

EC132.02

Principles of Macroeconomics

Boston College

Tuesday, April 23

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Announcements and Reminders

Aplia homework on the remainder of Ch 29, The Monetary System, due this Friday, April 26, at 9am.

Aplia homework on the first part of Ch 30, The Classical Theory of Inflation, due next Thursday, May 2, at 9am.

Today: Ch 30 Money Growth and Inflation (but only the first section, on the Classical Theory of Inflation)

Finally: Ch 33 Aggregate Supply and Aggregate Demand

Example 2: A Solvency Crisis

Now let's go back to the beginning:

First National Bank	
Assets	Liabilities
Reserves \$10	Deposits \$100
Loans \$90	Shareholders' Equity \$10
Other Assets \$10	

Example 2: A Solvency Crisis

But now suppose that \$50 of the bank's loans go bad: the borrowers go bankrupt and can't repay.

Now the bank must write off the value of these bad loans:

First National Bank	
Assets	Liabilities
Reserves \$10	Deposits \$100
Loans \$40	Shareholders' Equity -\$40
Other Assets \$10	

Even if the bank could sell off all of its remaining assets, it cannot repay what it, in turn, owes to its depositors.

Shareholder's equity is wiped out, and the bank is **insolvent** or bankrupt.

Example 2: A Solvency Crisis

What can be done now?

The government could pay off depositors from the FDIC insurance fund and recoup at least some of the money by selling off the bank's remaining assets.

Essentially, this was how the savings and loan crisis of the 1990s was resolved.

Example 2: A Solvency Crisis

Or the government could use taxpayer funds to recapitalize the bank.

For example, the government could agree to buy newly-issued equity shares for \$50 while at the same time wiping out the original owners' equity stake.

Example 2: A Solvency Crisis

First National Bank – Before Recapitalization	
Assets	Liabilities
Reserves \$10	Deposits \$100
Loans \$40	Private Shareholders' Equity -\$40
Other Assets \$10	

First National Bank – Just After Recapitalization	
Assets	Liabilities
Reserves \$60	Deposits \$100
Loans \$40	Private Shareholders' Equity \$0
Other Assets \$10	Government's Equity \$10

Example 2: A Solvency Crisis

First National Bank – Just After Recapitalization	
Assets	Liabilities
Reserves \$60	Deposits \$100
Loans \$40	Private Shareholders' Equity \$0
Other Assets \$10	Government's Equity \$10

First National Bank – After Recapitalization and Making New Loans	
Assets	Liabilities
Reserves \$10	Deposits \$100
Loans \$90	Private Shareholders' Equity \$0
Other Assets \$10	Government's Equity \$10

Example 2: A Solvency Crisis

First National Bank – After Recapitalization and Making New Loans	
Assets	Liabilities
Reserves \$10	Deposits \$100
Loans \$90	Private Shareholders' Equity \$0
Other Assets \$10	Government's Equity \$10

The bank's balance sheet looks the same as it did before the crisis.

Except now the bank is owned by the US Government.

Banking and Financial Crises

The recent financial crisis had elements of both a liquidity crisis and a solvency crisis.

How much was just bad luck – a liquidity crisis brought about by a run on nonbank institutions that could have pulled through if they had gotten access to the discount window sooner ...

... and how much was bad management – a solvency crisis brought about by financial institutions making unwise loans that, predictably, went bad ...

... is still not clear and may never be known for sure.

