LSE EC1B5 Macroeconomics

Handout 11

Money

Key Ideas

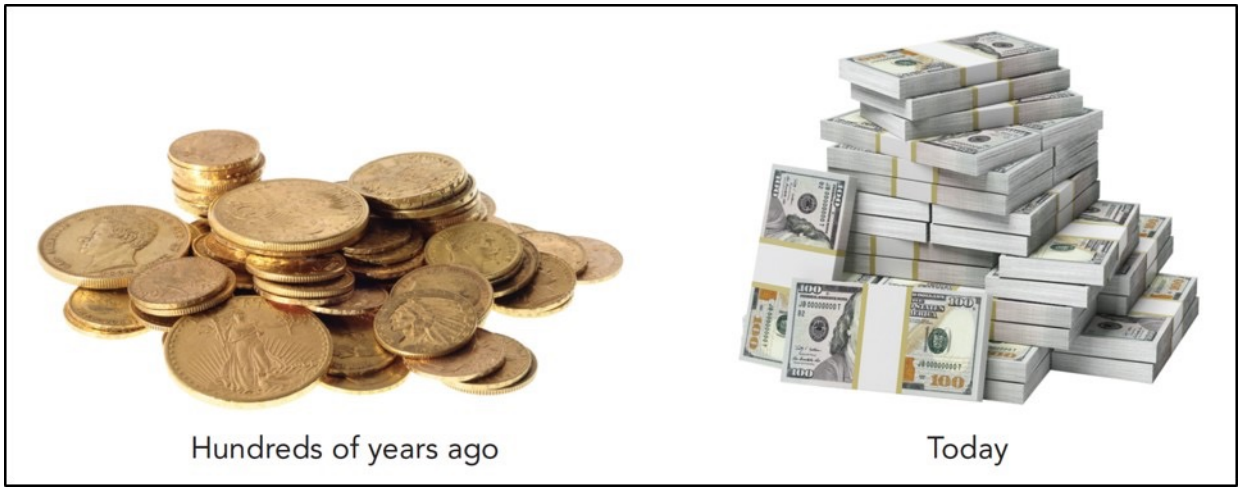
1. Money has three key roles: serving as a medium of exchange, a store of value, and a unit of account.
2. The quantity theory of money predicts that the inflation rate will equal the growth rate of the money supply minus the growth rate of real GDP.

Why Money Is Important

- Help us understand how the economy works
- What causes inflation
- How monetary policy works
- The interaction between banks, government, and central bank
- Opportunities and risks

Money

Money is an asset that people use to make and receive payments when buying and selling goods and services.



Money

Money is an asset that people use to make and receive payments when buying and selling goods and services. It serves three functions in a modern economy:

1. It is a medium of exchange.
2. It is a store of value.
3. It is a unit of account (measure of worth).

Money as a medium of exchange

- Money – as a **medium of exchange,** is an asset that can be traded for goods and services.

- An alternative to *barter* which requires "*double coincidence of wants*"

Medium of Exchange

- Banks: settle transactions among themselves using with **reserves**, using their accounts at the central bank, known as reserve accounts.
- **Banknotes and coins** are used as a medium of exchange (mainly by individuals) in many small-lot transactions.
- Individuals and businesses mainly use **checking and demand deposit accounts** to settle their transactions

Money as a store of value

- Money as **store of value,** is an asset that enables people to transfer purchasing power into the future.

- Perishable?

  Imagine storing apple for how long?

Money

Question: What function(s) does each item fulfill?

	Function		
	Medium of Exchange	Store of Value	Unit of Account
Item			
Sea shell			
Gold coin			
Cow			
U.S. dollar			
Bitcoin			

Money

Answer:

Item	Function		
	Medium of Exchange	Store of Value	Unit of Account
Sea shell	YES	NO	YES
Gold coin	YES	YES	YES
Cow	YES	YES	NO
U.S. dollar	YES	YES	YES
Bitcoin	YES	YES	YES

Money as a unit of account

- Money as a **unit of account,** is a universal yardstick that is used to express relative prices of goods and services.

- Homogeneity? Divisibility?

