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Chapter 14: Money and Banks

Money is one of the most important inventions of mankind.

- Economists consider **money** to be any asset that people are generally willing to accept in exchange for goods and services, or for payment of debts.
- **Asset**: Anything of value owned by a person or a firm.

Suppose you were living before the invention of money. What is life like?

You must barter: Exchange goods for other goods

For trade to occur, a double coincidence of wants is required

- I have X and want Y, You have Y and want X
- I must value Y more than you value your Y.
- You must value X . . . . .

Eventually, societies started using **commodity money**—goods used as money that also have value independent of their use as money

- animal skins, precious metals, or bushels of grain

The existence of money has huge benefits:

- makes trading much easier
- and allows specialization, an important step for developing an economy.

Money fulfills four primary functions:

Medium of exchange

- Money is acceptable to a wide variety of parties as a form of payment for goods and services.

Unit of account

- Money allows a way of measuring value in a standard manner.

Store of value

Money allows people to defer consumption till a later date by storing value. Other assets can do this too, but money does it particularly well. Why?

- because it is liquid, easily exchanged for goods.

Standard of deferred payment

- money facilitates exchanges across time when we anticipate that it will still have future value.

In order to serve as an acceptable medium of exchange (and hence a potential "money"), a good should have the following characteristics:

1. The good must be *acceptable* to most people.
2. It should be of *standardized quality* so any two units are alike.
3. It should be *durable* so that value is not lost by storage.
4. It should be *valuable* relative to its weight, so that it can easily be transported even in large quantities.
5. It should be *divisible* because different goods are valued differently.

Commodity money vs. Fiat money

Commodity money has a value independent of its use as money.
Some important historical and modern commodity moneys:

- Cowrie shells in Asia
- Precious metals, such as gold or silver
- Beaver pelts in pre-colonial America
- Cigarettes in prisons and prisoner-of-war camps

- In other words, you could use the money directly as an input or consume it.

Beginning in China in the 10th century and spreading throughout the world, *paper money* was issued by banks and governments.

- The paper money was exchangeable for some commodity, typically gold, on demand.

In modern economies, paper money is generally

- issued by a central bank or by the government.

The **Federal Reserve** is the central bank of the United States. However, money issued by the Federal Reserve is no longer exchangeable for gold; nor is *any* current world currency. Instead, the Fed issues currency known as **fiat money**.

Fiat money refers to any money, such as paper currency, that is authorized by a central bank or governmental body, and that does not have to be exchanged by the central bank for gold or some other commodity money.

- Has no intrinsic value. Literally just a piece of paper with a dead president's picture on it.

Fiat money has the advantage that governments do not have to be willing to exchange it for gold or some other commodity on demand.

- This makes central banks more flexible in creating money.

However, it also creates a potential problem: fiat money is only acceptable as long as households and firms have confidence that if they accept paper dollars in exchange for goods and services, the dollars will not lose much value during the time they hold them.

- If people stop "believing" in the fiat money, it will cease to be useful.

How much money is there in America?

This is harder to answer than it first appears, because you have to decide what to count as "money".

M1 is the narrowest definition of the money supply:

- the sum of
  - currency in circulation
  - checking account and savings account deposits in banks.
  - holdings of traveler's checks (tiny).

There is a relatively large amount of U.S. currency, because people in other countries sometimes hold and use U.S. dollars instead of their own currency.

M2 is a broader definition of the money supply:

- small - denomination time deposits
- money - market accounts
- non - institutional money market fundshares.

Note: Savings accounts used to be only part of M2, and not part of M1. In May 2020, money supply definitions were changed to include savings accounts as M1.

- This was done because savings account have become more liquid.

When we want to talk about the money supply, which definition should we use?

Either one might be valid, but we are mostly interested in money's role as the medium of exchange, so this suggests using M1.

In our discussion of money, we will:

1. Treat both currency, checking accounts, and savings accounts as "money",
   but nothing else
2. Realize that banks play an important role in the money supply
   since they control what happens to money when it is in a checking or savings account.

What about credit and debit cards?