Banking and Financial Crises

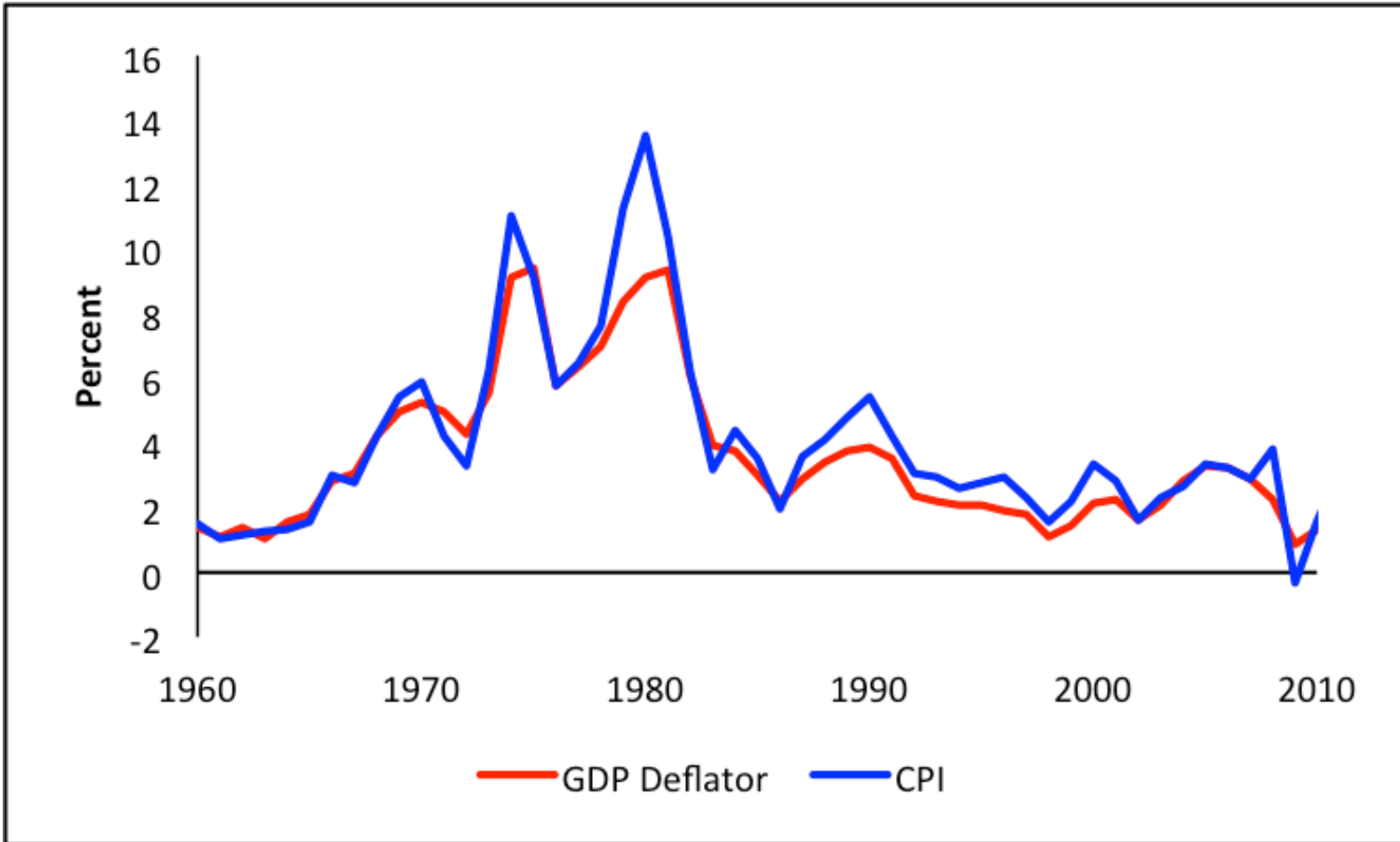
But regardless of who or what was to blame, our analysis of a fractional reserve banking system explains why the policy responses involved:

1. Expanding access to the Fed's discount window to nonbank financial institutions.
2. Expanding federal deposit insurance programs to other types of very short-term debt.
3. Some way of either closing down (liquidating) or recapitalizing insolvent banks and nonbank financial institutions.

Banking and Financial Crises

An excellent and much more detailed analysis of liquidity and, especially, solvency problems in the US financial system during 2008 is presented by Anat Admati and Martin Hellwig in their very recent book *The Bankers' New Clothes: What's Wrong with Banking and What to Do About It*.