  Imagine if measured in terms of number of apples but apples are of different size.

Money

The U.S. dollar and other national currencies are examples of fiat money.

Fiat money

An asset that is used as legal tender by government decree and is not backed by a physical commodity like gold.

Fiat Money

Examples of fiat money:
Pound Sterling **£**, U.S. **$**, Euro **€** other national currencies.

Fiat money

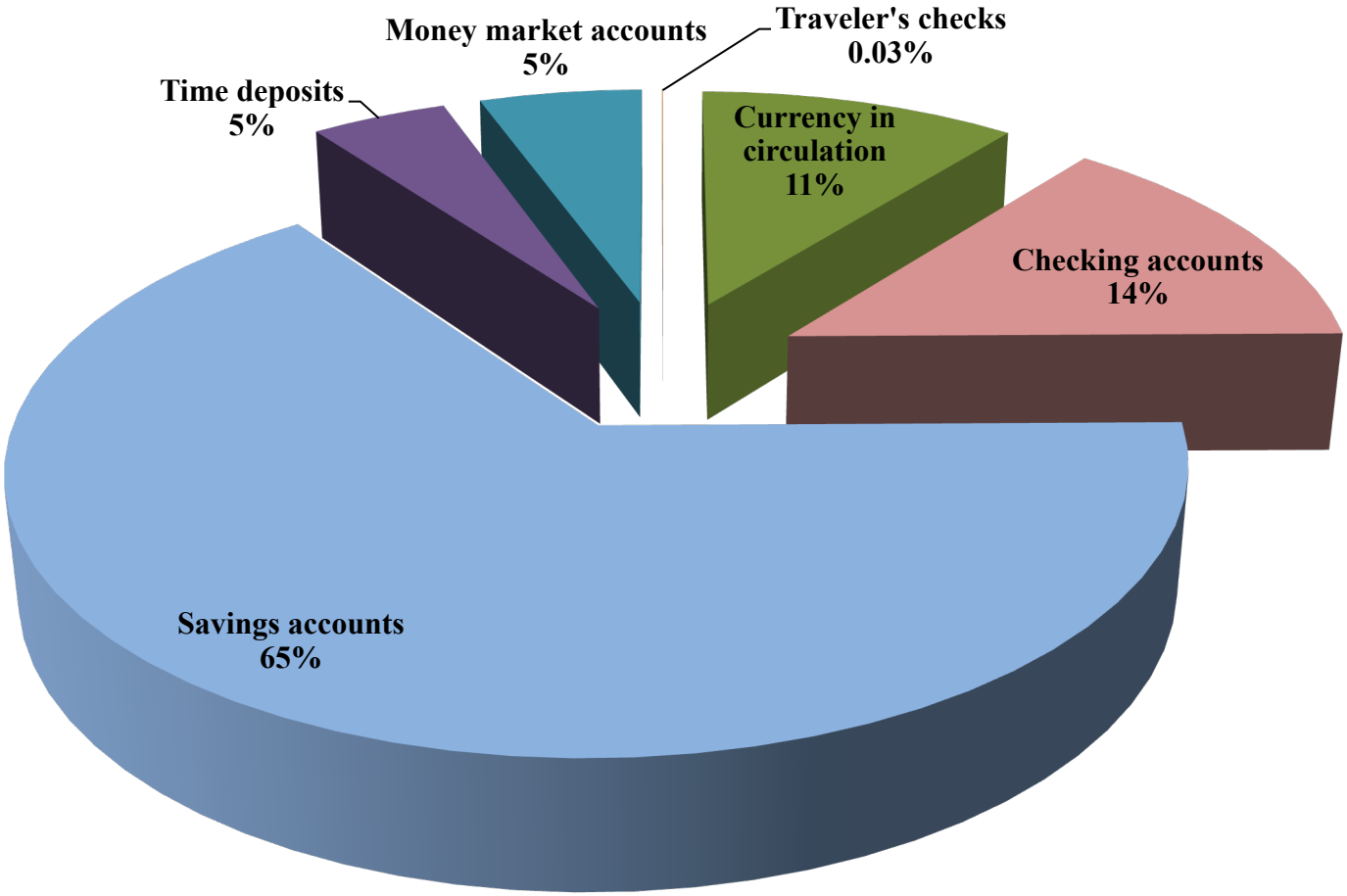
- Money in modern world is fiat money
- An asset that is used as legal tender by government decree and is not backed by a physical commodity like gold.
- No intrinsic value, i.e. zero "direct" utility from it

