CA	JP	US	GB	AU	ES	DE	IT	FR
Cost of a Quality-Adjusted Educated Worker rel. to the US	-93%	-85%	-83%	-81%	-76%	-69%	-58%	-57%	-54%	-36%	-28%	-10%	-10%	0%	4%	12%	30%	45%	56%	77%
Education Quality Relative to the US	-43%	1%	-6%	-21%	-21%	-26%	-4%	9%	-19%	18%	-8%	10%	12%	0%	4%	4%	1%	6%	-1%	2%
% of Working-Age Pop Attained at least Primary School	65%	97%	86%	75%	80%	80%	100%	96%	92%	82%	94%	97%	97%	99%	97%	97%	89%	97%	93%	97%
% of Working-Age Pop Attained at Least Secondary School	34%	83%	55%	32%	36%	36%	70%	77%	42%	68%	54%	76%	72%	90%	73%	69%	44%	76%	46%	61%
% of Working-Age Pop Attained at Least Tertiary School	5%	25%	3%	10%	10%	6%	15%	30%	3%	30%	23%	23%	19%	27%	15%	19%	15%	13%	7%	11%
NGDP Per Capita rel. to US	3%	15%	14%	11%	14%	15%	22%	48%	21%	90%	31%	75%	68%	100%	73%	89%	47%	76%	54%	67%

Cohort Level Costs

Country	IN	RU	CN	TH	MX	BR	HU	KR	AR	SG	GR	CA	JP	US	GB	AU	ES	DE	IT	FR
Cost of Tertiary Educated Worker rel. to the US, Adj. for Ed. Quality	-96%	-86%	-87%	-90%	-80%	-67%	-74%	-71%	-69%	-51%	-61%	-37%	-53%	0%	-18%	-23%	-38%	-16%	-21%	1%
Cost of Secondary Educated Worker rel. to the US, Adj. for Ed. Quality	-94%	-86%	-84%	-84%	-77%	-66%	-63%	-59%	-54%	-45%	-39%	-15%	-25%	0%	-2%	10%	1%	35%	29%	56%
Cost of Primary Educated Worker rel. to the US, Adj. for Ed. Quality	-88%	-80%	-79%	-74%	-68%	-60%	-41%	-33%	-47%	-5%	2%	26%	46%	0%	32%	41%	77%	107%	98%	131%
Cost of Literate, Uneducated Worker rel. to the US	-93%	-80%	-87%	-85%	-84%	-85%	-51%	-37%	-82%	-9%	-40%	16%	67%	0%	0%	-9%	12%	93%	3%	53%
Cost of Illiterate, Uneducated Worker rel. to the US	-94%	-79%	-91%	-89%	-89%	-93%	-47%	-38%	-86%	-38%	-44%	12%	78%	0%	-5%	-18%	-8%	101%	-8%	57%

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 and Russia's workers cost a fraction relative to the US, and India's workers are 2/3 the cost of Russia'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 (Indexed to US, by Education Level)

Country	Wt Avg	Tertiary	Secondary	Primary	Literate	Illiterate
IN	-93%	-96%	-94%	-88%	-93%	-94%
RU	-85%	-86%	-86%	-80%	-80%	-79%
CN	-83%	-87%	-84%	-79%	-87%	-91%
TH	-81%	-90%	-84%	-74%	-85%	-89%
MX	-76%	-80%	-77%	-68%	-84%	-89%
BR	-69%	-67%	-66%	-60%	-85%	-93%
HU	-58%	-74%	-63%	-41%	-51%	-47%
KR	-57%	-71%	-59%	-33%	-37%	-38%
AR	-54%	-69%	-54%	-47%	-82%	-86%
SG	-36%	-51%	-45%	-5%	-9%	-38%
GR	-28%	-61%	-39%	2%	-40%	-44%
CA	-10%	-37%	-15%	26%	16%	12%
JP	-10%	-53%	-25%	46%	67%	78%
US	0%	0%	0%	0%	0%	0%
GB	4%	-18%	-2%	32%	0%	-5%
AU	12%	-23%	10%	41%	-9%	-18%
ES	30%	-38%	1%	77%	12%	-8%
DE	45%	-16%	35%	107%	93%	101%
IT	56%	-21%	29%	98%	3%	-8%
FR	77%	1%	56%	131%	53%	57%
Dev. World	41%	-16%	22%	94%	58%	54%
EM. World	-68%	-75%	-70%	-57%	-68%	-72%

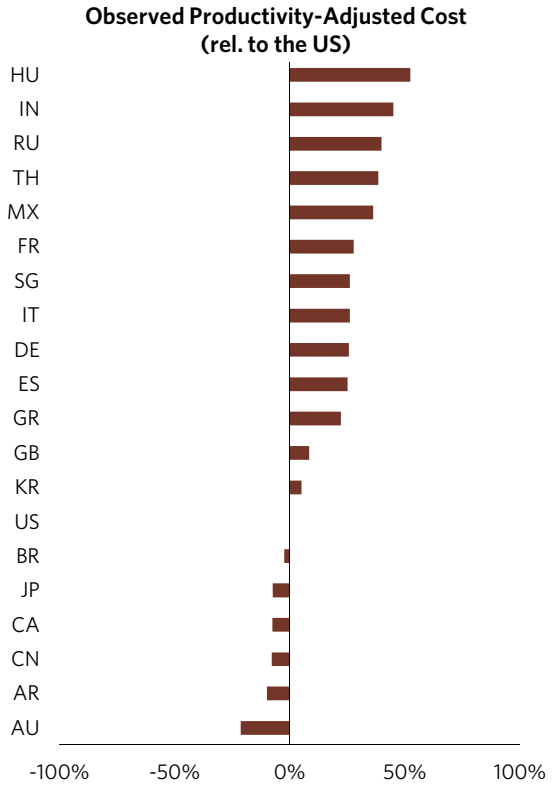
1/25 the US

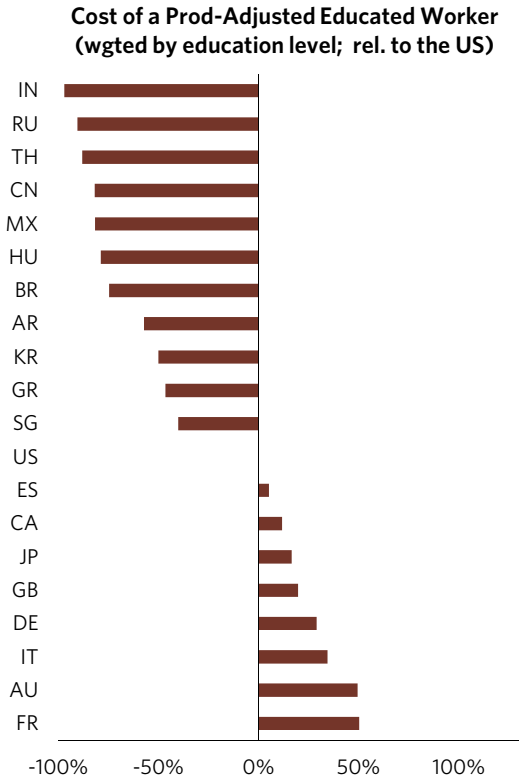
Less educated workers in the US appear much lower cost than in the rest of the developed world (though less so than in the past). European labor looks especially expensive at these levels.

Cost of labor in the emerging world is less than half the cost of the developed world, 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 measures—about 57%. 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	RU	TH	CN	MX	HU	BR	AR	KR	GR	SG	US	ES	CA	JP	GB	DE	IT	AU	FR
Cost of a Productivity-Adjusted Educated Worker rel. to the US	-97%	-90%	-88%	-82%	-82%	-79%	-75%	-57%	-50%	-47%	-40%	0%	5%	12%	17%	20%	29%	34%	49%	50%
Observed Productivity-Adjusted Cost rel. to the US	45%	40%	39%	-8%	36%	52%	-2%	-10%	5%	22%	26%	0%	25%	-7%	-7%	9%	26%	26%	-21%	28%
Cost of Tertiary Educated Worker rel. to the US	-98%	-86%	-92%	-88%	-84%	-75%	-76%	-74%	-68%	-64%	-42%	0%	-37%	-31%	-48%	-15%	-11%	-22%	-20%	3%
Cost of Secondary Educated Worker rel. to the US	-97%	-86%	-87%	-85%	-82%	-65%	-75%	-62%	-55%	-44%	-35%	0%	2%	-6%	-16%	2%	42%	28%	14%	60%
Cost of Primary Educated Worker rel. to the US	-93%	-79%	-80%	-80%	-75%	-43%	-71%	-57%	-26%	-6%	12%	0%	79%	39%	63%	36%	119%	96%	47%	136%
Cost of Literate, Uneducated Worker rel. to the US	-93%	-80%	-85%	-87%	-84%	-51%	-85%	-82%	-37%	-40%	-9%	0%	12%	16%	67%	0%	93%	3%	-9%	53%
Cost of Illiterate, Uneducated Worker rel. to the US	-94%	-79%	-89%	-91%	-89%	-47%	-93%	-86%	-38%	-44%	-38%	0%	-8%	12%	78%	-5%	101%	-8%	-18%	57%

Working Hard

Just like hardworking individuals, hardworking countries will generally be more productive and find ways to improve faster than those that are less hardworking. 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 hardworking society that is low-cost to be more competitive and grow faster than a country with a population that prefers leisure and is expensive.

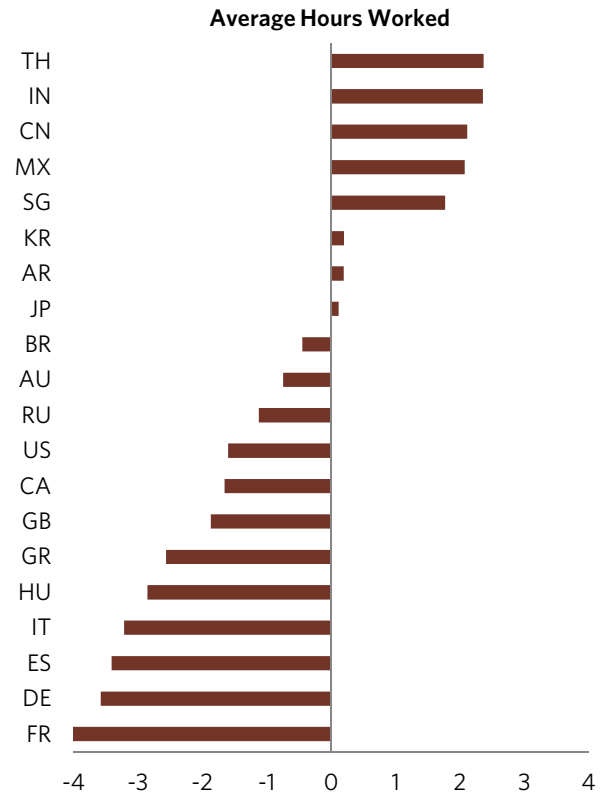
To construct a simple measure of working hard, we look at two pieces: 1) average weekly hours of actual work by men in the labor force, adjusting for things like vacation time and holidays, and 2) shifts in the amount of the population as a whole that is working. While the number of hours worked is just 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. This gauge, when income-weighted, has a 64% correlation with subsequent 10-year growth.

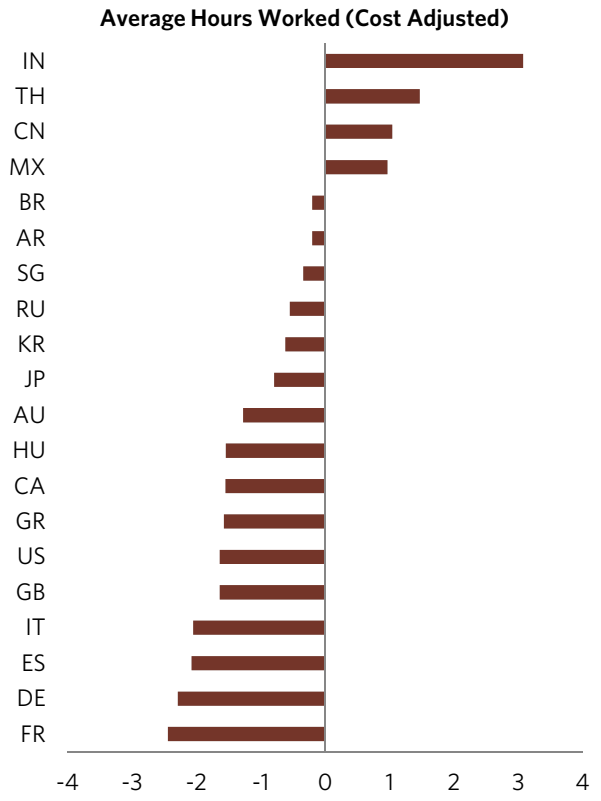
We look at our aggregate measure below first, followed by components. Emerging Asian workers are generally the hardest workers in the world, including China, India, and Thailand. Mexico also stands out as particularly hardworking. Among the richer countries, Singapore is by far the hardest working (competitive with much poorer countries), and Japanese workers are some of the most hardworking of developed countries, followed by the English-speaking developed countries. Continental European workers are generally the least hardworking 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.

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 toward 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.





Avg. Hours Worked

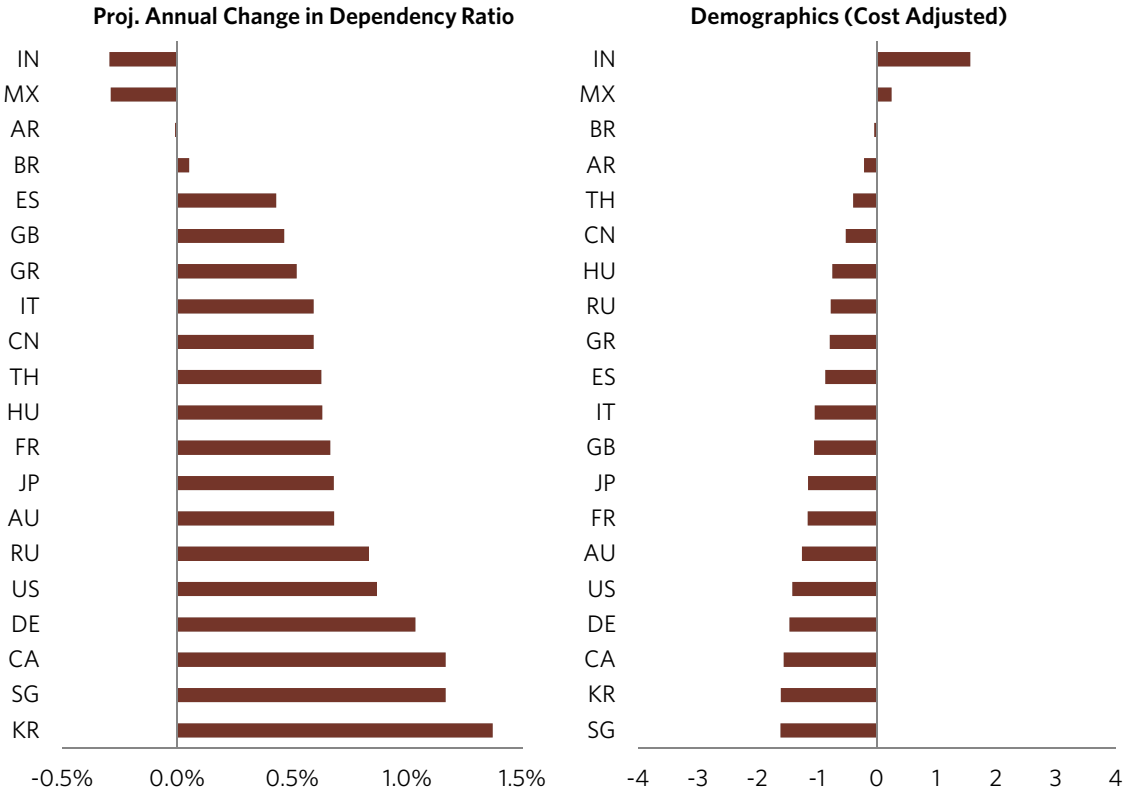
Country	TH	IN	CN	MX	SG	KR	AR	JP	BR	AU	RU	US	CA	GB	GR	HU	IT	ES	DE	FR
Avg. Actual Hours Worked per Working-Aged Male	36	36	35	35	34	30	30	29	28	27	26	24	24	23	21	20	19	19	18	17
Male Reported Avg. Hours Worked (ex-Vacation)	45	47	47	46	46	43	43	44	38	39	38	37	36	37	41	37	36	35	29	30
Male Labor Force Participation	81%	80%	78%	80%	77%	72%	75%	70%	81%	72%	72%	69%	71%	69%	63%	60%	60%	66%	66%	61%
Unemployment Rate (10yr Avg.)	1%	4%	4%	5%	2%	3%	8%	4%	9%	5%	6%	7%	7%	7%	17%	9%	9%	18%	7%	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 hardest working and most 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 countries in the world today—and particularly developed countries—are likely to see a drag on their future growth in income per worker from these demographic shifts, due to aging populations. This impact is particularly acute for Canada but significant for the US, Europe, the UK, and Japan as well. The picture is more mixed in the emerging world. Demographic pressures are a support in India and Mexico 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 and Mexico are the two countries that stand out as having a positive pressure after adjusting for cost; the pressure looks more muted in most of the rest, including China.