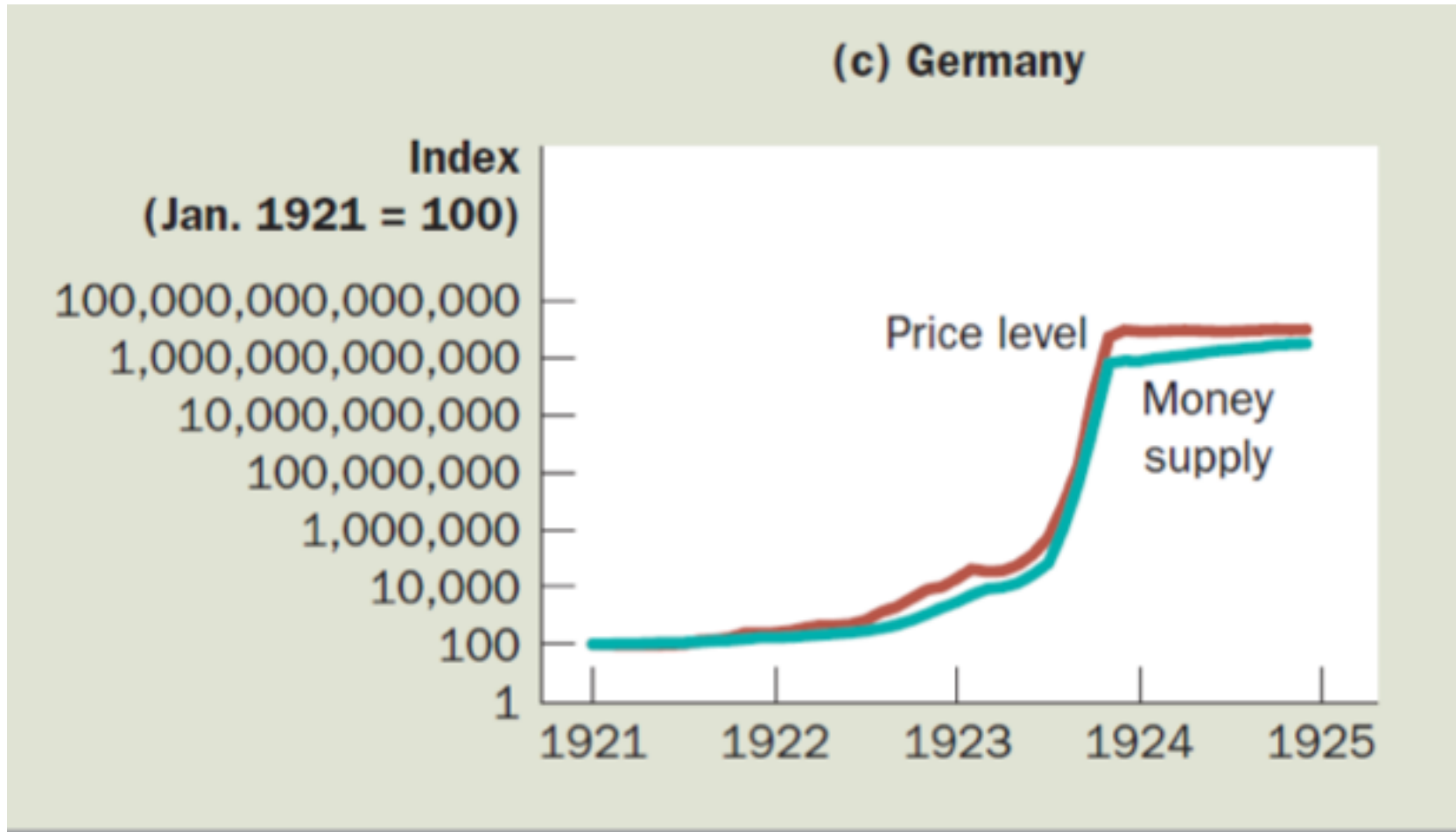
The GDP Deflator and the CPI



The Classical Theory of Inflation

The **classical theory of inflation** is also referred to as the **quantity theory of money**, since it identifies an excessive increase in the quantity of money as the principal cause of inflation.

German Hyperinflation, 1921-24



The Level of Prices and the Value of Money

Why does an ice cream cone cost so much more today than it did in the 1930s?

Is it because ice cream cones are so much better and therefore more valuable today?

More likely, it is that dollars have become less valuable.

The Level of Prices and the Value of Money

P = price level (CPI or GDP Deflator)

P = number of dollars needed to purchase a basket of goods

$$P = \frac{\text{dollars}}{\text{basket of goods}}$$

The Level of Prices and the Value of Money

P = number of dollars needed to purchase a basket of goods

$$P = \frac{\text{dollars}}{\text{basket of goods}}$$

$$\frac{1}{P} = \frac{\text{basket of goods}}{\text{dollars}}$$

$1/P$ = number of baskets of goods needed to “purchase” a dollar

The Level of Prices and the Value of Money

P is the “dollar price of goods”

$1/P$ is the “goods price of money”

Inflation – a rise in P – represents a decline in the value of money.

Money Supply and Money Demand

With this insight – that $1/P$ measures the goods price of money or more simply “the price of money” – we can apply microeconomic supply-and-demand analysis to the “market” for money.