Money Supply

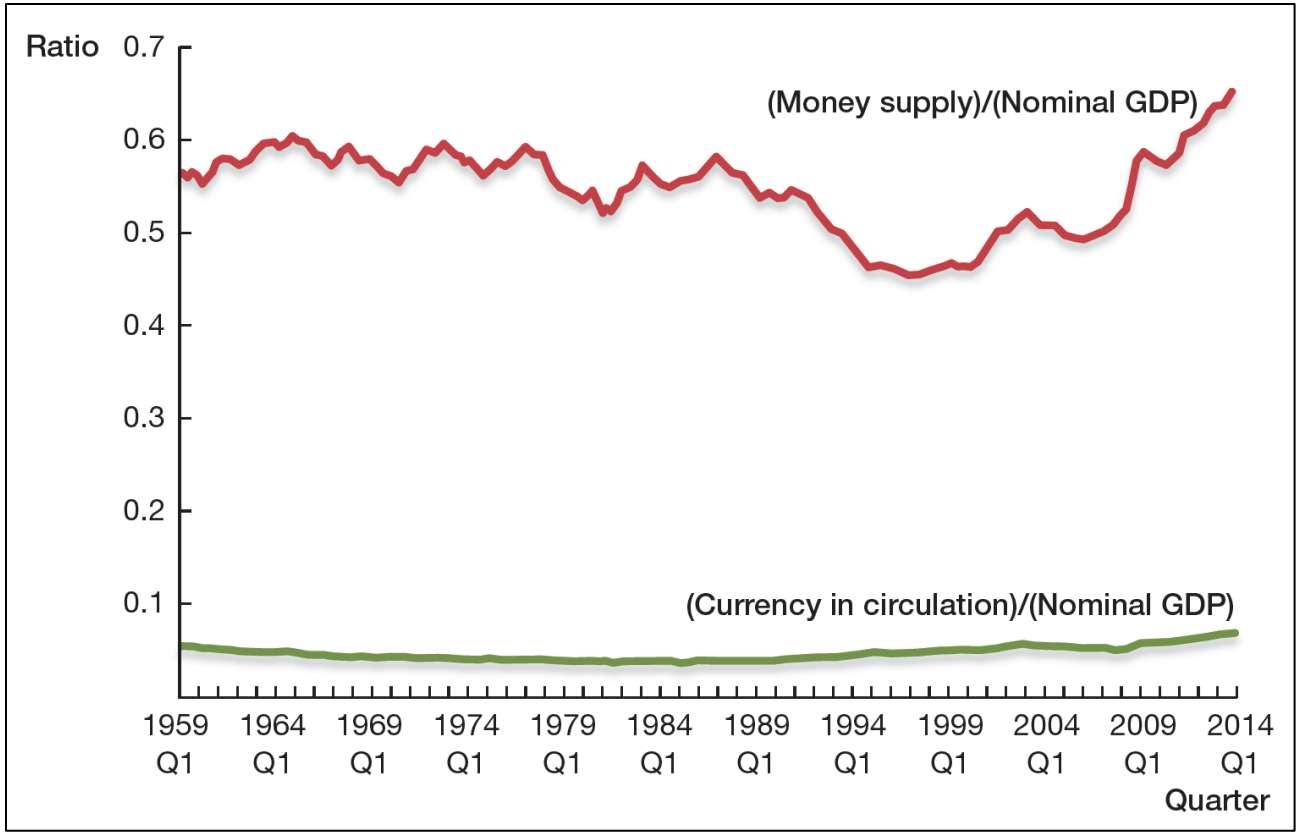
- There are different measures of money supply, exact classification depends on the country.
- The money supply M2 is the sum of currency in circulation, checking accounts, savings accounts, and most other types of bank accounts.