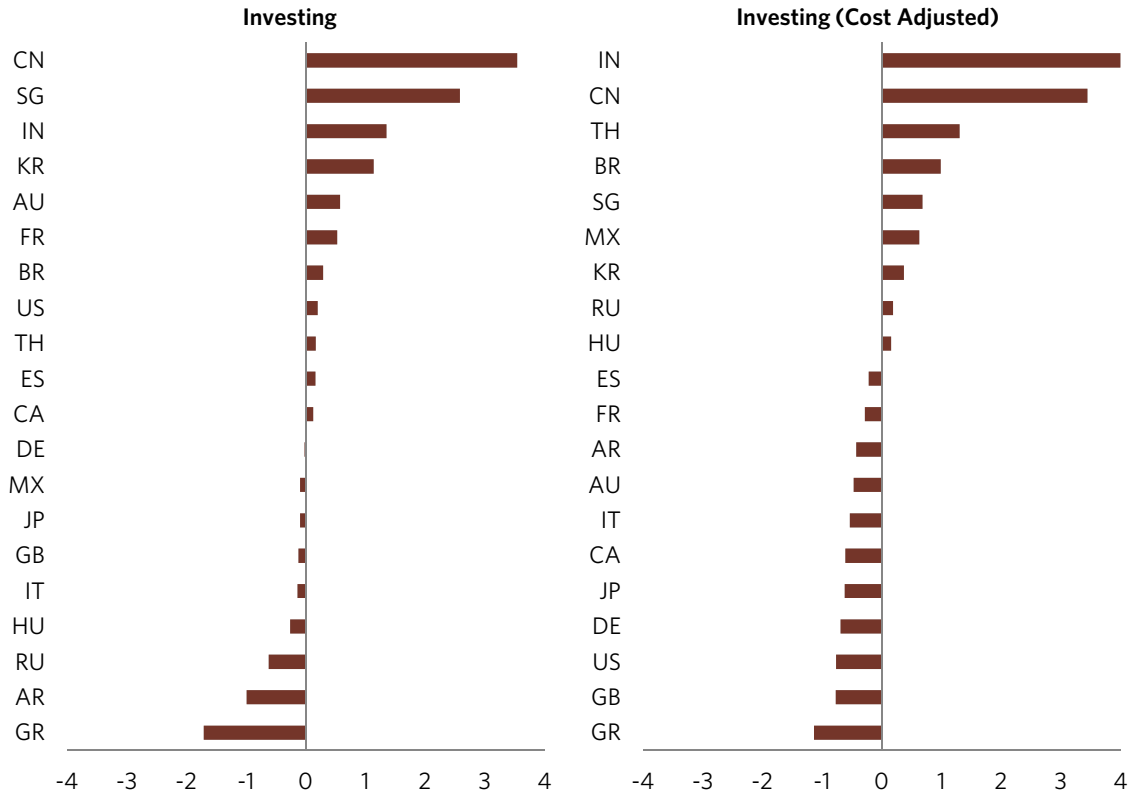


Investing

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 58% 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 have been important contributors 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, Germany, and the US are on the lower end of investing rates for the developed world once adjusted for income. Argentina, Hungary, and Russia have some of the lowest investment rates in the emerging world (with investment in Argentina 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 flip side, we become more concerned about the US and the UK 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.)

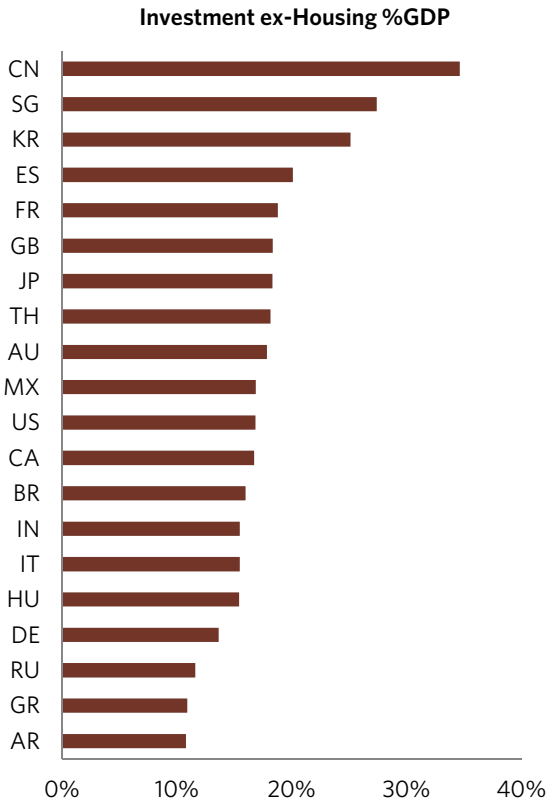


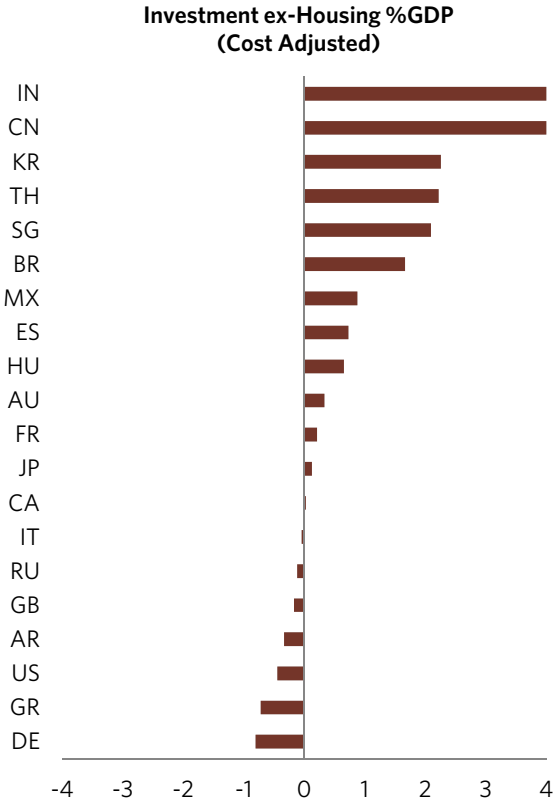
Investing Subcomponent: Aggregate Fixed Investment Rates

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 below the cut—investment levels in those countries stagnated for some time. The impact of adjusting for cost puts India at the top just above China, and Germany and the US move closer to the bottom, with Japan modestly above them.



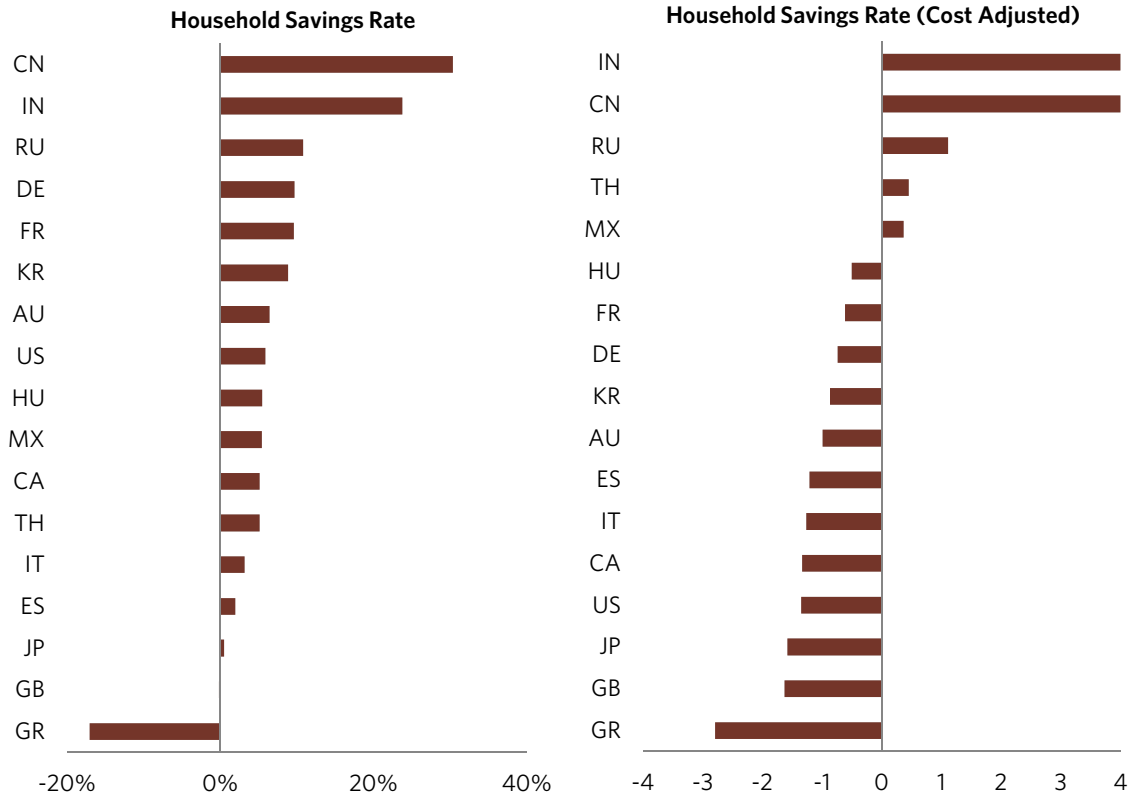


Investing Subcomponent: Household Savings Rates

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 when 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 UK and Japan are notably lower. Adjusting for cost levels again widens 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

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 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 are more commercially minded in harvesting them. On the other hand, it makes 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 toward 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 its 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).

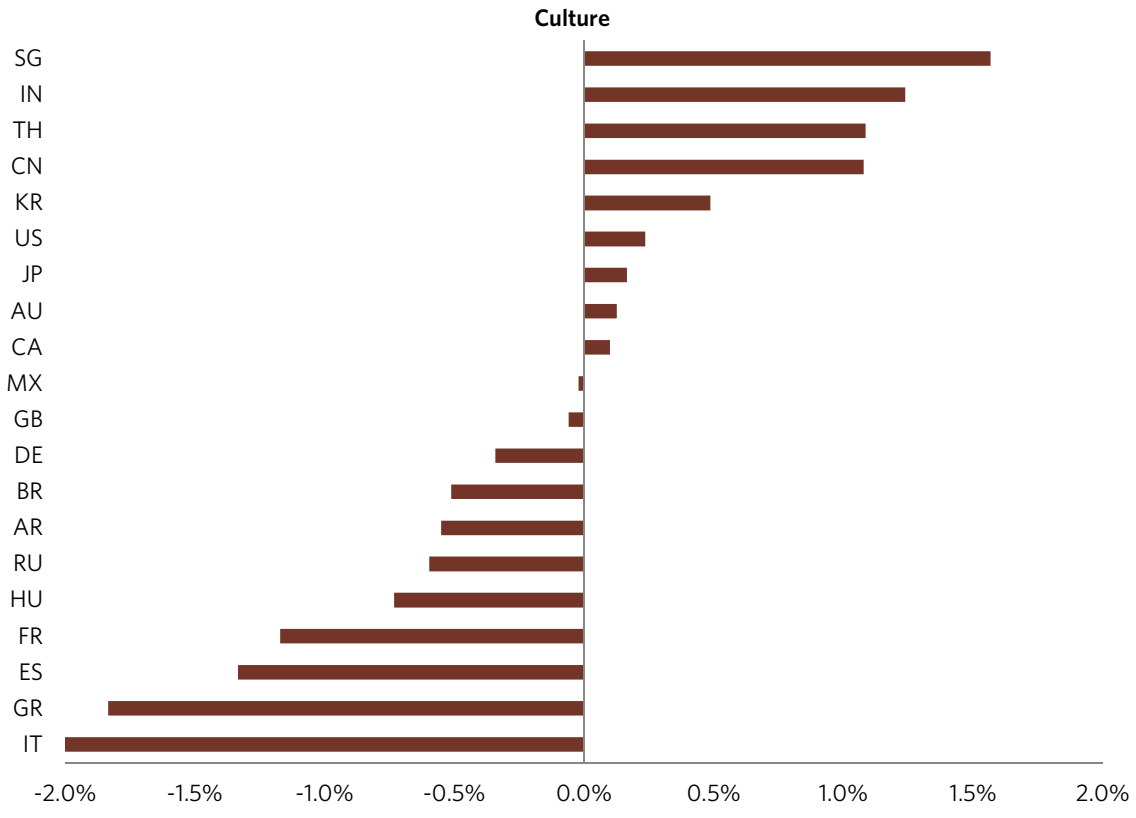
For the reasons we have described above, the culture gauge focused on the elements of culture we believe matter most for a country's future growth: 1) self-sufficiency, 2) savoring life versus achieving, 3) whether its society fosters innovation and commercialism, 4) bureaucracy, 5) corruption, and 6) 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 62% correlated with future growth.

Culture	**Correlation to Growth**	**Contribution to Estimate**
Aggregate	**62%**	**20%**
Self-Sufficiency ex-Income Effect (3 pieces, 9 sub-pieces)	42%	3.3%
Savoring Life vs Achieving ex-Inc (2 pieces, 8 sub-pieces)	37%	3.3%
Innovation & Commercialism ex-Inc (2 pieces, 10 sub-pieces)	65%	3.3%
Bureaucracy ex-Inc (3 pieces)	43%	3.3%
Corruption ex-Inc (4 pieces)	63%	3.3%
Rule of Law ex-Inc (4 pieces)	59%	3.3%

Again, the way we think about culture is that a country's competitiveness and productivity are 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.

In the following paragraph, we look at our culture indicator's current readings before diving into its individual pieces and describing our logic behind them in more depth.

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, China, and Korea. 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 offsets 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 material drags 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.



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.