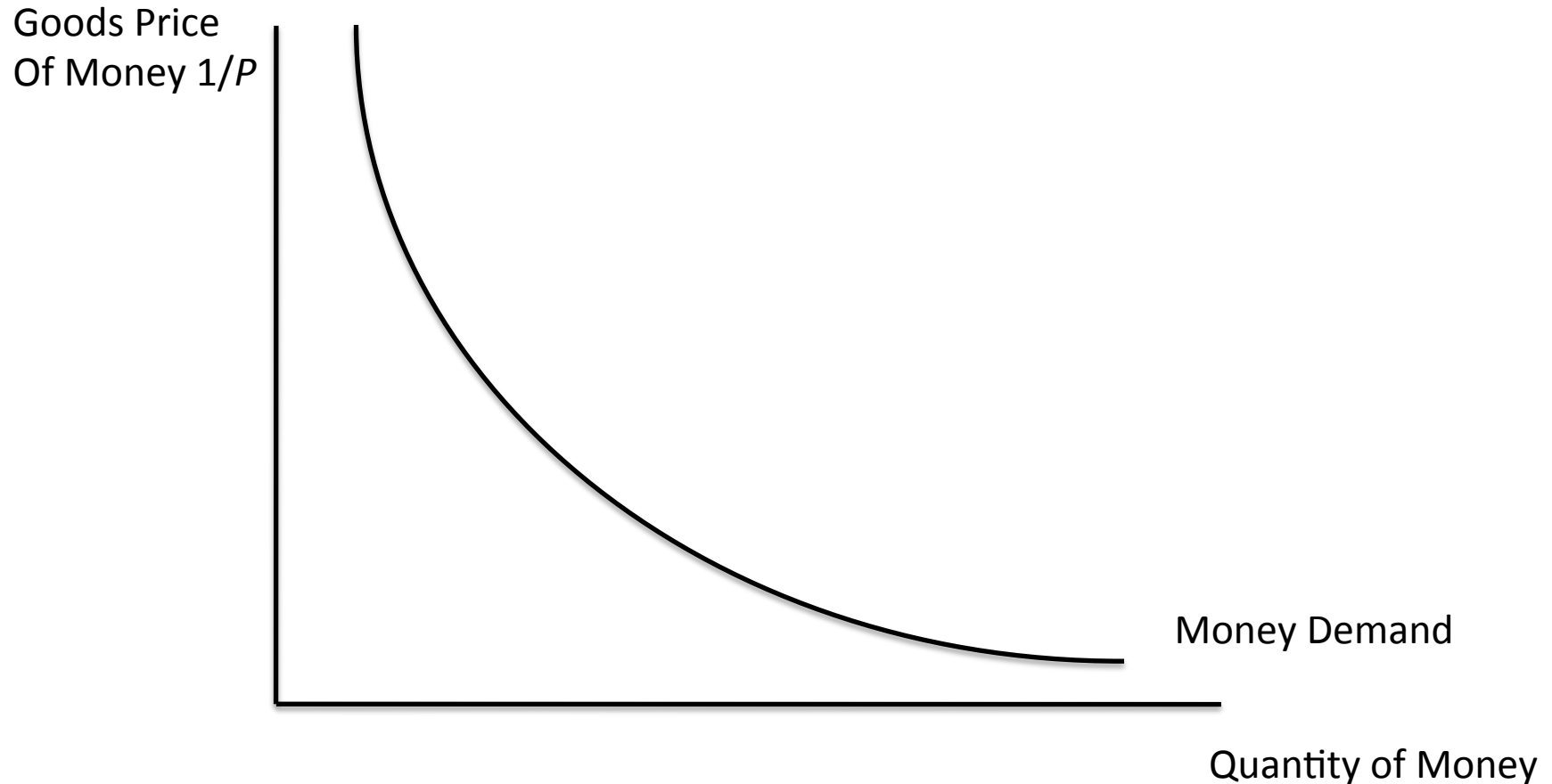
Money Supply and Money Demand

Goods Price
Of Money $1/P$



Quantity of Money

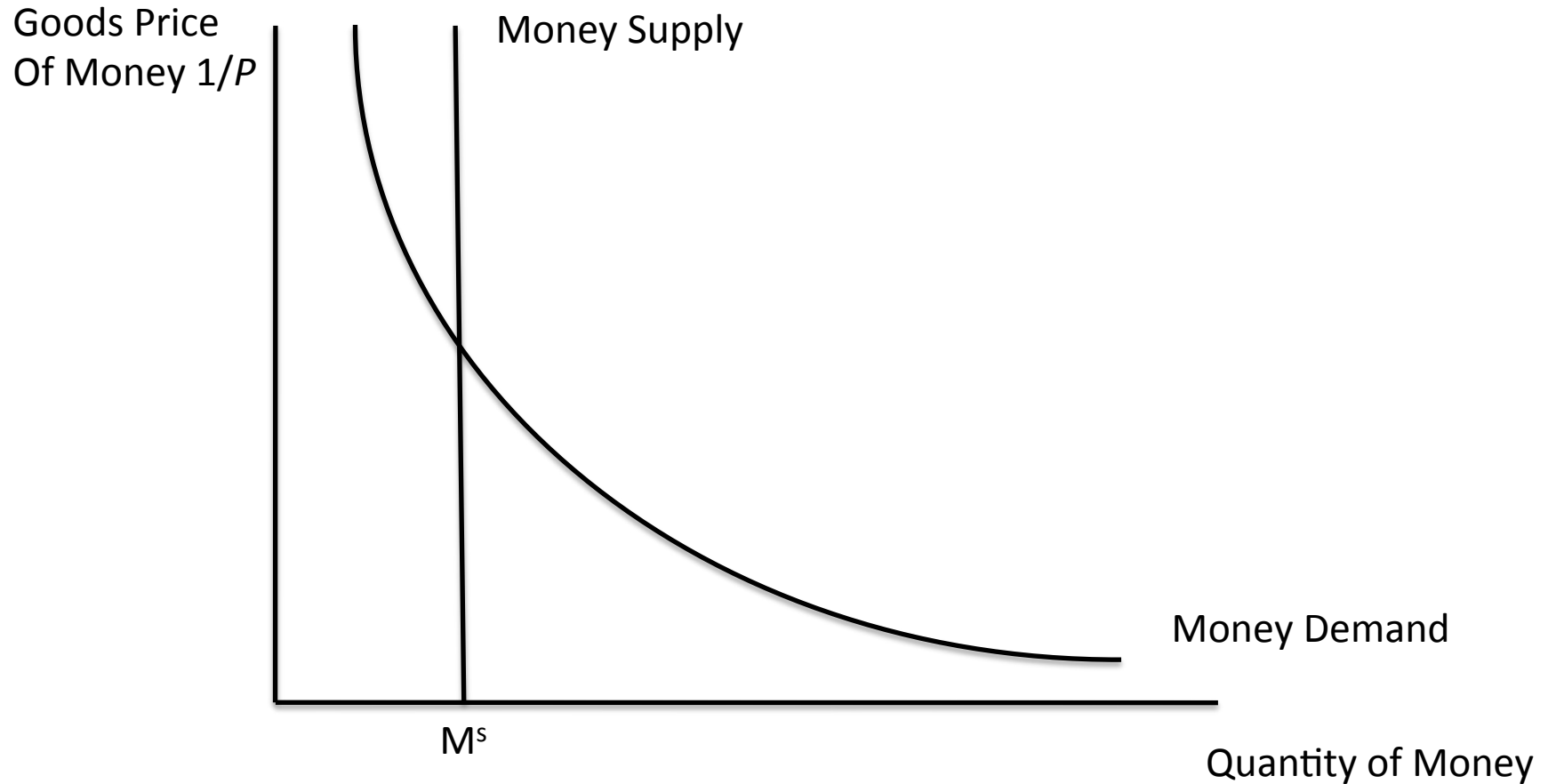
Money Supply and Money Demand



The money demand curve slopes down because:

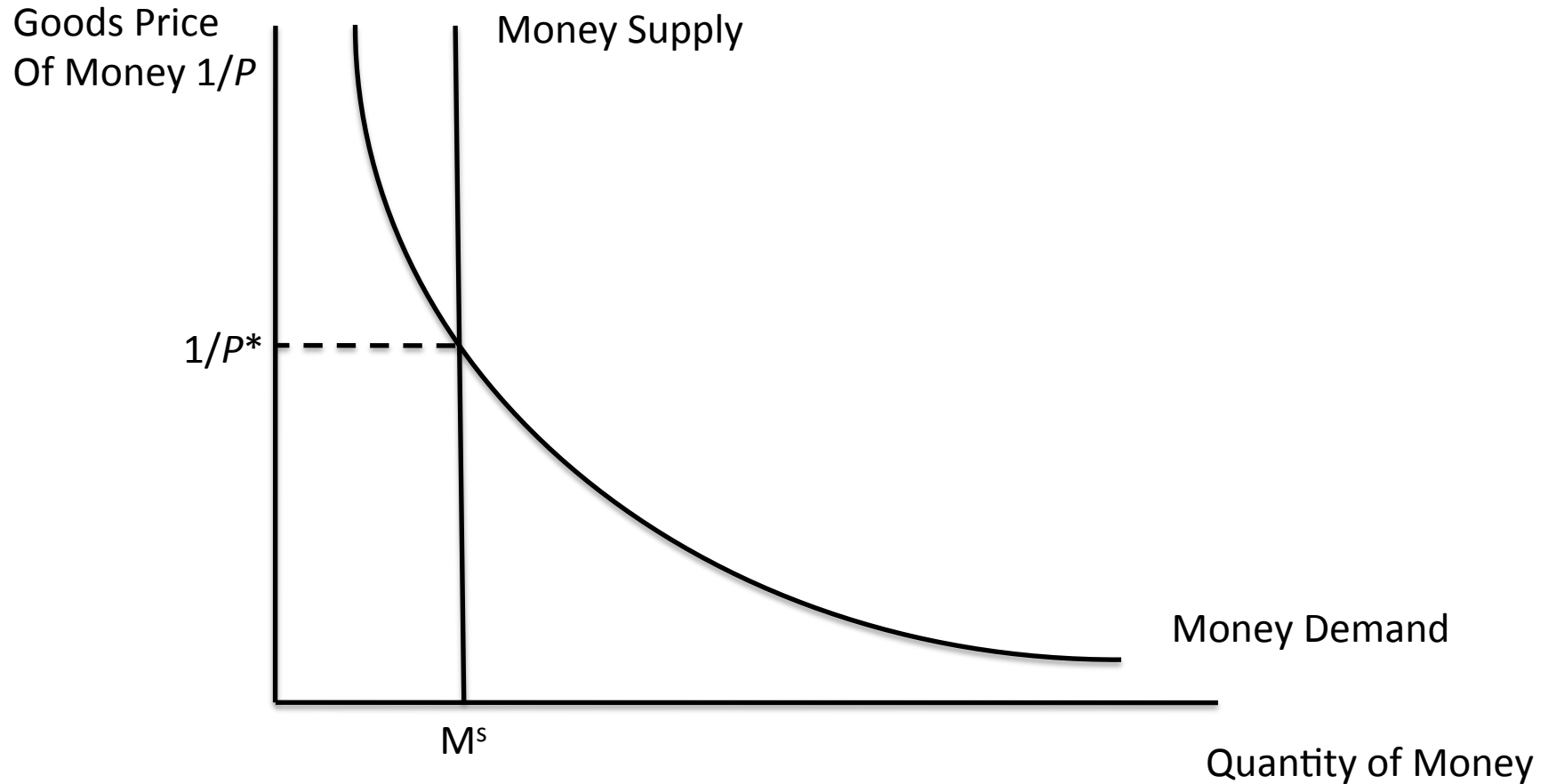
- 1) When the price of money falls, the demand for money rises.
- 2) When goods prices rise, people need more money to buy the same number of goods.