  (there are others: M1 and M3)

Money Supply M2



Money Supply



M2 is about 9 times the magnitude of currency in circulation. What do you buy with cash?

Quantity Theory of Money: Money Growth and Inflation

Let's remember a few definitions from Handout 2:

- *Nominal GDP* is the total value of production (final goods and services), using the prices from the same year the output was produced.

- *Real GDP* is the total value of production (final goods and services), using fixed prices taken from a particular base year (which may or may not be the year the output was produced).

Consider the Island of Dr. Jay, which produces only basketballs.

Calculate nominal and real GDP for the base year of 2022:

Year	Basketballs		Nominal GDP	Real GDP
	Number	Price		
2022	20	$40		
2023				

Suppose that nominal GDP increases to $1,000 in 2023, but the source of the increase is unknown:

Year	Basketballs		Nominal GDP	Real GDP
	Number	Price		
2022	20	$40	$800	$800
2023	??	??	$1,000	??

We will consider two possible scenarios.

Scenario A:

Year	Basketballs		Nominal GDP	Real GDP
	Number	Price		
2022	20	$40	$800	$800
2023	25	$40	$1,000	

Calculate the *level* of real GDP in 2023.

Scenario A:

Year	Basketballs		Nominal GDP	Real GDP
	Number	Price		
2022	20	$40	$800	$800
2023	25	$40	$1,000	$1,000

The *growth rate* of real GDP is 25%

The *growth rate* of prices is 0

Scenario B:

Year	Basketballs		Nominal GDP	Real GDP
	Number	Price		
2022	20	$40	$800	$800
2023	20	$50	$1,000	

Calculate the *level* of real GDP in 2023.

Scenario B:

Year	Basketballs		Nominal GDP	Real GDP
	Number	Price		
2022	20	$40	$800	$800
2023	20	$50	$1,000	$800

The *growth rate* of real GDP is 0

The *growth rate* of prices is 25%

Here is a summary of our results:

Scenario	Growth Rate of Nominal GDP	Growth Rate of Real GDP	Growth Rate of Prices
A	25%	25%	0%
B	25%	0%	25%

Under each scenario, we found that:

Growth rate of nominal GDP = Growth rate of real GDP + Growth rate of prices

Growth rate of nominal GDP = Growth rate of real GDP + Inflation rate

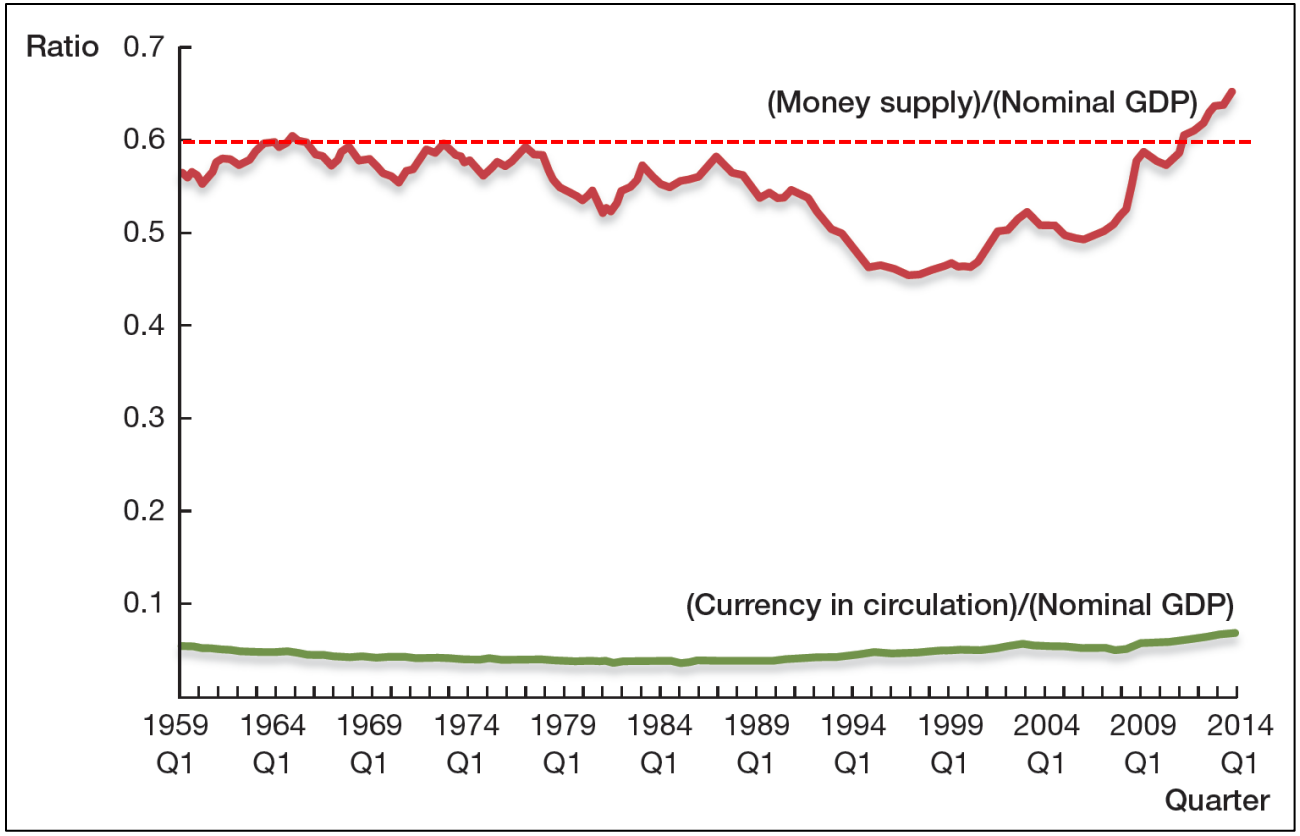
Quantity Theory of Money

The quantity theory of money assumes that the ratio of money to GDP is constant:

$$\frac{\text{Money Supply}}{\text{Nominal GDP}} = \text{constant}$$

A constant ratio is a good approximation of how an economy behaves in the **long run**.
(as shown in the figure before)

Quantity Theory of Money



Quantity Theory of Money

A constant ratio implies that money and nominal GDP must grow at the same rate:

Growth rate of money supply = Growth rate of nominal GDP

Using our previous relationship, we get:

Growth rate of money supply = Inflation rate + Growth rate of real GDP

Quantity Theory of Money

Rearranging terms, the **quantity theory** predicts the rate of inflation:

Inflation rate = Growth rate of money supply – Growth rate of real GDP

"…**inflation is always and everywhere a monetary phenomenon** in the sense that it can be produced only by a more rapid increase in the quantity of money than in output"

Milton Friedman, 1994

Inflation: some distinctions

Inflation

A situation of rising prices.

Hyperinflation

A situation of extreme inflation where prices double within three years.

Deflation

A situation of falling prices (negative inflation).

Disinflation

A situation when prices grow at a slower pace than before.