Debit cards directly access checking accounts, but the *card* is not money, the checking account balance is.

Credit cards are a convenient way to obtain a short-term loan from the bank issuing the card. But transactions are not really complete until you pay the loan off—transferring money to pay off the credit card loan.

- So credit cards do <u>not</u> represent money.

What about PayPal and Bitcoins?

When we think of money, we typically think of currency issued by a government.

- But currency is only a small part of the money supply.

Over the last decade or so, consumers have come to trust forms of e-money such as PayPal.

Bitcoins are a new form of e-money, owned not by a government or firm, but a product of a decentralized system of linked computers.

- Bitcoins can be traded for other currencies on web sites.
- Some web sites accept Bitcoins as a form of payment.

Should Bitcoins be included in a measure of the money supply?

- For now, they are not;
- if they grow popular, maybe they should be.

How do Banks Create Money?

Banks play a critical role in the money supply.

- Recall **that** there is more money held in checking accounts than there is actual currency in the economy.

- So somehow money is being created by banks.
- This does NOT mean banks are printing money.

Further, banks are generally profit-making private firms: some small, but some among the largest corporations in the country.

- Their activities are designed to allow themselves to make a profit.

In order to understand the role that banks play, we will first try to understand how banks operate as a business.

Reserves are deposits that a bank keeps as cash in its vault or on deposit with the Federal Reserve.

Notice that the bank does not keep enough deposits on hand to cover all of its deposits.

- This is how the bank makes a profit: lending out or investing money deposited with it.

Bank reserves are <u>NOT</u> part of the money supply since they are funds that are not in active circulation.

Bank reserves are actually part of something called the **monetary base**. The monetary base includes physical currency and bank reserves. Currency in circulation is part of M1 (and therefore the money supply as we defined it), but reserves and vault cash at banks are not part of M1.

Importantly, we will see that banks can influence the money supply by lending. When banks take their reserves and loan it individuals or firms,

- The money supply is increased.

Printing and Minting Money

The Bureau of Engraving and Printing (BEP) is a government agency within the United States Department of the Treasury that designs and produces

- Federal Reserve Notes (physical bills, fiat money)

It has two locations in Washington, D.C. and Forth Worth, Texas. The D.C. location will move to Beltsville Maryland in a few years.

Coins, on the other hand, are made at the US Mint. There are four facilities, the largest in Philadelphia. Other locations are San Francisco, Denver, and West Point, New York.

The printing and minting of money generates profits for the government, and those profits are used to fund the BEP and Mint.

Seigniorage:

- Difference between the cost of making currency and the face value of the currency.

Examples:

- costs 9.4 cents to make a $100 bill
- costs 6 cents to make a $20 bill
- Negative Seigniorage: costs more than a penny to make a penny.

Numismatic profits: Selling currency as collector's item for more than production cost and often more than face value.

Examples:

- 50 state quarter set cost $2.50 to make, had $12.50 face value, and were sold by the mint for $14.
- Mint made $110 million in profits from this.

Example of a failure:

- US dollar coins.

The bank must keep *some* cash available for its depositors; it does this through a combination of *vault cash* and deposits with the Federal Reserve.

This system is called

Fractional reserve banking

The reason for this system is to allow lending to happen more easily, which can create economic growth.

Banks in the U.S. are required to hold **required reserves**: reserves that a bank is legally required to hold, based on its checking account deposits.

- At least 10% of checking account deposits above some threshold level ($71.0 million in 2012, $124.2 million in 2019).

That 10% was known as the required reserve ratio.

However,

- Banks could choose to hold excess reserves.
- (reserves over the legal requirement)

In March 2020, the Fed eliminated reserve requirements. in an effort to make sure banks could lend money wherever was needed.

As of this writing

- The required reserve ratio is still 0%!!!

The $900 loaned money originally showed up as a deposit in someone's Bank of America checking account, but it quickly gets spent. The borrower spent the money on new landscaping, paid the landscaper, and the landscaper deposited the money into his bank account at PNC Bank.