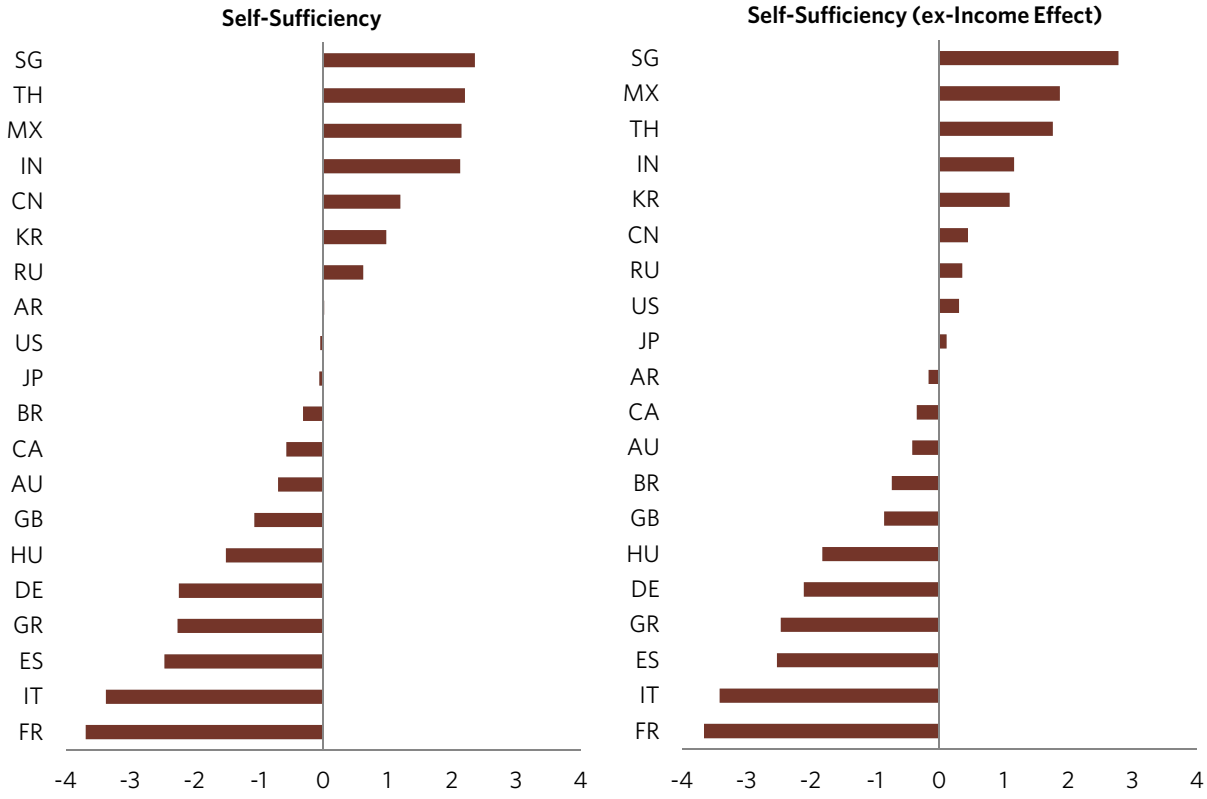
Below, we show how self-sufficiency varies by country and how it has been correlated with subsequent economic growth. You will see that there are significant differences in self-sufficiency levels between countries and that these differences occur for different reasons. For example, in some cases they 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 weighted 50% on how hard a society works and 50% on 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.

Self-Sufficiency	Correlation to Growth	Contribution to Estimate
Aggregate ex-Income Effect	**42%**	**100%**
Aggregate	**52%**	--
Work Ethic	**49%**	**50%**
Average Hours Worked	53%	25%
Labor Force Participation	32%	8.3%
Effective Retirement Age (% of Life Expectancy)	32%	8.3%
Actual Vacation + Holidays Per Year	46%	8.3%
Government Support	**44%**	**25%**
Transfer Payments to HH, % PGDP	60%	12.5%
Gov Outlays as % of PGDP	46%	12.5%
Rigidity of Labor Market	**9%**	**25%**
Collective Bargaining as % of Workforce	40%	8.3%
Ease of Hiring/Firing	26%	8.3%
Minimum Wage as % of Average Income	-15%	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, Singapore and Thailand are measured as most self-sufficient, followed by other Asian countries and Mexico. The US is in 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.

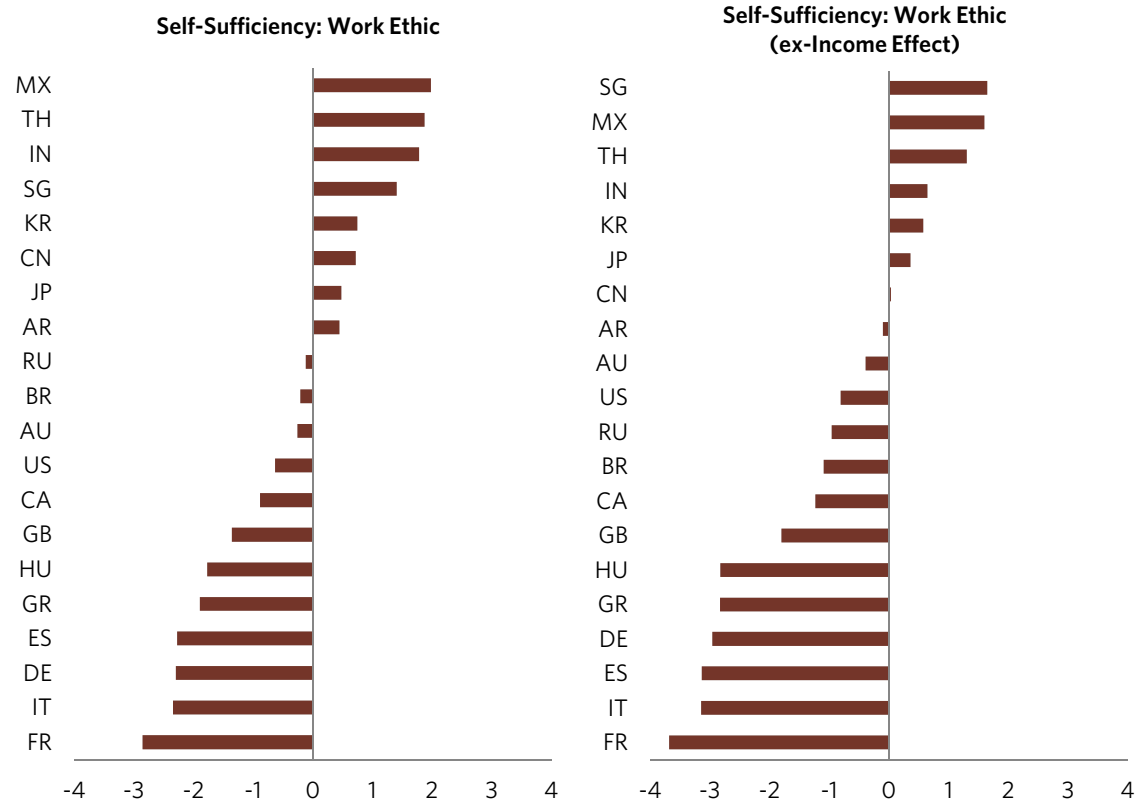


Self-Sufficiency Subcomponent: Work Ethic

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 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 on female participation 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, Thailand, and Mexico. Overall, emerging Asia and Latin America come through as working the hardest. Among rich countries, Singapore and then Japan have the hardest workers. The US is fairly hardworking 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 hardworking (as do Korea and Singapore). Brazil moves 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.



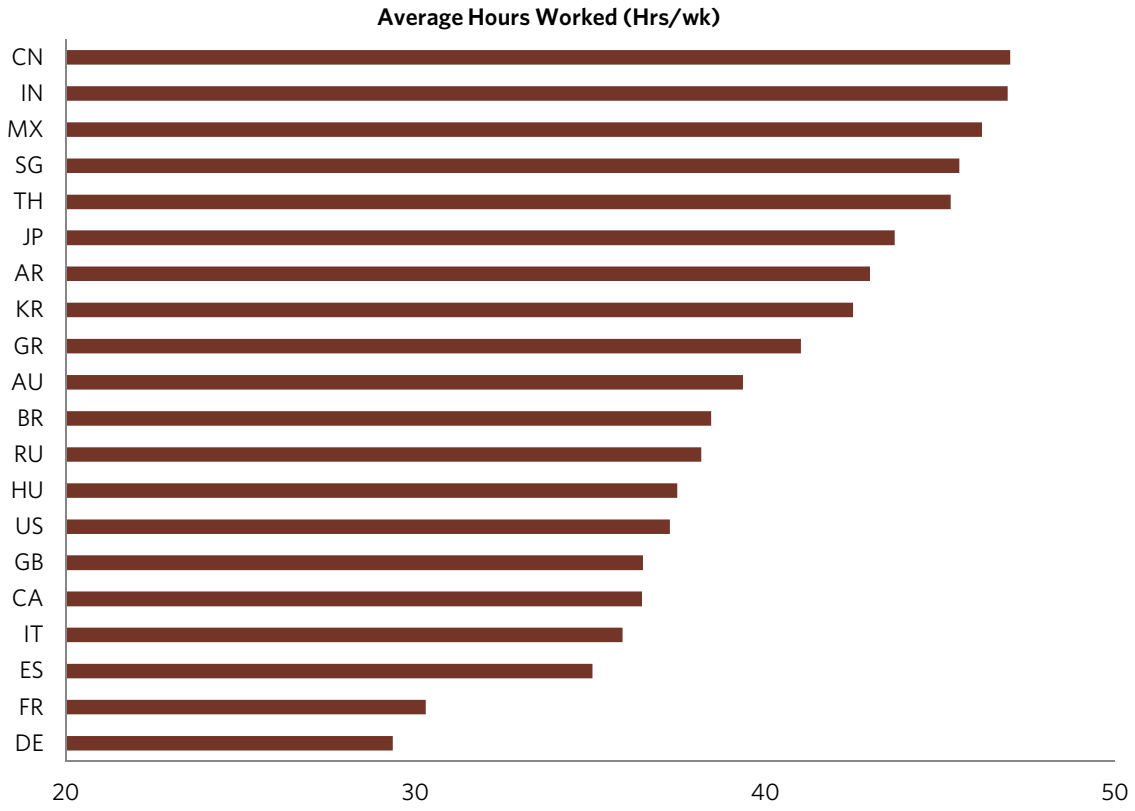
Below, we show the individual pieces of our work ethic gauge.

Work Ethic Measures

Country	MX	TH	IN	SG	KR	CN	JP	AR	RU	BR	AU	US	CA	GB	HU	GR	ES	DE	IT	FR
Avg. Actual Hours Worked (Hrs/wk)	35	36	36	34	30	35	29	30	26	28	27	24	24	23	20	21	19	18	19	17
Male Reported Avg. Hours Worked (ex-Vacation)	46	45	47	46	43	47	44	43	38	38	39	37	36	37	37	41	35	29	36	30
Labor Force Participation (% Working-Age Population)	80%	81%	80%	77%	72%	78%	70%	75%	72%	81%	72%	69%	71%	69%	60%	63%	66%	66%	60%	61%
Effective Retirement Age (% of Life Expectancy)	88%	---	84%	82%	90%	82%	84%	83%	84%	81%	79%	81%	78%	78%	81%	76%	76%	77%	74%	72%
Actual Vacation+Holidays Per Year (Weeks)	4.1	6.0	6.7	5.2	5.1	4.4	5.0	7.0	7.4	6.5	4.9	4.8	4.6	6.5	8.2	7.8	8.0	6.9	6.9	8.4

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 hardworking 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 China, 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 hardworking among developed countries (though Australia comes out reasonably ahead), whereas workers in Europe opt for leisure more than anyone else based on these measures.

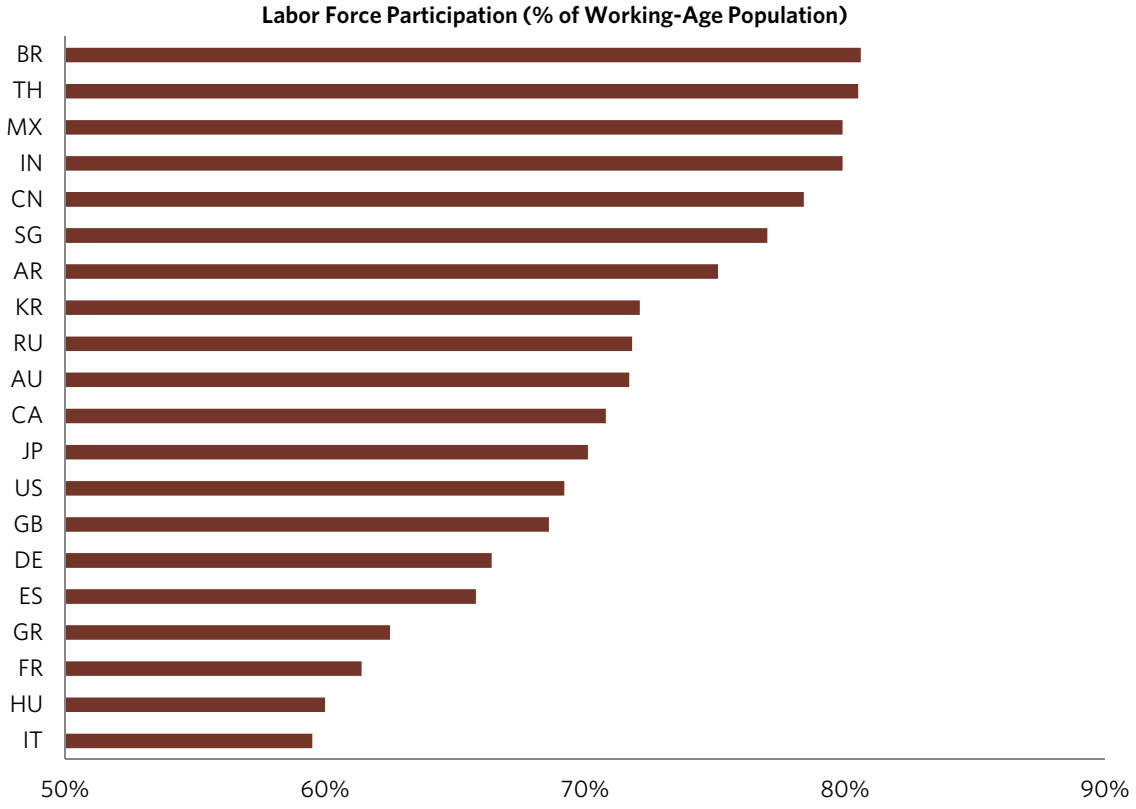


Avg. Hours Worked

Country	TH	IN	CN	MX	SG	KR	AR	JP	BR	AU	RU	US	CA	GB	GR	HU	IT	ES	DE	FR
Avg. Actual Hours Worked per Working-Aged Male	36	36	35	35	34	30	30	29	28	27	26	24	24	23	21	20	19	19	18	17
Male Reported Avg. Hours Worked (ex-Vacation)	45	47	47	46	46	43	43	44	38	39	38	37	36	37	41	37	36	35	29	30
Male Labor Force Participation	81%	80%	78%	80%	77%	72%	75%	70%	81%	72%	72%	69%	71%	69%	63%	60%	60%	66%	66%	61%
Unemployment Rate (10yr Avg.)	1%	4%	4%	5%	2%	3%	8%	4%	9%	5%	6%	7%	7%	7%	17%	9%	9%	18%	7%	9%

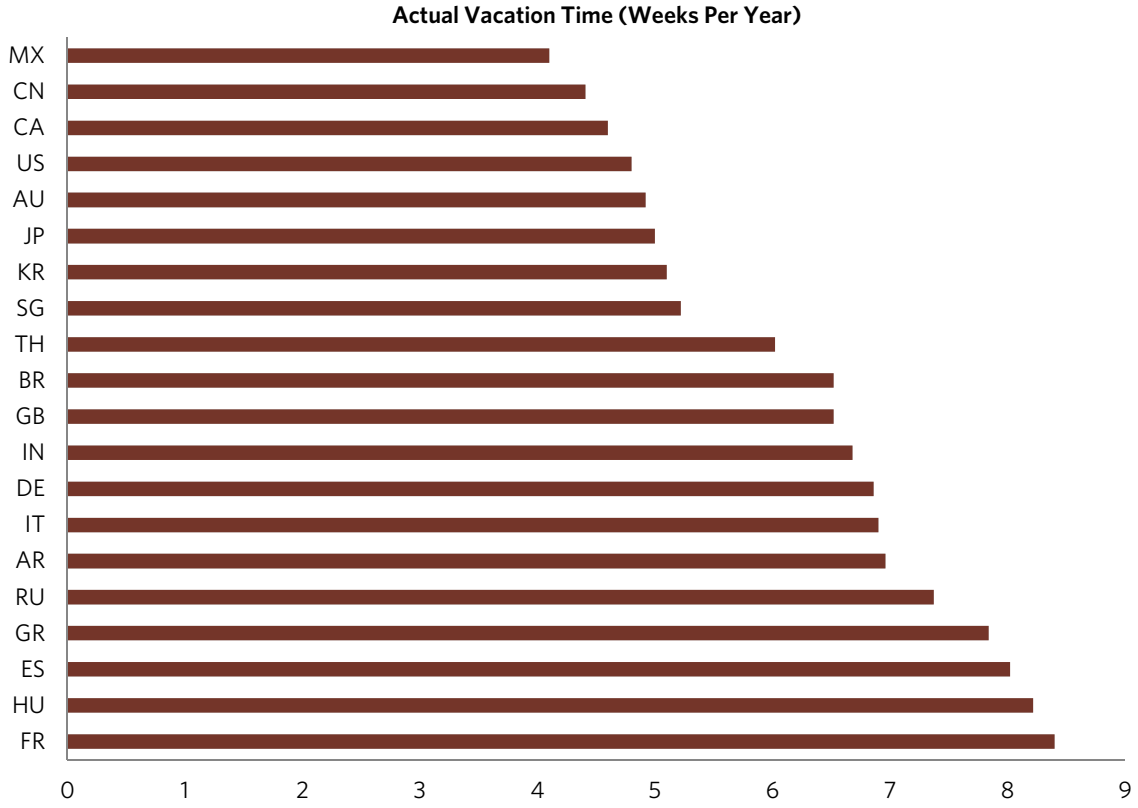
Self-Sufficiency Subcomponent: Work Ethic—Labor Force Participation

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, Thailand, Mexico, India, 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.