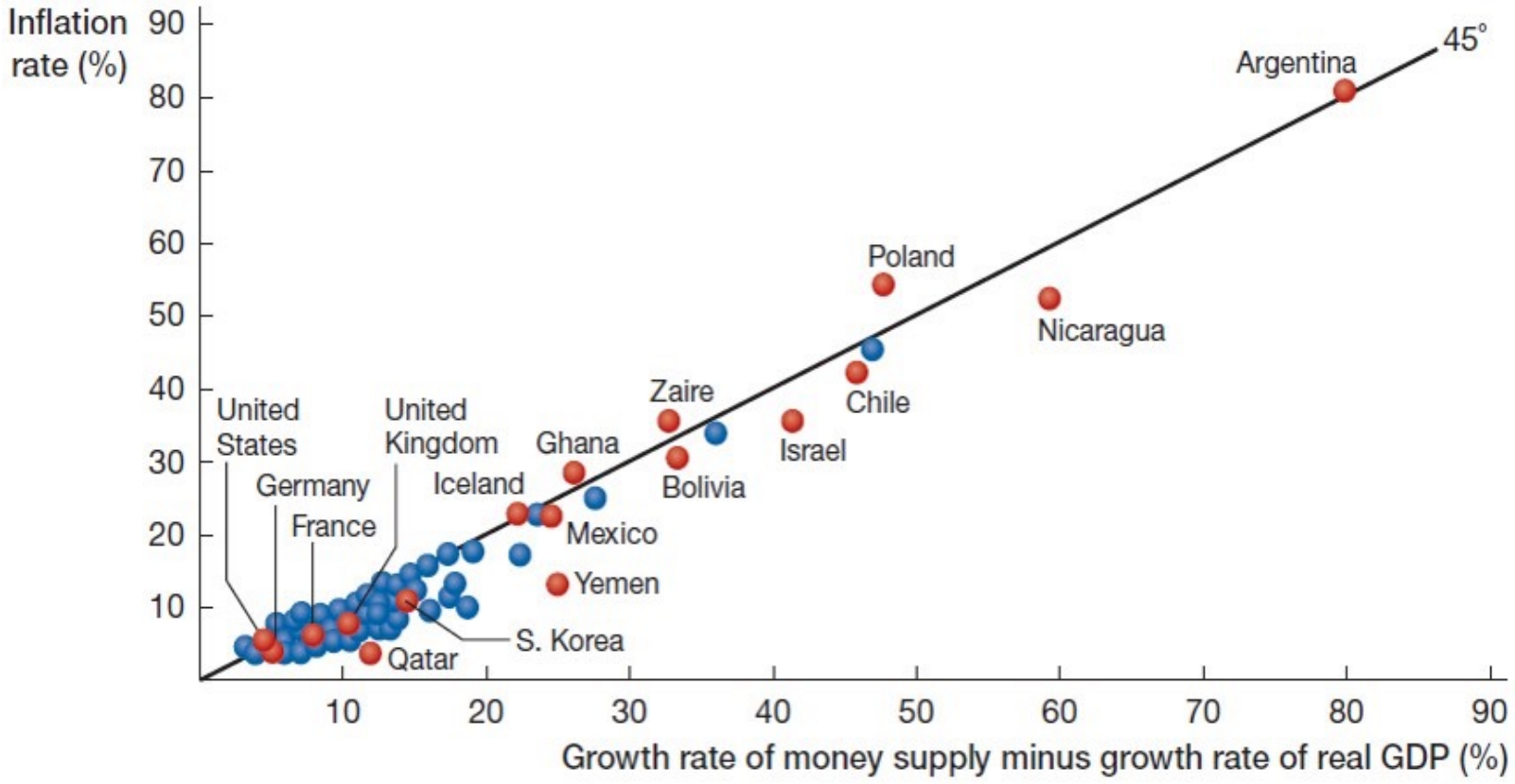
Question: What causes inflation?

Data: Average money growth and inflation rates for 2000–2010 for 179 countries (World Development Indicators).