So with the $1,000 deposit, the T accounts really look like this:

Bank of America					PNC Bank			
Assets		Liabilities			Assets		Liabilities	
Reserves	+$100	Deposits	+$1,000		Reserves	+$900	Deposits	+$900
Loans	+$900							

Now, there are $1,900 in deposits. M1 increased!

But then PNC bank has $900 in reserves.

But PNC will ~~bank~~ want to loan out some of that $900

The process repeats, where PNC loans out money, those funds could get deposited into another bank, which would then lend out those funds, and so on, and so on.

So the original deposit of $1,000 turns into total deposits of more than $1,000 throughout the banking system.

This multiple expansion of deposits illustrates the concept of the **money multiplier**.

The money multiplier is:

$$\text{Money multiplier} = \frac{\text{Money Supply}}{\text{Monetary Base}}$$

Remember the monetary base is the sum of currency in circulation plus **bank reserves**.

Money supply is just the M1 money supply.

To get the intuition of this equation, you could also rewrite it as:

$$(\text{monetary base}) \times (\text{money multiplier}) = \text{money supply}$$

If we assume the monetary base is constant, we can examine the current money supply to see the multiplier.

In other words, we see that the monetary base gets multiplied by some amount to create the money supply.

The money multiplier fluctuates quite a lot, and depends on two key factors.

1. The amount of reserves banks hold

If banks hold fewer reserves relative to their deposits and are making more loans, more new deposits will be created from those loans and the money multiplier will be larger.

If banks choose to hold more reserves, the money multiplier will be smaller.

2. The amount of currency that households and firms hold relative to their bank deposits.

If firms and households hold more cash (physical currency) instead of depositing money in banks, the money multiplier will be smaller.

If firms and households Hold less cash and deposit more money in banks, the money multiplier will be larger.

Note: during the recession of 2007-2009, research suggests that the real-world multiplier fell to close to 1.

Why did that happen?

High uncertainty / banks didn't lend

also, people held more cash

The Money Multiplier Today

Since October 2008, the Fed has paid banks interest on their reserves. Thus, banks didn't have the incentive to loan out every penny they have, they can store it and receive interest payments from the Fed. This interest rate is called the IORB rate (Interest on Reserve Balances).

If the Fed decides to increase this rate, banks will choose to hold more reserves on hand or at the Fed and make fewer loans, reducing the money multiplier (see the previous page).

So the choice for banks and their liquid assets today is really:

- Loan to borrowers, who pay i rate.
- Save at Fed, get paid Fed's IORB i rate.

If the banks cannot find creditworthy borrowers, they will store more funds with the Fed.

In general, we can assume that the real-world deposit multiplier is greater than 1. So we conclude that:

1. When banks gain reserves, they make new loans, and the money supply expands.
2. When banks lose reserves, they reduce their loans, and the money supply contracts.

This is enough to establish the important relationship between banks and the money supply.

The Quantity Theory of Money

In the 16th century, Spain sent gold and silver from Mexico and Peru back to Europe.

- These metals were minted into coins, increasing the money supply.

Prices in Europe rose steadily during those years.

This event helped people notice the relationship between money supply & price levels.

In the early 20th century, Irving Fisher formalized the relationship between money and prices as *the quantity equation*:

$$M \cdot V = P \cdot Y$$

M: money supply

V: velocity of money: the avg no. of times each $ gets spent.

P: price level

Y: real GDP (real output)

Intuitively, this equation just says that

Nominal spending = Nominal GDP

We can always calculate V by doing some simple division:

$$V = \frac{P \cdot Y}{M}$$

But will we always get the same answer? The quantity theory of money asserts that, subject to measurement error, we will.

Quantity theory of money: A theory about the connection between money and prices that assumes that the velocity of money is constant.

M; inflation

Theory: Could be true or false

But, a lot of evidence supports this!

Mathematically, when variables are multiplied together in an equation, we can form the same equation with their *growth rates added together*.