Money Supply and Money Demand



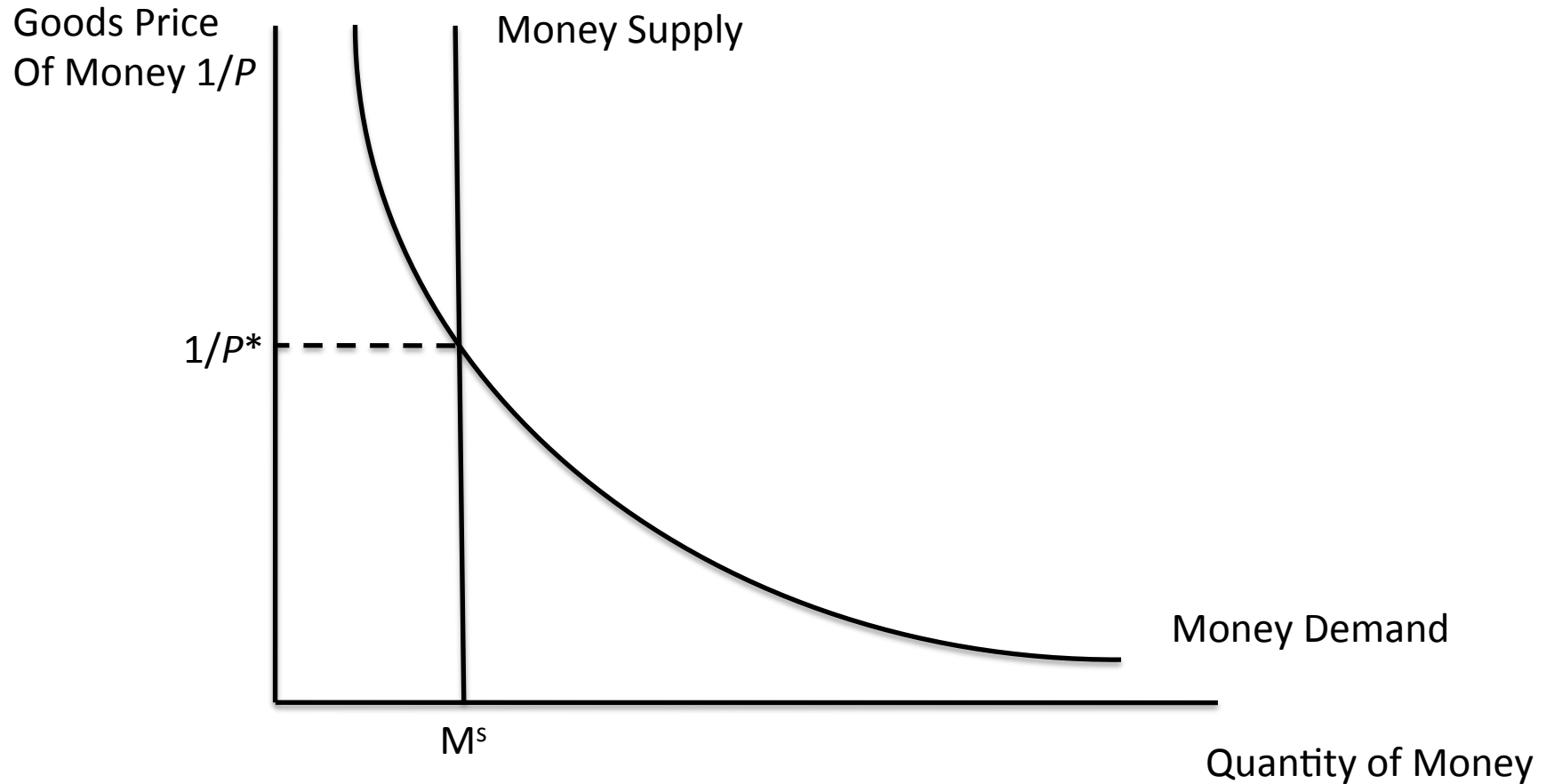
The money supply curve is vertical when the Fed decides what it wants the money supply to be and conducts open market operations to bring about that level M^s for the money supply.

Money Supply and Money Demand



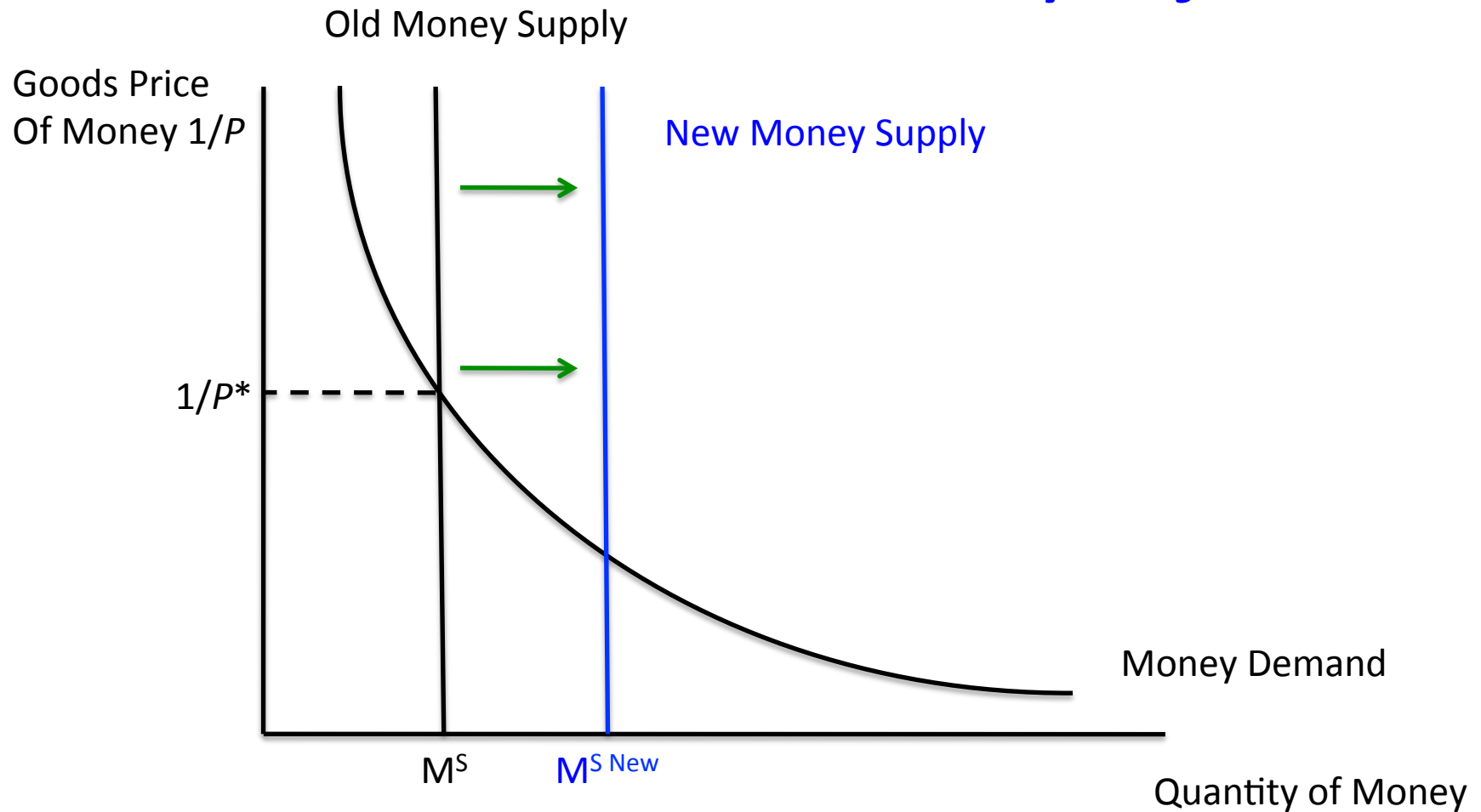
The equilibrium goods price of money, $1/P^*$, is the price that equates demand and supply.