Prediction: Inflation rate = Growth rate of money supply – 3%

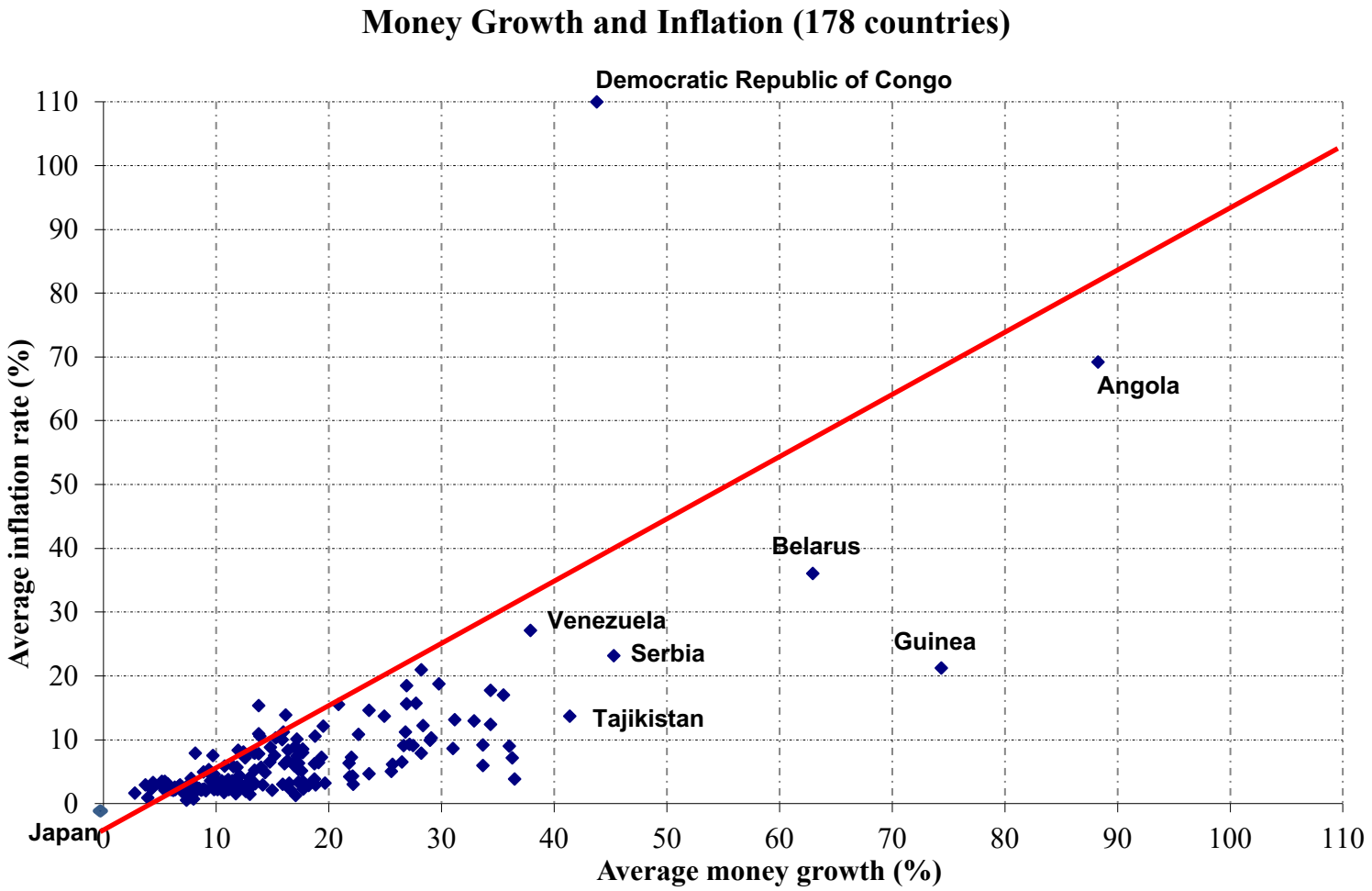
Money, Prices, and GDP (1960-90)

Testing the Long-Run Prediction of the Quantity Theory of Money



Note: data from 110 countries

Inflation and money growth, 2000-2010



Inflation

- Under inflation, all prices and all wages do *not* always move together.
- Under inflation, some **relative prices**, including the real wage and real interest rate, can change.
- This creates winners who benefit from unexpected gains and losers who suffer from unexpected losses.

Distributional Effect of Inflation

Who wins and who loses from unexpected inflation?

Winners:

1. A homeowner paying a mortgage at a fixed rate of interest
2. The owners of a firm (shareholders) paying a pension that is not indexed for inflation

Distributional Effect of Inflation

Losers:

1. A bank receiving payments on a mortgage at a fixed rate of interest
2. A retiree receiving a pension that is not indexed for inflation

This give a rationale why various contracts are indexed to inflation

Social Costs of Inflation

Inflation imposes social costs due to:

1. Raising logistical costs, menu costs
2. Distorting relative prices when changes in price do not happen at the same time
3. Inflation can lead to counterproductive policies such as price controls.