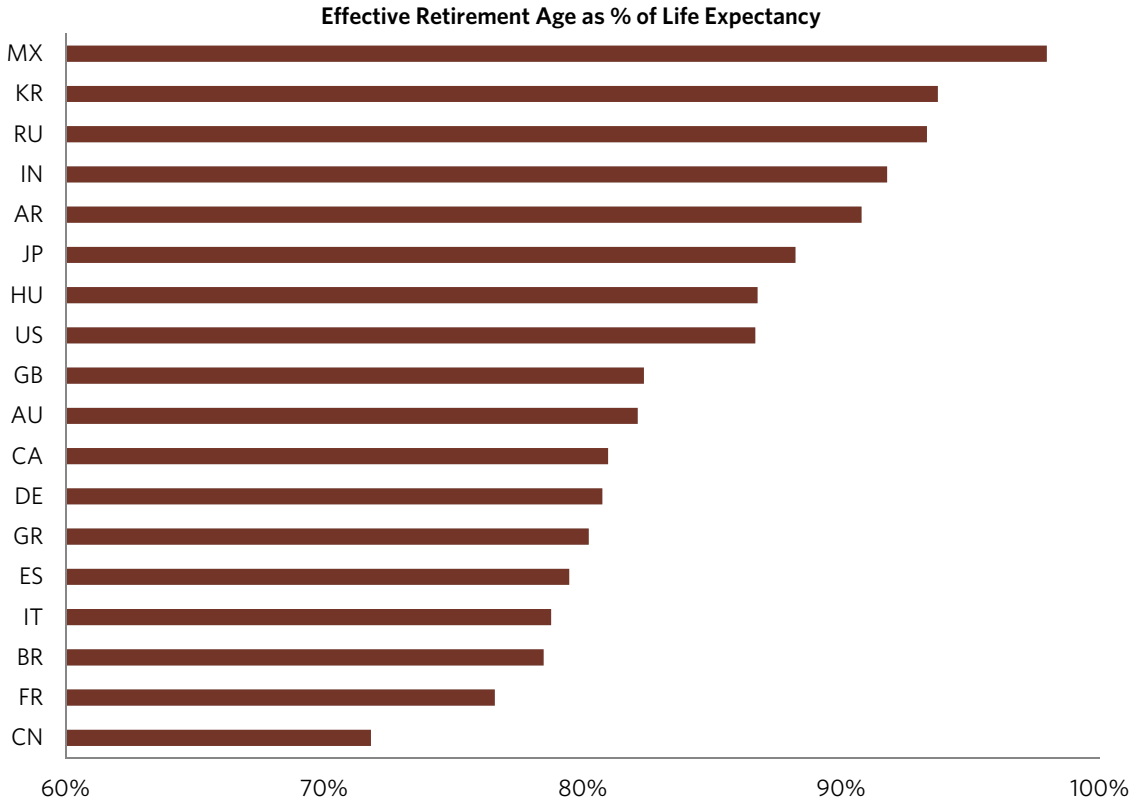
Self-Sufficiency Subcomponent: Work Ethic—Actual Vacation Time

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. Mexico and China are at the top of the list, with the average vacation time taken and holidays adding up to around four weeks per year. The norm in the US is about four to five weeks. French and Spanish workers appear to take some of the most vacation, with Italian and Greek workers not far behind. On average, Europeans take seven to eight weeks of time off work per year.



Self-Sufficiency Subcomponent: Work Ethic—Retirement Age

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 in the middle of the pack. Japanese and US workers appear to work over 80% 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.

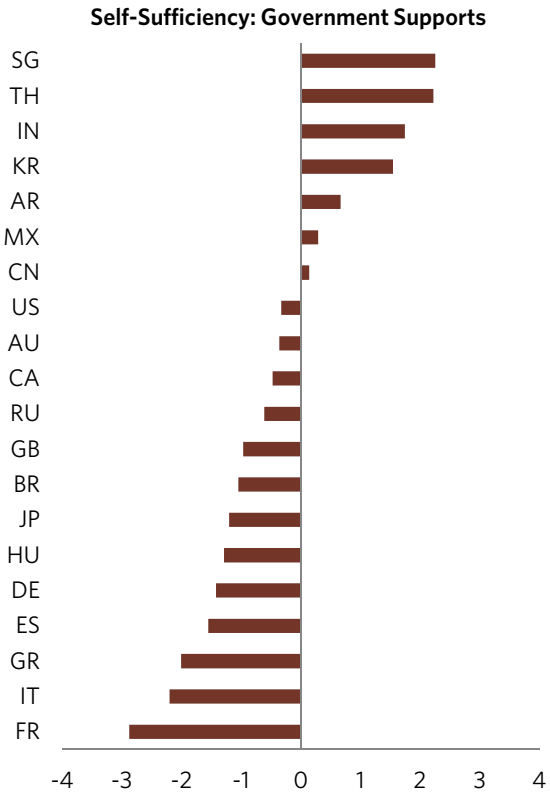


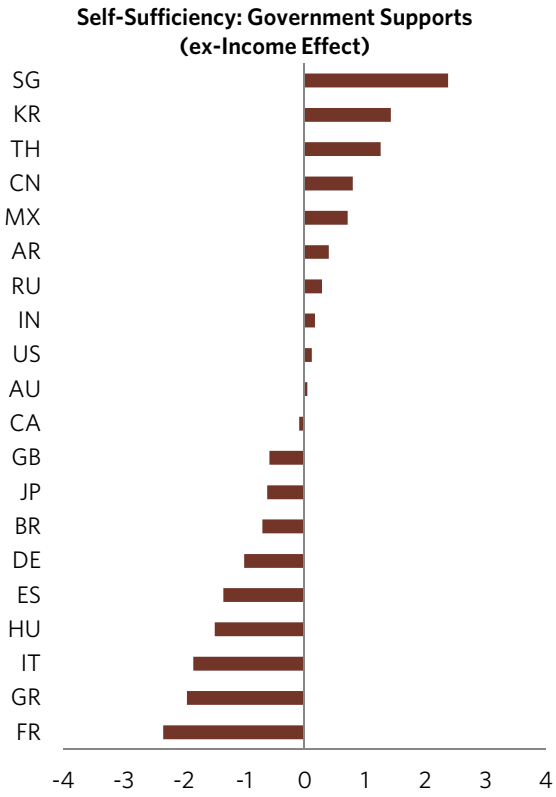
Self-Sufficiency Subcomponent: Government Supports

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, 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. Singapore ranks at the top, largely because its limited amount of government support is unusual given the wealth of the country. Greece and France end up looking particularly bad on this measure.





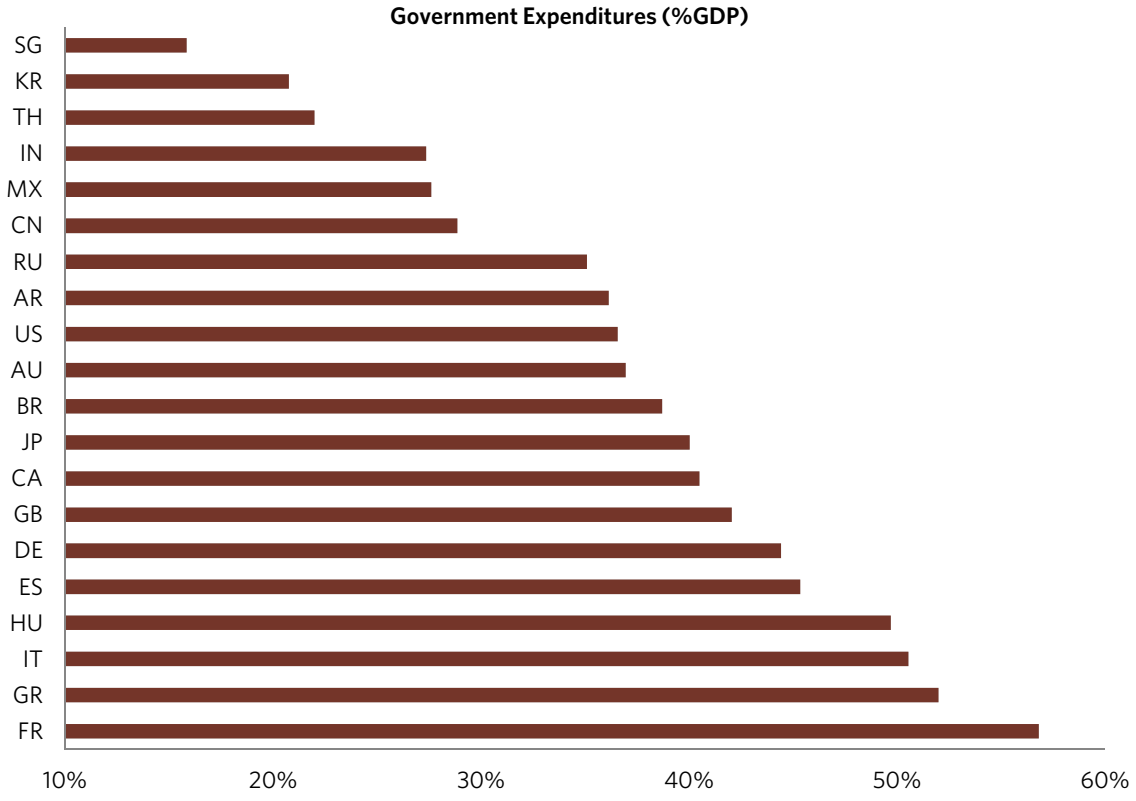
In the table below, we show how each country ranks along the sub-pieces of our government supports measure.

Government Support Measures

Country	SG	TH	IN	KR	AR	MX	CN	US	AU	CA	RU	GB	BR	JP	HU	DE	ES	GR	IT	FR
Transfer Payments to HH, % PGDP	6%	3%	4%	10%	8%	8%	6%	19%	19%	17%	12%	22%	16%	22%	20%	25%	25%	26%	28%	31%
Gov Outlays, % PGDP	16%	22%	27%	21%	36%	28%	29%	37%	37%	40%	35%	42%	39%	40%	50%	44%	45%	52%	51%	57%

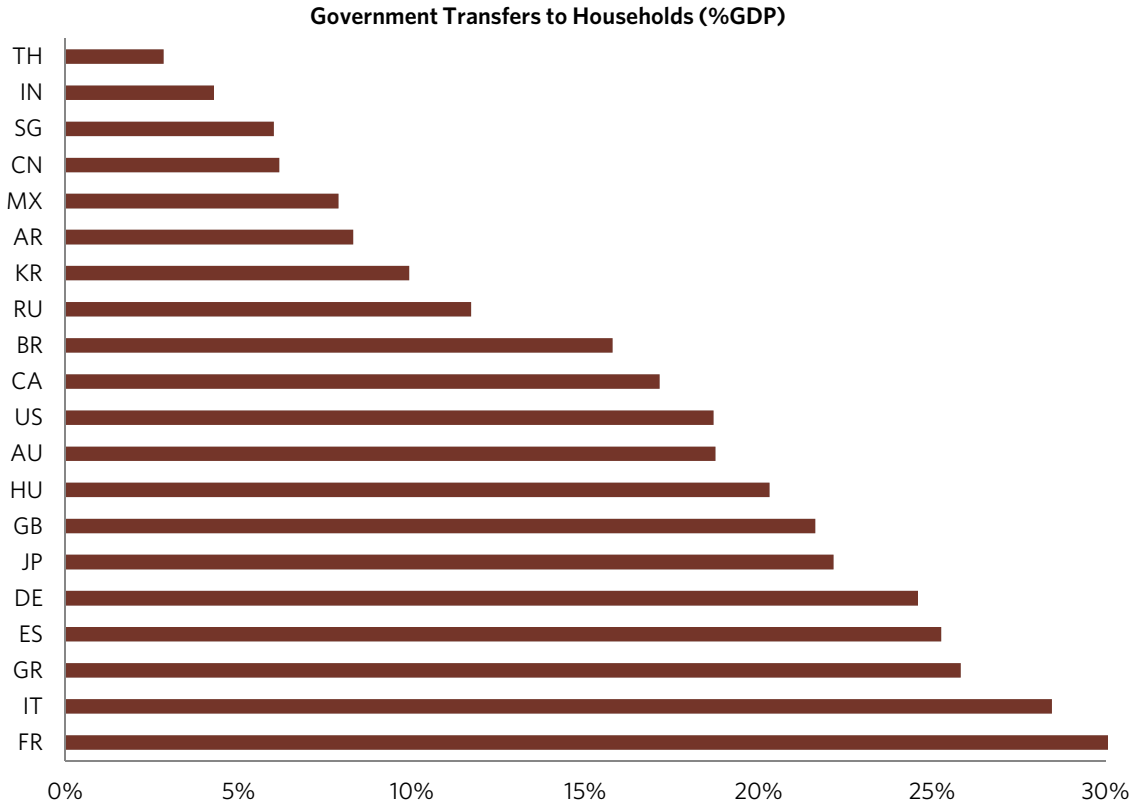
Self-Sufficiency Subcomponent: Government Supports—Government Expenditures

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, while China's government has increased its outlay but is still relatively high on the list at spending a little bit under 30%. India is a bit higher up in the top quartile, with government spending around 25% of GDP. There is some variation among Latin American countries, with Mexico's government outlays close to India, and Argentina's and Brazil's governments 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 60% 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 trade-off 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 Thailand and India's governments are the least redistributive, by our measures. In both countries, transfers to households are less than 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 around 25% to over 30% in France.