Money Supply and Money Demand



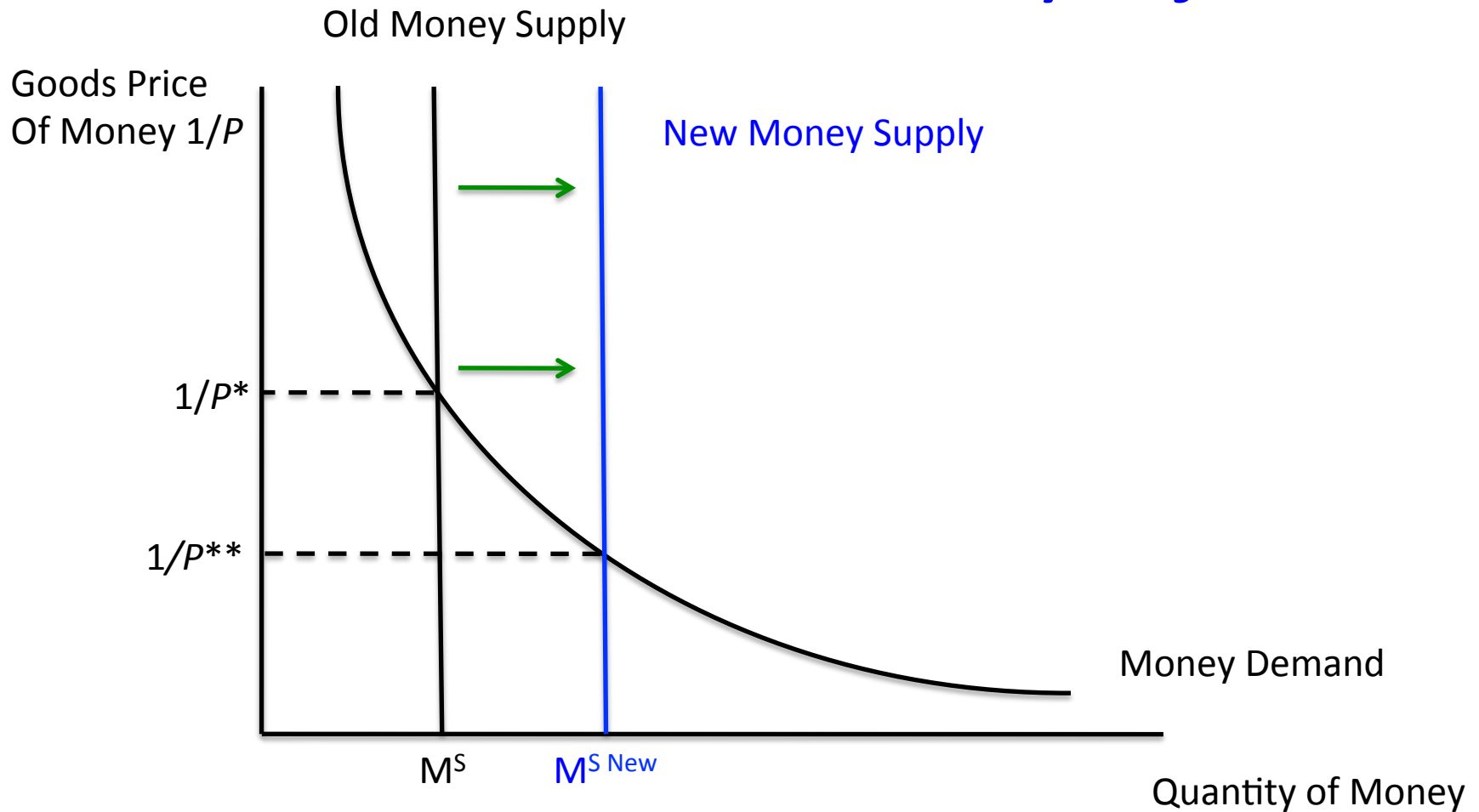
The equilibrium goods price of money, $1/P^*$, is the price that equates demand and supply.
But once $1/P^*$ is determined, so is P^* , the dollar price of goods.