Social Benefits Inflation

Inflation generates social benefits such as:

1. Generating government revenue from printing currency – **seignorage**
2. Sometimes stimulating economic activity – eg if labour contract is signed in terms of fixed nominal term for a fixed duration

- Provide some rationale why many central banks such as Bank of England targets inflation at 2%

Evidence-Based Economics Example:

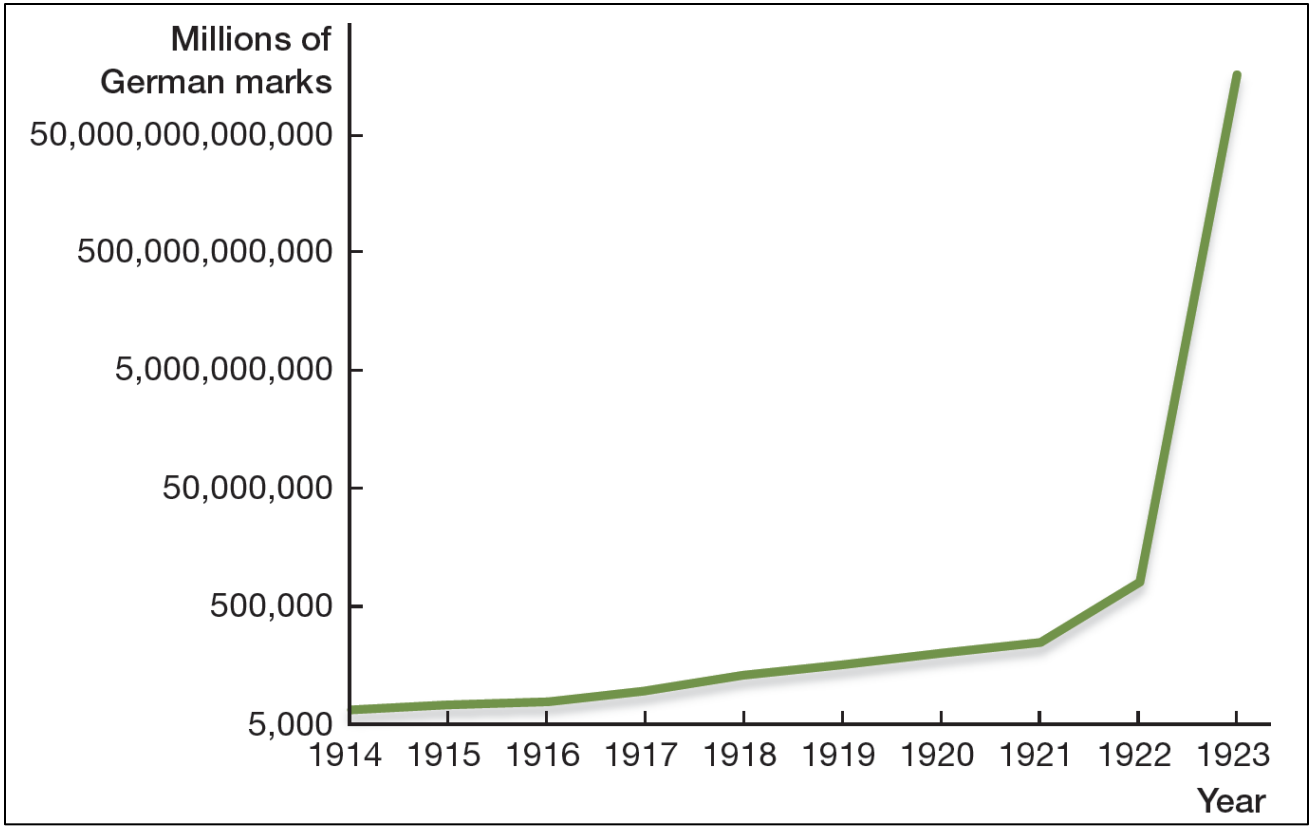
Question: What caused the German hyperinflation of 1922–1923?

Data: Historical money supply data.

Example: German Hyperinflation 1922-1923

- Hyperinflation: a loaf of bread: 250 marks in January 1923, increased to 200,000 million marks by November.
- The German government could not make reparation payments to the Allies after World War I. As the German economy struggled, the government started to print more and more currency to pay its bills.

Example: German Hyperinflation 1922-1923, Currency in circulation



German currency in circulation exploded from 1922-23.