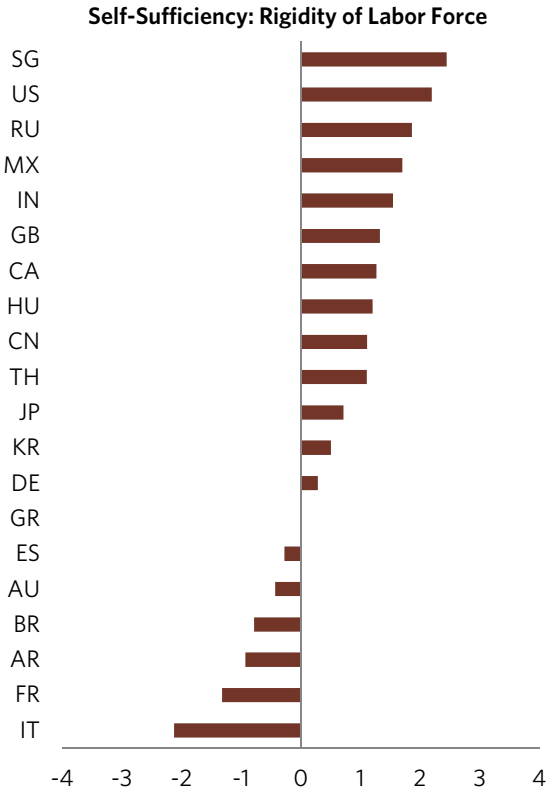


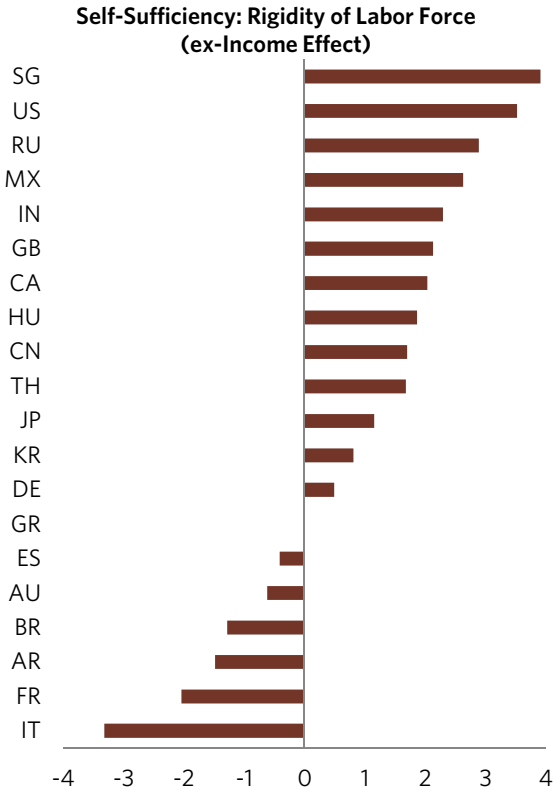
Self-Sufficiency Subcomponent: Labor Market Rigidity

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 and collective bargaining contracts 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 collective bargaining coverage 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, the US, and Russia rank as having the least rigid labor forces, followed by Mexico. Italy and France score especially poorly along this measure. 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.





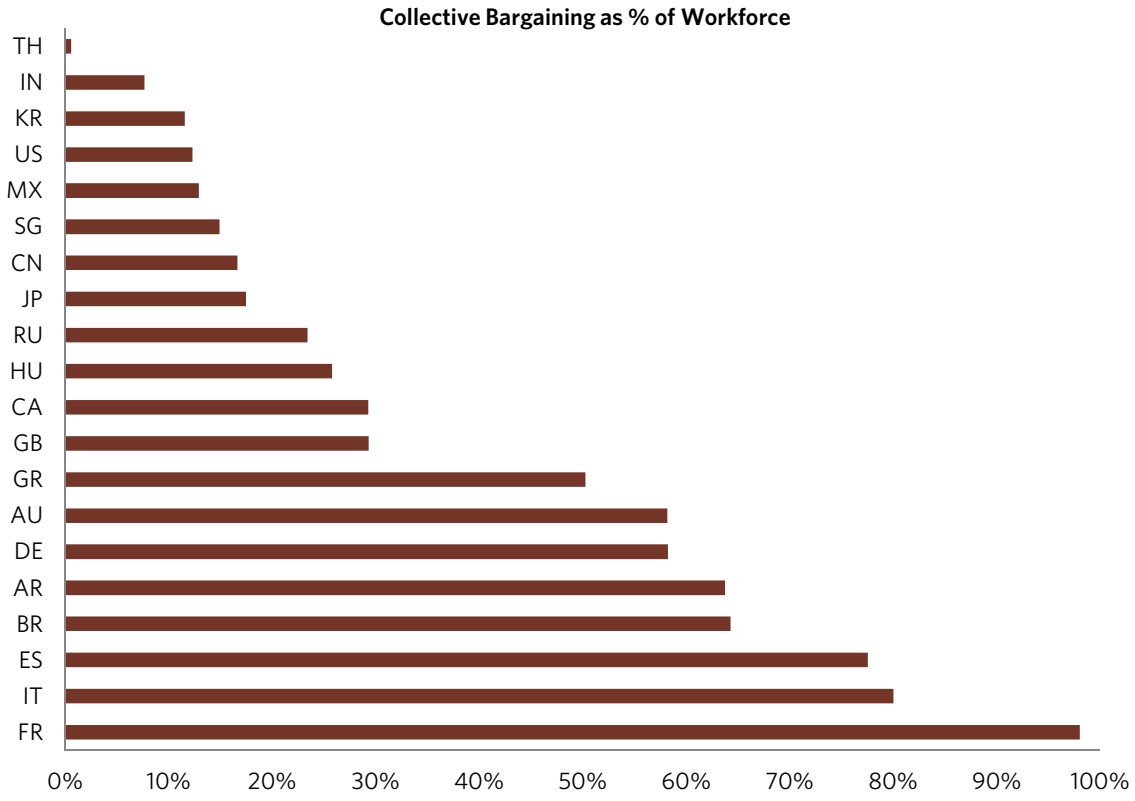
Below we show the values for each country for the three sub-pieces of labor market rigidity.

Rigidity of Labor Market Measures

Country	SG	US	RU	MX	IN	GB	CA	HU	CN	TH	JP	KR	DE	GR	ES	AU	BR	AR	FR	IT
Collective Bargaining as % of Workforce	15%	12%	23%	13%	8%	29%	29%	26%	17%	1%	17%	12%	58%	50%	78%	58%	64%	64%	98%	80%
Ease of Hiring/Firing (Z)	3.2	2.5	0.8	-0.1	1.9	2.5	2.0	1.3	1.4	1.3	-0.6	-0.6	0.8	-0.3	-0.5	-0.7	-2.7	-2.0	-1.6	-1.3
Minimum Wage as % of Average Income	---	18%	9%	10%	31%	29%	28%	25%	28%	33%	25%	30%	30%	33%	26%	32%	23%	32%	32%	55%

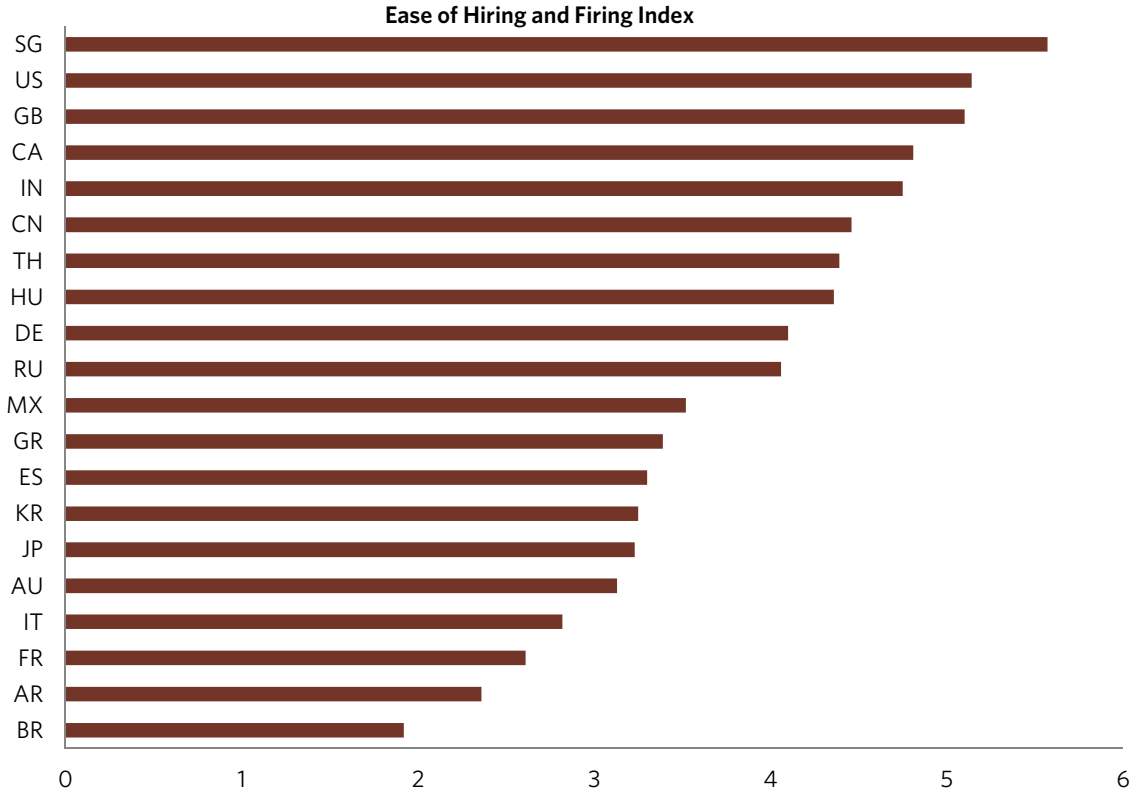
Self-Sufficiency Subcomponent: Labor Market Rigidity—Collective Bargaining

While collective bargaining rights and union membership can help give workers a stronger voice in negotiations with their employers, they also work to protect members from the pressure of other competitors in the workforce and can restrict overall labor force participation—all of which undermines self-reliance. As with other measures of labor market rigidity, collective bargaining rates have little relationship with the income of a country. The measure shows different choices within countries of similar income. Collective bargaining coverage is low in the US, Korea, Mexico, and Singapore (close to 15% and below), while coverage is very high in France, Italy, and Spain (75% and higher).



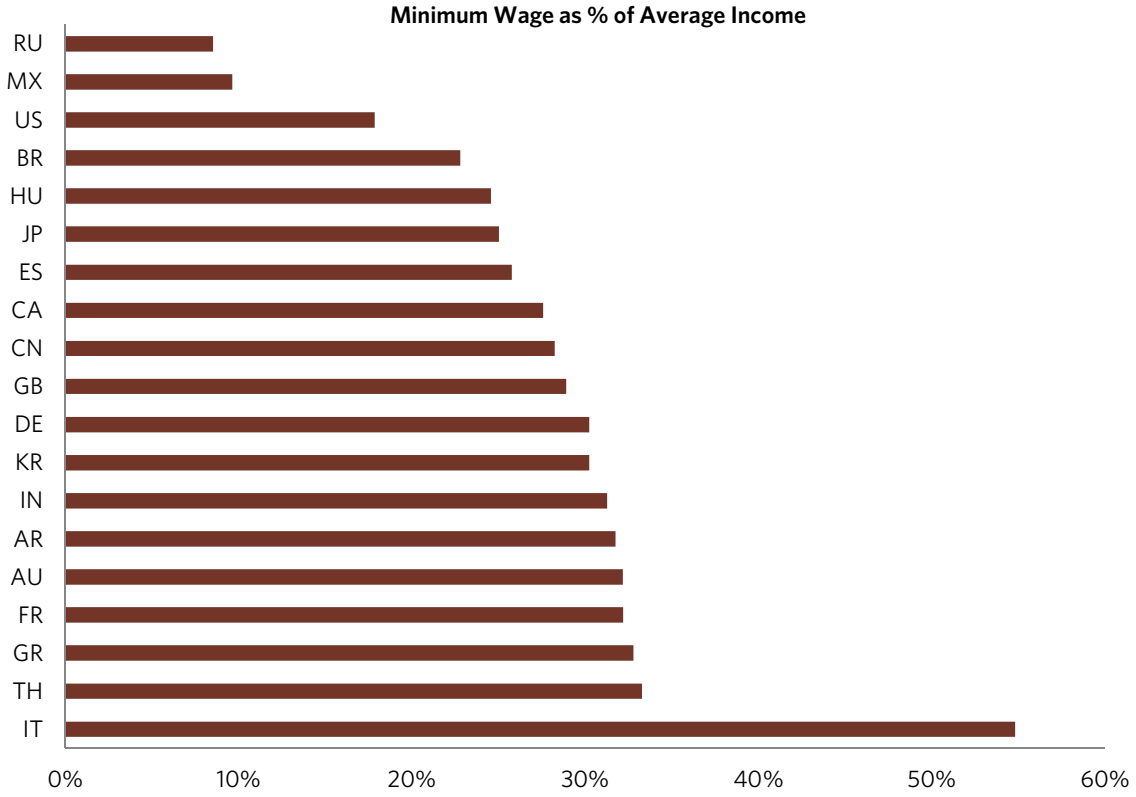
Self-Sufficiency Subcomponent: Labor Market Rigidity—Ease of Hiring and Firing

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 and Latin America—Argentina, Brazil, France, and Spain are all in the lower half of the table.



Self-Sufficiency Subcomponent: Labor Market Rigidity—Minimum Wage

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 collective bargaining rates, we again see quite a bit of difference across countries, even within the same income group. Russia and Mexico top the list, with the US and Brazil not far behind. On the other end we see both developed countries, like Italy, and lower-income ones, like Thailand and Argentina, which have much higher minimum wages as a percentage of incomes.



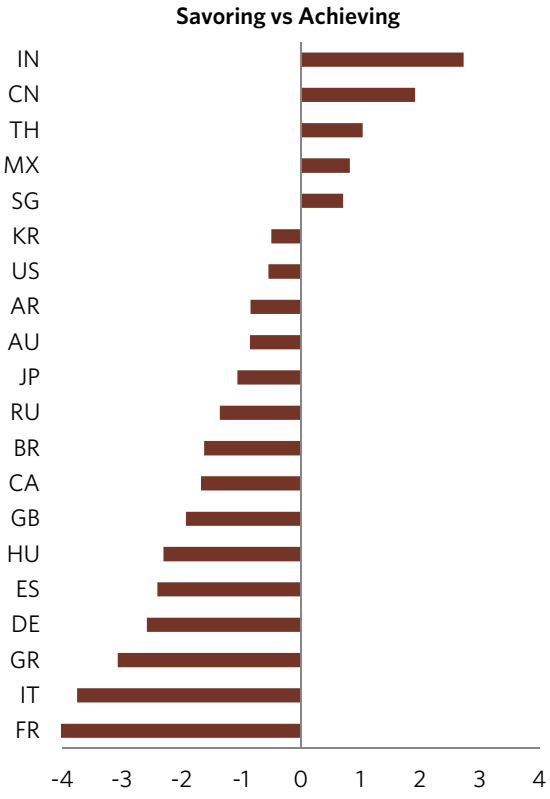
Savoring Life Versus Achieving

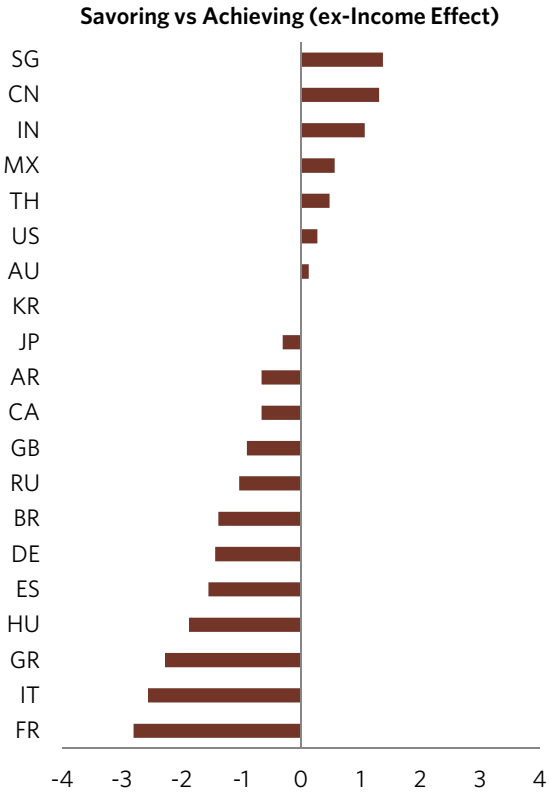
It makes intuitive sense to us that those who value achievement over savoring the fruits of life will be more successful in finding ways to work harder and smarter to become more prosperous. Of course achievement means different things to different people. When I talk about a society that values achievement I imagine one where its people prioritize professional success, creating thriving businesses and building economic security versus other goals like 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 toward leisure. Once we take into account the level of a country's income, our indicator of savoring life versus achieving is 37% correlated to growth.