The Effects of a Monetary Injection



Now suppose the Fed conducts an open market operation that increases the money supply from M^S to $M^{S \text{ New}}$.

The Effects of a Monetary Injection



When the Fed increases the money supply:

- 1) The goods price of money falls.
- 2) But the dollar price of goods rises.

The Effects of a Monetary Injection

When the Fed increases the money supply, the dollar price of goods rises.

Hence, inflation – a rising price level – is associated with a policy of money creation.

This **quantity theory of money** implies that the Fed can choose whatever inflation rate it thinks is best, and can then bring about that inflation rate through a policy that leads to the associated rate of money growth.

The Classical Dichotomy and Monetary Neutrality

The **quantity theory of money** implies that changes in the money supply affect the price level, inflation, and other **nominal** variables.

The theory of **monetary neutrality** goes a step further, and says that changes in the money supply do **not** affect **real variables**.

The Classical Dichotomy and Monetary Neutrality

David Hume's thought experiment:

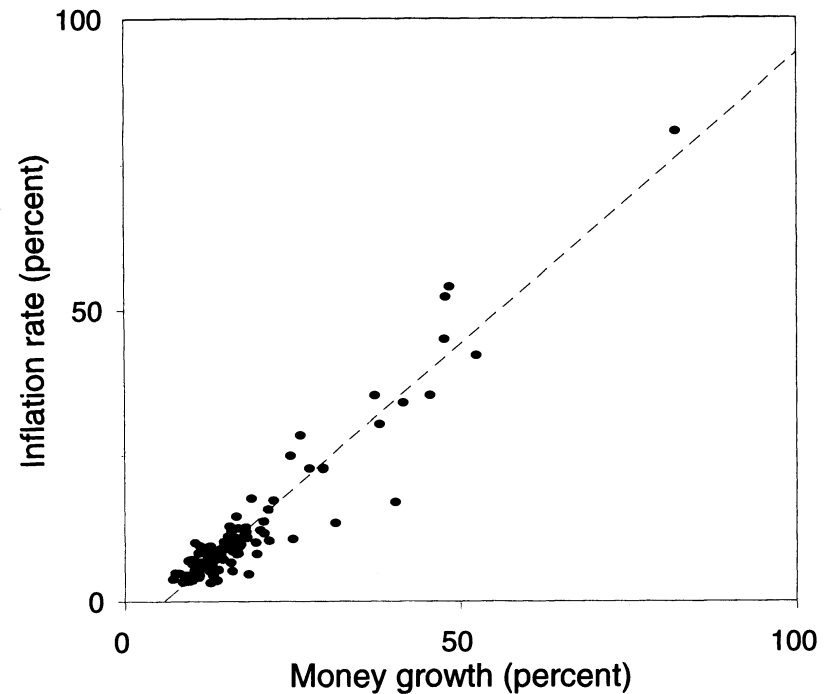
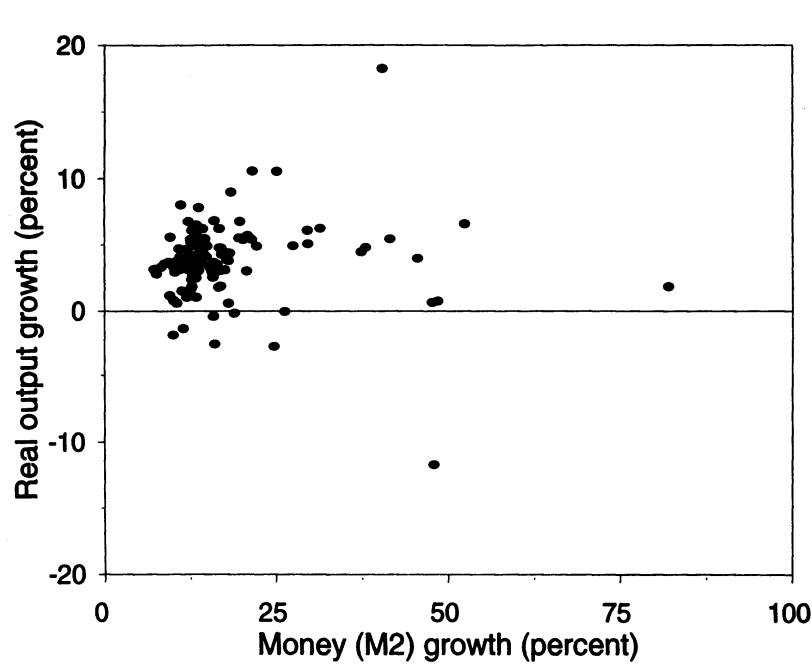
Suppose the money supply doubles, from \$100 billion to \$200 billion.

Everybody has twice as much money, but the ability to produce goods and services, based on productivity and its determinants, has not changed.

Introspection suggests that the overall price level P should double, leaving output and all other real variables unchanged.

The Classical Dichotomy and Monetary Neutrality

Across 110 countries, average money growth over the period from 1960 to 1990 is uncorrelated with real GDP growth, but highly correlated with inflation.



From: George T. McCandless and Warren E. Weber. "Some Monetary Facts."
Federal Reserve Bank of Minneapolis Quarterly Review, Summer 1995.