Savoring Life vs Achieving	Correlation to Growth	Weight
Aggregate ex-Income Effect	**37%**	**100%**
Aggregate	**59%**	**---**
Observed Outcomes	**49%**	**50%**
Work Ethic	49%	50%
Expressed Values	**59%**	**50%**
Priority for future of country: economic growth v. having more say, defense, or making cities and countryside more beautiful	56%	7.1%
Hard work leads to success	27%	7.1%
Competition is harmful	24%	7.1%
It is important to this person to have a good time	24%	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	11%	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—Asia and the European periphery, respectively. India and China score as being most focused on achieving. The most achievement-oriented countries in the developed world are the US, Japan, and Singapore 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 hardworking 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 Subcomponent: 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 hardworking 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 and Latin America come through as working the hardest. Among more developed countries, Singapore and then Japan have the hardest working people. The US is fairly hardworking, whereas workers in Europe appear to opt for leisure more than anyone else, based on these measures.

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.

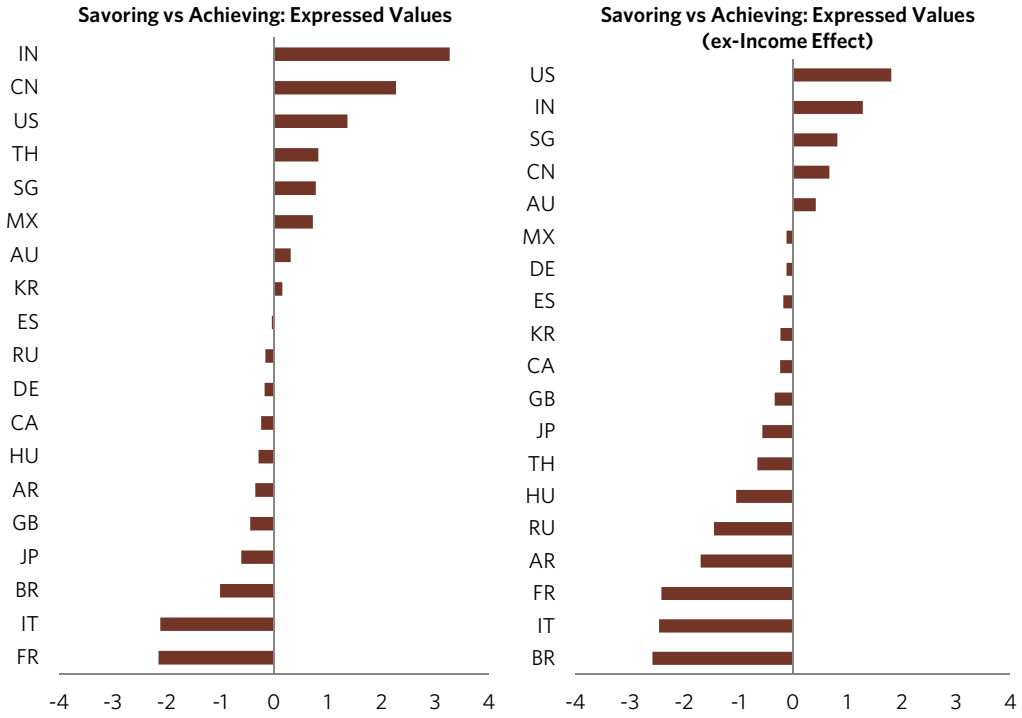
Work Ethic Measures

Country	MX	TH	IN	SG	KR	CN	JP	AR	RU	BR	AU	US	CA	GB	HU	GR	ES	DE	IT	FR
Avg. Actual Hours Worked (Hrs/wk)	35	36	36	34	30	35	29	30	26	28	27	24	24	23	20	21	19	18	19	17
Male Reported Avg. Hours Worked (ex-Vacation)	46	45	47	46	43	47	44	43	38	38	39	37	36	37	37	41	35	29	36	30
Labor Force Participation (% Working-Age Population)	80%	81%	80%	77%	72%	78%	70%	75%	72%	81%	72%	69%	71%	69%	60%	63%	66%	66%	60%	61%
Effective Retirement Age (% of Life Expectancy)	88%	---	84%	82%	90%	82%	84%	83%	84%	81%	79%	81%	78%	78%	81%	76%	76%	77%	74%	72%
Actual Vacation+Holidays Per Year (Weeks)	4.1	6.0	6.7	5.2	5.1	4.4	5.0	7.0	7.4	6.5	4.9	4.8	4.6	6.5	8.2	7.8	8.0	6.9	6.9	8.4

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. A World Values Survey asks several questions related to this topic: respondents across many countries are asked whether they agree with statements, which help reveal their attitudes towards hard work, competition, economic growth, etc. (listed in the table below). Naturally, there are challenges comparing survey data across countries, but we believe that this data combined with the observed outcomes above gives a pretty good picture of these differences in culture.

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 Italy and France place the most emphasis on savoring life. 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	TH	SG	MX	AU	KR	ES	RU	DE	CA	HU	AR	GB	JP	BR	IT	FR
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	0.9	0.2	-0.7	-1.0	-0.5	-0.7	0.5	-1.2	-1.5	0.2	-0.4	-1.7	-0.3	-0.4	-1.0	-1.6
Hard work leads to success	1.0	0.7	0.5	-1.0	-0.2	1.1	0.2	0.1	0.0	-1.3	-0.5	0.3	-0.9	-0.7	-0.3	-0.7	-0.5	-1.2	-1.3
Competition is harmful	1.7	0.4	0.5	-1.5	-1.0	0.6	0.4	-0.2	-0.4	-0.7	-0.3	0.0	-0.8	-1.4	-0.6	-0.7	-0.6	-1.0	-2.0
It is important to this person to have a good time	0.4	1.0	1.0	0.2	0.0	-1.0	1.0	-0.1	-0.4	-0.3	-0.5	0.3	-0.8	1.0	0.4	1.3	-0.9	---	-1.0
It is important to this person to be very successful	1.6	0.0	-1.0	-0.2	-0.1	0.2	-1.3	-0.2	-0.5	0.1	-0.1	-0.6	-0.3	-0.9	-1.2	-1.5	-0.7	---	-0.7
Economic growth is more important than the environment	-0.4	-1.0	0.2	0.6	1.0	-0.7	-0.6	0.2	0.1	-0.2	0.5	-1.5	0.2	-1.2	-0.7	0.0	-1.0	-0.9	-0.2

Innovation and Commercialism

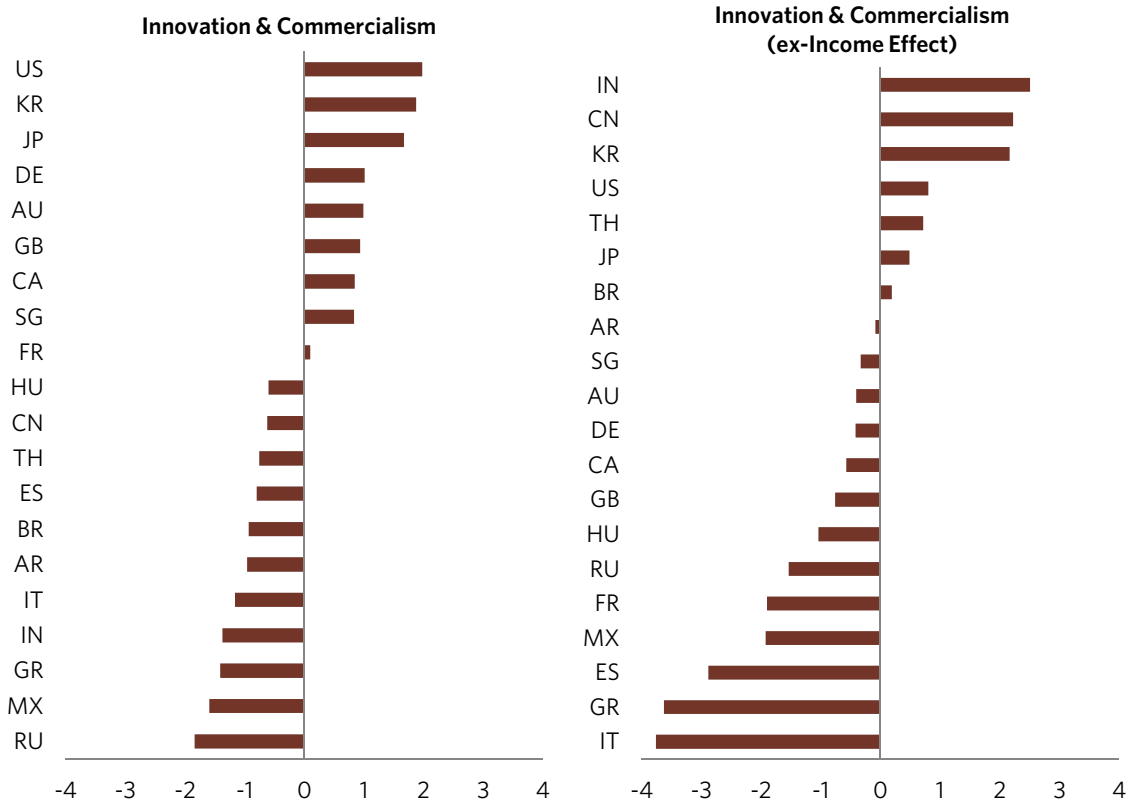
An innovative and commercial spirit is the lifeblood of a thriving economy. The drive to tinker and invent, to discover, to improve from prior failures—this is how people learn and find new and better ways of creating things of value. In a market-based system, the most powerful way to drive innovation is to bring new ideas to market and to commercialize and profit from them. The marketplace is generally efficient in weeding out the good ideas from the bad and pricing which 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 65% 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
Aggregate ex-Income Effect	**65%**	**100%**
Aggregate	**2%**	**---**
Outputs	**-15%**	**50%**
# New Patents	21%	12.5%
Royalty and license fees, payments	-15%	12.5%
# New Businesses	-6%	6.3%
% of People Creating New Businesses	25%	6.3%
# New Major Websites	-33%	6.3%
New Trademark Creation	-25%	6.3%
Inputs	**22%**	**50%**
Gross expenditure on R&D	6%	12.5%
Researchers	-11%	12.5%
Fear of Business Failure	-4%	12.5%
Entrepreneurship Prevalance	29%	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.

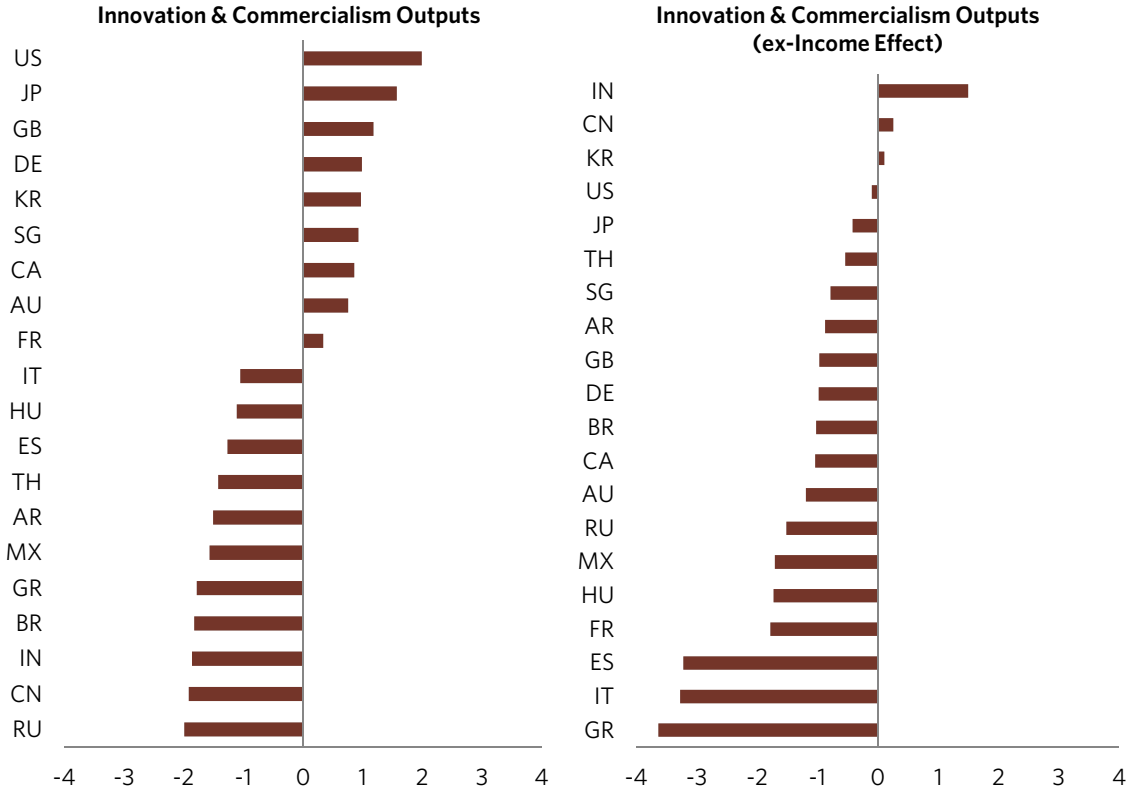
In terms of our ratings of countries on this gauge, the US and Korea rank as being the most innovative and commercially-minded on an absolute basis and are still near the top after we take out the effect of income. Korea invests a lot of capital and people toward research and has reaped the rewards in 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 second place 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. But when we adjust for income, both India and China move up a lot, especially India, which appears much more innovative. Unlike in previous years, the US no longer ranks top once adjusted for income, coming below both cheaper developing countries (China and India) and Korea. 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 their higher incomes.



Below you can see a more granular view of how each country scored for each measure.

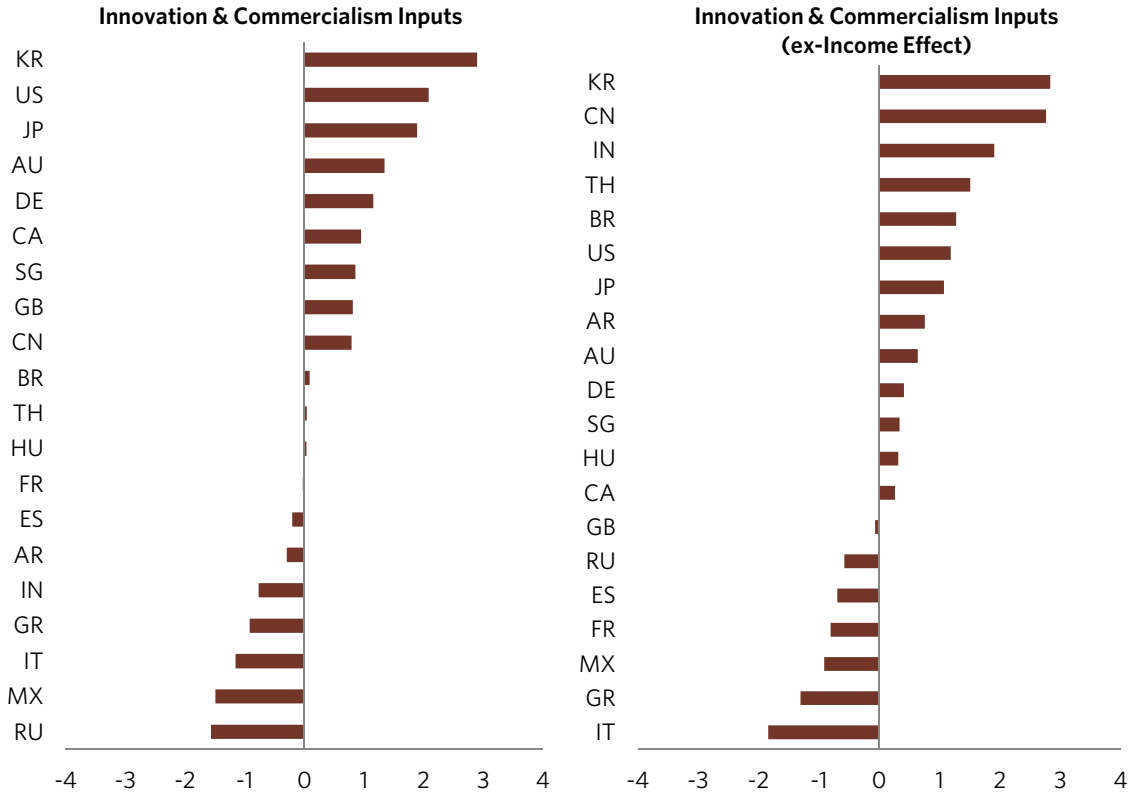
Innovation & Commercialism Outputs

Country	US	JP	GB	DE	KR	SG	CA	AU	FR	IT	HU	ES	TH	AR	MX	GR	BR	IN	CN	RU
# New Patents (per Mln Persons)	844	2,246	243	562	3,022	205	135	113	228	140	70	71	15	18	10	56	25	8	389	200
# New Businesses (per Thous Persons)	---	0	13	1	2	10	1	15	2	2	4	3	1	0	1	1	3	0	---	4
# New Major Websites (per Thous Persons, Indexed)	100	16	66	59	9	28	82	69	44	24	11	30	6	3	3	13	2	1	2	4
% of People Creating New Businesses	8	3	4	3	5	6	10	7	4	3	5	2	4	12	16	4	7	8	7	2
New Trademark Creation (Z - Score)	1.8	0.0	1.1	1.2	0.1	---	1.8	1.3	0.9	0.4	-0.9	-0.3	---	-0.8	-0.8	-0.9	-1.0	-1.0	-1.0	-1.1
Royalty and License Fees, Payments (USD/Person, Ann)	102	35	69	24	10	69	15	7	56	10	21	9	1	1	0	3	0	0	0	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, Japan, and Australia stand out as the countries most oriented toward innovation and commercialism, near the top of all countries even when adjusted for income. 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.

Innovation & Commercialism Inputs

Country	KR	US	JP	AU	DE	CA	SG	GB	CN	BR	TH	HU	FR	ES	AR	IN	GR	IT	MX	RU
Gross Expenditure on R&D (%GDP)	4.3	2.7	3.6	2.2	2.8	1.6	2.0	1.7	2.0	1.2	0.4	1.4	2.3	1.2	0.6	0.8	0.8	1.3	0.5	1.2
Researchers (per Mln Persons)	6,899	4,663	5,386	4,224	4,460	4,260	6,665	4,252	1,113	698	544	2,651	4,201	2,641	1,194	137	2,699	2,007	323	3,102
Fear of Business Failure (Z - Score)	-0.9	1.4	-1.1	-0.3	-0.4	1.1	-0.6	0.2	0.5	0.1	-1.5	0.7	-0.8	-1.0	0.7	-0.4	-2.4	-0.8	1.3	-1.0
Entrepreneurship Prevalance (% Population)	7%	7%	7%	9%	5%	9%	3%	5%	3%	19%	25%	6%	3%	8%	9%	6%	13%	5%	7%	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 43% 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**
Aggregate ex-Income Effect	**43%**	**---**
Aggregate	**-10%**	**100%**
Starting a Business	-32%	33%
Dealing with Construction Permits	-38%	33%
Burden of Government Regulation	42%	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 Brazil and India and high in Argentina, Russia, and China as well. Once you exclude the relationship between income and bureaucracy, India and China don't look quite as bad, though India is 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

Country	SG	US	AU	CA	GB	DE	JP	KR	TH	FR	MX	HU	ES	IT	GR	CN	RU	AR	BR	IN
Starting a Business	1.5	1.2	1.7	1.8	1.1	0.0	0.2	-0.2	0.1	1.2	0.4	0.4	-0.7	0.6	-0.7	-1.8	0.4	-0.8	-2.5	-3.0
Dealing with Construction Permits	1.0	1.3	1.7	0.3	1.3	1.9	0.6	1.8	0.5	0.8	-0.1	0.3	-0.4	0.0	0.3	-3.9	-3.3	-2.3	-2.1	-5.0
Burden of Government Regulation	4.0	1.0	0.1	1.2	0.7	0.6	1.2	0.4	1.1	-1.0	-0.8	-1.4	-0.4	-2.3	-1.4	2.0	-1.1	-1.5	-2.7	0.2

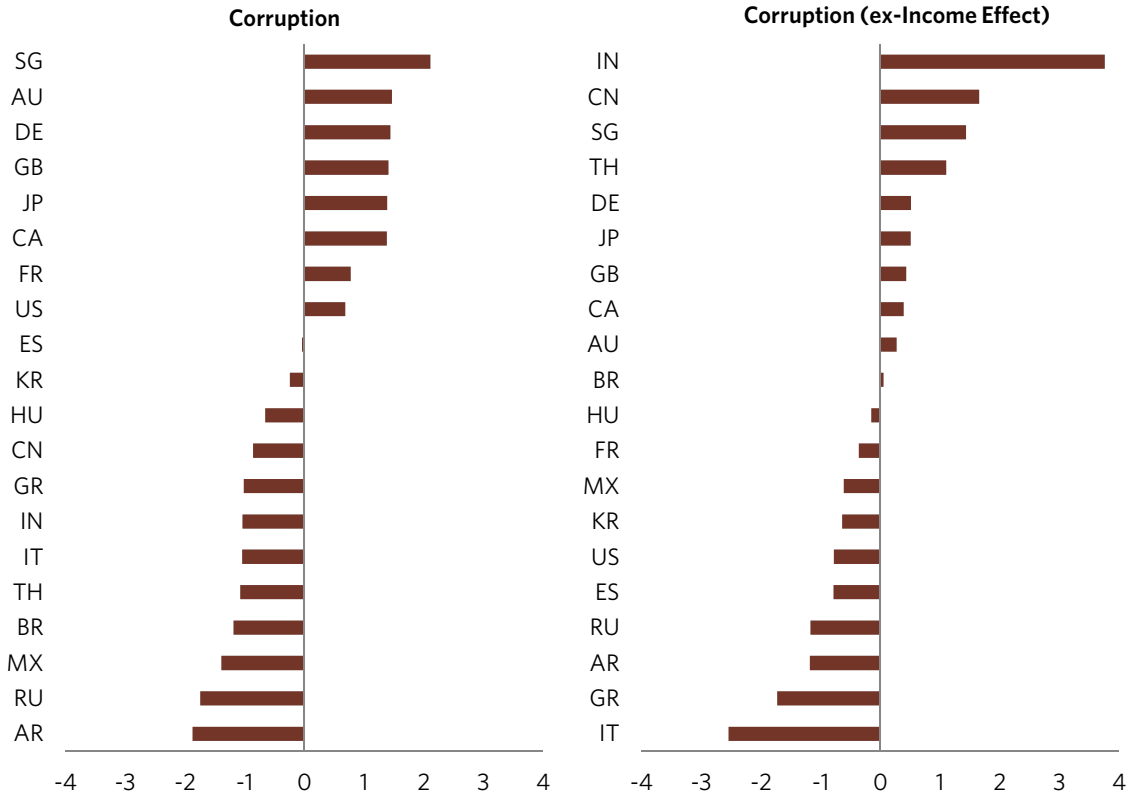
Corruption

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. Excluding the effect of income, our gauge of corruption is 63% 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**
Aggregate ex-Income Effect	**63%**	**---**
Aggregate	**-3%**	**100%**
Transparency Int'l Corruption Index	-25%	25%
Diversion of Public Funds	-2%	25%
Irregular Payments and Bribes	-10%	25%
Favoritism in Decisions of Government Officials	12%	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, the European periphery is 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 Argentina and Russia 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, with India having significantly lower corruption than any other country on an income-adjusted basis. 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.

Corruption

Country	SG	AU	DE	GB	JP	CA	FR	US	ES	KR	HU	CN	GR	IN	IT	TH	BR	MX	RU	AR
Transparency Int'l Corruption Index	1.7	1.5	1.4	1.3	1.2	1.5	0.8	1.1	0.2	-0.1	-0.2	-1.3	-0.9	-1.2	-0.9	-1.2	-0.9	-1.4	-1.8	-1.4
Diversion of Public Funds	2.3	1.7	1.5	1.7	1.1	1.3	0.9	0.8	-0.2	-0.3	-1.2	-0.5	-0.9	-0.7	-1.0	-0.9	-2.0	-1.4	-1.5	-2.2
Irregular Payments and Bribes	2.3	1.4	1.1	1.5	1.8	1.5	0.8	0.2	-0.1	-0.5	-0.7	-1.0	-1.5	-1.5	-1.1	-1.4	-1.4	-1.7	-2.0	-2.4
Favoritism in Decisions of Government Officials	3.0	1.4	1.8	1.3	1.8	1.0	0.7	-0.1	-0.5	-0.4	-1.5	0.2	-1.1	-0.5	-1.6	-0.7	-1.1	-1.2	-1.4	-2.4

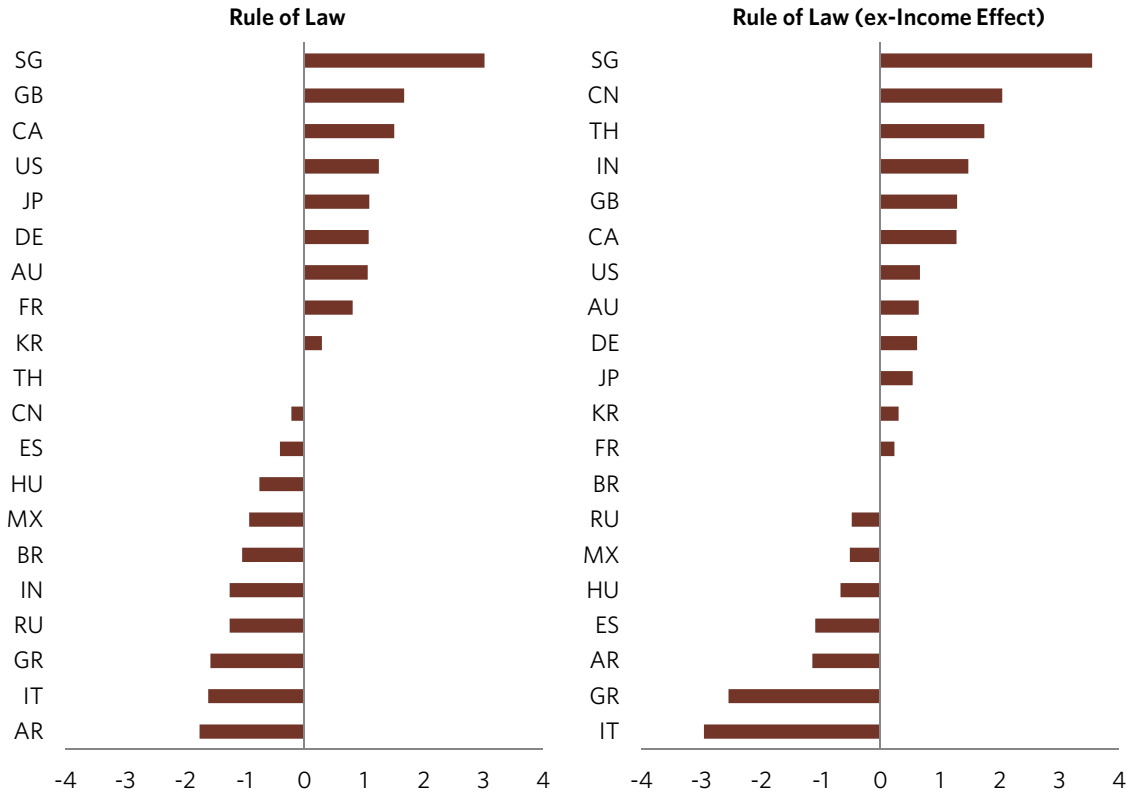
Rule of Law

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 59% 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 Growth**	**Weight**
Aggregate ex-Income Effect	**59%**	**---**
Aggregate	**7%**	**100%**
Efficiency of Legal Framework in Settling Disputes	12%	25%
Property Rights	-5%	25%
Protecting Investors	2%	25%
Enforcing Contracts	12%	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. 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 have a rule of law rating 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.

Rule of Law

Country	SG	GB	CA	US	JP	DE	AU	FR	KR	TH	CN	ES	HU	MX	BR	IN	RU	GR	IT	AR
Efficiency of Legal Framework in Settling Disputes	3.5	2.3	2.0	0.9	1.3	1.7	1.4	0.7	-0.9	-0.4	0.0	-1.0	-1.6	-1.6	-1.6	-0.2	-2.0	-2.4	-3.0	-2.5
Property Rights	2.7	2.1	2.2	1.1	2.0	2.3	1.9	1.7	0.1	-1.0	-0.3	0.2	-0.8	-1.3	-0.9	-0.4	-3.1	-0.5	-0.7	-3.6
Protecting Investors	2.9	1.8	2.0	1.7	0.5	-1.0	-0.5	-0.6	0.2	0.8	-1.4	-0.7	-1.7	-0.6	-0.6	-0.1	-1.3	-2.0	-0.2	-1.0
Enforcing Contracts	2.9	0.5	-0.2	1.3	0.6	1.4	1.5	1.5	1.8	0.5	0.9	-0.1	1.1	-0.1	-1.1	-4.3	1.3	-1.4	-2.5	0.1

Appendix B: 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 and Appendix A. 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	RU	CN	TH	MX	BR	HU	KR	AR	SG	GR	CA	JP	US	GB	AU	ES	DE	IT	FR
Cost of a Quality-Adjusted Educated Worker rel. to the US	-93%	-85%	-83%	-81%	-76%	-69%	-58%	-57%	-54%	-36%	-28%	-10%	-10%	0%	4%	12%	30%	45%	56%	77%
Education Quality Relative to the US	-43%	1%	-6%	-21%	-21%	-26%	-4%	9%	-19%	18%	-8%	10%	12%	0%	4%	4%	1%	6%	-1%	2%
% of Working-Age Pop Attained at least Primary School	65%	97%	86%	75%	80%	80%	100%	96%	92%	82%	94%	97%	97%	99%	97%	97%	89%	97%	93%	97%
% of Working-Age Pop Attained at Least Secondary School	34%	83%	55%	32%	36%	36%	70%	77%	42%	68%	54%	76%	72%	90%	73%	69%	44%	76%	46%	61%
% of Working-Age Pop Attained at Least Tertiary School	5%	25%	3%	10%	10%	6%	15%	30%	3%	30%	23%	23%	19%	27%	15%	19%	15%	13%	7%	11%
NGDP Per Capita rel. to US	3%	15%	14%	11%	14%	15%	22%	48%	21%	90%	31%	75%	68%	100%	73%	89%	47%	76%	54%	67%

Cohort Level Costs

Country	IN	RU	CN	TH	MX	BR	HU	KR	AR	SG	GR	CA	JP	US	GB	AU	ES	DE	IT	FR
Cost of Tertiary Educated Worker rel. to the US, Adj. for Ed. Quality	-96%	-86%	-87%	-90%	-80%	-67%	-74%	-71%	-69%	-51%	-61%	-37%	-53%	0%	-18%	-23%	-38%	-16%	-21%	1%
Cost of Secondary Educated Worker rel. to the US, Adj. for Ed. Quality	-94%	-86%	-84%	-84%	-77%	-66%	-63%	-59%	-54%	-45%	-39%	-15%	-25%	0%	-2%	10%	1%	35%	29%	56%
Cost of Primary Educated Worker rel. to the US, Adj. for Ed. Quality	-88%	-80%	-79%	-74%	-68%	-60%	-41%	-33%	-47%	-5%	2%	26%	46%	0%	32%	41%	77%	107%	98%	131%
Cost of Literate, Uneducated Worker rel. to the US	-93%	-80%	-87%	-85%	-84%	-85%	-51%	-37%	-82%	-9%	-40%	16%	67%	0%	0%	-9%	12%	93%	3%	53%
Cost of Illiterate, Uneducated Worker rel. to the US	-94%	-79%	-91%	-89%	-89%	-93%	-47%	-38%	-86%	-38%	-44%	12%	78%	0%	-5%	-18%	-8%	101%	-8%	57%

ii. Labor Productivity

Cost of a Productivity-Adjusted Educated Worker

Country	IN	RU	TH	CN	MX	HU	BR	AR	KR	GR	SG	US	ES	CA	JP	GB	DE	IT	AU	FR
Cost of a Productivity-Adjusted Educated Worker rel. to the US	-97%	-90%	-88%	-82%	-82%	-79%	-75%	-57%	-50%	-47%	-40%	0%	5%	12%	17%	20%	29%	34%	49%	50%
Observed Productivity-Adjusted Cost rel. to the US	45%	40%	39%	-8%	36%	52%	-2%	-10%	5%	22%	26%	0%	25%	-7%	-7%	9%	26%	26%	-21%	28%
Cost of Tertiary Educated Worker rel. to the US	-98%	-86%	-92%	-88%	-84%	-75%	-76%	-74%	-68%	-64%	-42%	0%	-37%	-31%	-48%	-15%	-11%	-22%	-20%	3%
Cost of Secondary Educated Worker rel. to the US	-97%	-86%	-87%	-85%	-82%	-65%	-75%	-62%	-55%	-44%	-35%	0%	2%	-6%	-16%	2%	42%	28%	14%	60%
Cost of Primary Educated Worker rel. to the US	-93%	-79%	-80%	-80%	-75%	-43%	-71%	-57%	-26%	-6%	12%	0%	79%	39%	63%	36%	119%	96%	47%	136%
Cost of Literate, Uneducated Worker rel. to the US	-93%	-80%	-85%	-87%	-84%	-51%	-85%	-82%	-37%	-40%	-9%	0%	12%	16%	67%	0%	93%	3%	-9%	53%
Cost of Illiterate, Uneducated Worker rel. to the US	-94%	-79%	-89%	-91%	-89%	-47%	-93%	-86%	-38%	-44%	-38%	0%	-8%	12%	78%	-5%	101%	-8%	-18%	57%

iii. Working Hard

Best ← → Worst

Avg. Hours Worked

Country	TH	IN	CN	MX	SG	KR	AR	JP	BR	AU	RU	US	CA	GB	GR	HU	IT	ES	DE	FR
Avg. Actual Hours Worked per Working-Aged Male	36	36	35	35	34	30	30	29	28	27	26	24	24	23	21	20	19	19	18	17
Male Reported Avg. Hours Worked (ex-Vacation)	45	47	47	46	46	43	43	44	38	39	38	37	36	37	41	37	36	35	29	30
Male Labor Force Participation	81%	80%	78%	80%	77%	72%	75%	70%	81%	72%	72%	69%	71%	69%	63%	60%	60%	66%	66%	61%
Unemployment Rate (10yr Avg.)	1%	4%	4%	5%	2%	3%	8%	4%	9%	5%	6%	7%	7%	7%	17%	9%	9%	18%	7%	9%

Demographics

Country	IN	MX	AR	BR	ES	GB	GR	IT	CN	TH	HU	FR	JP	AU	RU	US	DE	CA	SG	KR
Projected Annual Change in Dependency Ratio	-0.3%	-0.3%	0.0%	0.1%	0.4%	0.5%	0.5%	0.6%	0.6%	0.6%	0.6%	0.7%	0.7%	0.7%	0.8%	0.9%	1.0%	1.2%	1.2%	1.4%

iv. Investing

Investing

Country	CN	SG	IN	KR	AU	FR	BR	US	TH	ES	CA	DE	MX	JP	GB	IT	HU	RU	AR	GR
Investment ex-Housing %GDP	35%	27%	15%	25%	18%	19%	16%	17%	18%	20%	17%	14%	17%	18%	18%	15%	15%	12%	11%	11%
Household Savings Rate	30%	---	24%	9%	6%	10%	---	6%	5%	2%	5%	10%	5%	0%	0%	3%	5%	11%	---	-17%

Productivity—Culture

i. Self-Sufficiency

Work Ethic Measures

Country	MX	TH	IN	SG	KR	CN	JP	AR	RU	BR	AU	US	CA	GB	HU	GR	ES	DE	IT	FR
Avg. Actual Hours Worked (Hrs/wk)	35	36	36	34	30	35	29	30	26	28	27	24	24	23	20	21	19	18	19	17
Male Reported Avg. Hours Worked (ex-Vacation)	46	45	47	46	43	47	44	43	38	38	39	37	36	37	37	41	35	29	36	30
Labor Force Participation (% Working-Age Population)	80%	81%	80%	77%	72%	78%	70%	75%	72%	81%	72%	69%	71%	69%	60%	63%	66%	66%	60%	61%
Effective Retirement Age (% of Life Expectancy)	88%	---	84%	82%	90%	82%	84%	83%	84%	81%	79%	81%	78%	78%	81%	76%	76%	77%	74%	72%
Actual Vacation+Holidays Per Year (Weeks)	4.1	6.0	6.7	5.2	5.1	4.4	5.0	7.0	7.4	6.5	4.9	4.8	4.6	6.5	8.2	7.8	8.0	6.9	6.9	8.4

Government Support Measures

Country	SG	TH	IN	KR	AR	MX	CN	US	AU	CA	RU	GB	BR	JP	HU	DE	ES	GR	IT	FR
Transfer Payments to HH, % PGDP	6%	3%	4%	10%	8%	8%	6%	19%	19%	17%	12%	22%	16%	22%	20%	25%	25%	26%	28%	31%
Gov Outlays, % PGDP	16%	22%	27%	21%	36%	28%	29%	37%	37%	40%	35%	42%	39%	40%	50%	44%	45%	52%	51%	57%

Rigidity of Labor Market Measures

Country	SG	US	RU	MX	IN	GB	CA	HU	CN	TH	JP	KR	DE	GR	ES	AU	BR	AR	FR	IT
Collective Bargaining as % of Workforce	15%	12%	23%	13%	8%	29%	29%	26%	17%	1%	17%	12%	58%	50%	78%	58%	64%	64%	98%	80%
Ease of Hiring/Firing (Z)	3.2	2.5	0.8	-0.1	1.9	2.5	2.0	1.3	1.4	1.3	-0.6	-0.6	0.8	-0.3	-0.5	-0.7	-2.7	-2.0	-1.6	-1.3
Minimum Wage as % of Average Income	---	18%	9%	10%	31%	29%	28%	25%	28%	33%	25%	30%	30%	33%	26%	32%	23%	32%	32%	55%

ii. Savoring Life vs. Achieving

Best ⟷ Worst

Work Ethic Measures

Country	MX	TH	IN	SG	KR	CN	JP	AR	RU	BR	AU	US	CA	GB	HU	GR	ES	DE	IT	FR
Avg. Actual Hours Worked (Hrs/wk)	35	36	36	34	30	35	29	30	26	28	27	24	24	23	20	21	19	18	19	17
Male Reported Avg. Hours Worked (ex-Vacation)	46	45	47	46	43	47	44	43	38	38	39	37	36	37	37	41	35	29	36	30
Labor Force Participation (% Working-Age Population)	80%	81%	80%	77%	72%	78%	70%	75%	72%	81%	72%	69%	71%	69%	60%	63%	66%	66%	60%	61%
Effective Retirement Age (% of Life Expectancy)	88%	---	84%	82%	90%	82%	84%	83%	84%	81%	79%	81%	78%	78%	81%	76%	76%	77%	74%	72%
Actual Vacation+Holidays Per Year (Weeks)	4.1	6.0	6.7	5.2	5.1	4.4	5.0	7.0	7.4	6.5	4.9	4.8	4.6	6.5	8.2	7.8	8.0	6.9	6.9	8.4

Savoring Life vs Achieving : Expressed Values

Country	IN	CN	US	TH	SG	MX	AU	KR	ES	RU	DE	CA	HU	AR	GB	JP	BR	IT	FR
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	0.9	0.2	-0.7	-1.0	-0.5	-0.7	0.5	-1.2	-1.5	0.2	-0.4	-1.7	-0.3	-0.4	-1.0	-1.6
Hard work leads to success	1.0	0.7	0.5	-1.0	-0.2	1.1	0.2	0.1	0.0	-1.3	-0.5	0.3	-0.9	-0.7	-0.3	-0.7	-0.5	-1.2	-1.3
Competition is harmful	1.7	0.4	0.5	-1.5	-1.0	0.6	0.4	-0.2	-0.4	-0.7	-0.3	0.0	-0.8	-1.4	-0.6	-0.7	-0.6	-1.0	-2.0
It is important to this person to have a good time	0.4	1.0	1.0	0.2	0.0	-1.0	1.0	-0.1	-0.4	-0.3	-0.5	0.3	-0.8	1.0	0.4	1.3	-0.9	---	-1.0
It is important to this person to be very successful	1.6	0.0	-1.0	-0.2	-0.1	0.2	-1.3	-0.2	-0.5	0.1	-0.1	-0.6	-0.3	-0.9	-1.2	-1.5	-0.7	---	-0.7
Economic growth is more important than the environment	-0.4	-1.0	0.2	0.6	1.0	-0.7	-0.6	0.2	0.1	-0.2	0.5	-1.5	0.2	-1.2	-0.7	0.0	-1.0	-0.9	-0.2

iii. Innovation and Commercialism

Innovation & Commercialism Outputs

Country	US	JP	GB	DE	KR	SG	CA	AU	FR	IT	HU	ES	TH	AR	MX	GR	BR	IN	CN	RU
# New Patents (per Mln Persons)	844	2,246	243	562	3,022	205	135	113	228	140	70	71	15	18	10	56	25	8	389	200
# New Businesses (per Thous Persons)	---	0	13	1	2	10	1	15	2	2	4	3	1	0	1	1	3	0	---	4
# New Major Websites (per Thous Persons, Indexed)	100	16	66	59	9	28	82	69	44	24	11	30	6	3	3	13	2	1	2	4
% of People Creating New Businesses	8	3	4	3	5	6	10	7	4	3	5	2	4	12	16	4	7	8	7	2
New Trademark Creation (Z - Score)	1.8	0.0	1.1	1.2	0.1	---	1.8	1.3	0.9	0.4	-0.9	-0.3	---	-0.8	-0.8	-0.9	-1.0	-1.0	-1.0	-1.1
Royalty and License Fees, Payments (USD/Person, Ann)	102	35	69	24	10	69	15	7	56	10	21	9	1	1	0	3	0	0	0	0

Innovation & Commercialism Inputs

Country	KR	US	JP	AU	DE	CA	SG	GB	CN	BR	TH	HU	FR	ES	AR	IN	GR	IT	MX	RU
Gross Expenditure on R&D (%GDP)	4.3	2.7	3.6	2.2	2.8	1.6	2.0	1.7	2.0	1.2	0.4	1.4	2.3	1.2	0.6	0.8	0.8	1.3	0.5	1.2
Researchers (per Mln Persons)	6,899	4,663	5,386	4,224	4,460	4,260	6,665	4,252	1,113	698	544	2,651	4,201	2,641	1,194	137	2,699	2,007	323	3,102
Fear of Business Failure (Z - Score)	-0.9	1.4	-1.1	-0.3	-0.4	1.1	-0.6	0.2	0.5	0.1	-1.5	0.7	-0.8	-1.0	0.7	-0.4	-2.4	-0.8	1.3	-1.0
Entrepreneurship Prevalance (% Population)	7%	7%	7%	9%	5%	9%	3%	5%	3%	19%	25%	6%	3%	8%	9%	6%	13%	5%	7%	4%

iv. Bureaucracy

Best ◄——————————————————————————————► Worst

Bureaucracy

Country	SG	US	AU	CA	GB	DE	JP	KR	TH	FR	MX	HU	ES	IT	GR	CN	RU	AR	BR	IN
Starting a Business	1.5	1.2	1.7	1.8	1.1	0.0	0.2	-0.2	0.1	1.2	0.4	0.4	-0.7	0.6	-0.7	-1.8	0.4	-0.8	-2.5	-3.0
Dealing with Construction Permits	1.0	1.3	1.7	0.3	1.3	1.9	0.6	1.8	0.5	0.8	-0.1	0.3	-0.4	0.0	0.3	-3.9	-3.3	-2.3	-2.1	-5.0
Burden of Government Regulation	4.0	1.0	0.1	1.2	0.7	0.6	1.2	0.4	1.1	-1.0	-0.8	-1.4	-0.4	-2.3	-1.4	2.0	-1.1	-1.5	-2.7	0.2

v. Corruption

Corruption

Country	SG	AU	DE	GB	JP	CA	FR	US	ES	KR	HU	CN	GR	IN	IT	TH	BR	MX	RU	AR
Transparency Int'l Corruption Index	1.7	1.5	1.4	1.3	1.2	1.5	0.8	1.1	0.2	-0.1	-0.2	-1.3	-0.9	-1.2	-0.9	-1.2	-0.9	-1.4	-1.8	-1.4
Diversion of Public Funds	2.3	1.7	1.5	1.7	1.1	1.3	0.9	0.8	-0.2	-0.3	-1.2	-0.5	-0.9	-0.7	-1.0	-0.9	-2.0	-1.4	-1.5	-2.2
Irregular Payments and Bribes	2.3	1.4	1.1	1.5	1.8	1.5	0.8	0.2	-0.1	-0.5	-0.7	-1.0	-1.5	-1.5	-1.1	-1.4	-1.4	-1.7	-2.0	-2.4
Favoritism in Decisions of Government Officials	3.0	1.4	1.8	1.3	1.8	1.0	0.7	-0.1	-0.5	-0.4	-1.5	0.2	-1.1	-0.5	-1.6	-0.7	-1.1	-1.2	-1.4	-2.4

vi. Rule of Law

Rule of Law

Country	SG	GB	CA	US	JP	DE	AU	FR	KR	TH	CN	ES	HU	MX	BR	IN	RU	GR	IT	AR
Efficiency of Legal Framework in Settling Disputes	3.5	2.3	2.0	0.9	1.3	1.7	1.4	0.7	-0.9	-0.4	0.0	-1.0	-1.6	-1.6	-1.6	-0.2	-2.0	-2.4	-3.0	-2.5
Property Rights	2.7	2.1	2.2	1.1	2.0	2.3	1.9	1.7	0.1	-1.0	-0.3	0.2	-0.8	-1.3	-0.9	-0.4	-3.1	-0.5	-0.7	-3.6
Protecting Investors	2.9	1.8	2.0	1.7	0.5	-1.0	-0.5	-0.6	0.2	0.8	-1.4	-0.7	-1.7	-0.6	-0.6	-0.1	-1.3	-2.0	-0.2	-1.0
Enforcing Contracts	2.9	0.5	-0.2	1.3	0.6	1.4	1.5	1.5	1.8	0.5	0.9	-0.1	1.1	-0.1	-1.1	-4.3	1.3	-1.4	-2.5	0.1

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