↳ %Δ

So the quantity equation:

$$M \times V = P \times Y$$

generates:

↳ $\%\Delta M + \%\Delta V = \%\Delta P + \%\Delta Y$

$\%\Delta V = 0$

Rearranging this to make the inflation rate the subject, and assuming that the velocity of money is constant, we obtain:

inflation rate (%ΔP) = Growth rate in money supply − Growth rate in real output

This equation provides the following predictions:

1. If the money supply grows faster than real GDP, there will be inflation.
2. If the money supply grows slower than real GDP, deflation! (decrease in price level)
3. If the money supply grows at the same rate as real GDP, No %ΔP

Is velocity truly constant from year to year? – probably not.

↳ But, still get valuable insight....

In the long-run, inflation occurs when ☺

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Is velocity truly constant from year to year? – probalely not.

↳ But, still get valuable insight....

In the long-run, inflation occurs when...

Real GDP growth has been relatively consistent over time.

So based on the quantity theory of money (QTM), there should be a predictable, positive relationship between the rates of inflation and growth rates of the money supply.

The real world data shows there *is* a positive relationship, but not the consistent relationship implied by a constant velocity of money.

We see a similar story when we compare average rates of inflation and growth rates of the money supply across different countries.

Although the relationship is not entirely predictable,

- countries with higher growth in the money supply do have higher rates of inflation.

Chapter 15: The Federal Reserve and Monetary Policy

We have described that, in the United States, banks keep less than 100 percent of deposits as reserves. This is known as a **fractional reserve banking system**, and is in a system shared by nearly all countries. But what if depositors lost confidence in a bank, and tried to withdraw their money all at once?

- This is known as a bank run.
- if many banks simultaneously experience bank runs, a bank panic occurs.

A *central bank*, like the Federal Reserve (often just called "The Fed"), can help to prevent bank runs and panics by acting as a *lender of last resort*, promising to make loans to banks in order to pay off depositors.

This assurance helps

- increase confidence in banks, prevent panics

Think of the Fed as

- The bank for banks

In the late 19th and early 20th centuries, the U.S. experienced several bank panics.

- In 1914, the Federal Reserve system started. "The Fed" makes loans to banks called **discount loans**, charging a rate of interest called the **discount rate**.

During the Great Depression of the 1930s, many banks were hit by bank runs. Afraid of encouraging bad banking practices, the Fed refused to make discount loans to many banks, and more than 5,000 banks failed.

- Today, many economists are critical of the Fed's decisions in the early 1930s, believing they made the Great Depression worse.

In 1934, Congress established the Federal Deposit Insurance Corporation (FDIC).

- The FDIC insures deposits in many banks, up to a limit (currently $250,000). This government guarantee has helped to limit bank panics.

Bank runs are still possible; during the recession of 2007-2009, a few banks experienced runs from large depositors whose deposits exceeded the FDIC limit.

- More recently: Silicon Valley Bank April 2023!

In 1913, Congress divided the country into 12 Federal Reserve districts, each of which provides services to banks in the district.
But the real power of the Fed lies in Washington, DC, with the Board of Governors.

- Current chair of the Board of Governors is Jerome Powell.

In addition to being the lender of last resort and acting as a bank for banks, the Federal Reserve is responsible for managing the money supply and conducting monetary policy.

Since World War II, the Fed has played an active role in monetary policy.

Monetary policy: The actions the Federal Reserve takes to

- manage the money supply and interest rates to pursue macroeconomic policy goals.

The Fed pursues four main *monetary policy goals*:

1. Price stability
2. High employment
3. Stability of financial markets and institutions
4. Economic growth

We will examine each of these goals, and then examine the tools the Fed uses to attempt to reach these goals.

Price Stability

Why is price stability important?

- Rising prices erode the value ~~the~~ of money as a medium of exchange and a store of value.

After the high inflation of the 1970s, then Fed chairman Paul Volcker made fighting inflation his top policy goal.

- To this day, price stability remains a key policy goal of the Fed.

High Employment

At the end of World War II, Congress passed the Employment Act of 1946, which stated that it was the:

"responsibility of the Federal government... to foster and promote... conditions under which there will be afforded useful employment, for those able, willing, and seeking to work, and to promote maximum employment, production, and purchasing power."

- Price stability and high employment are often referred to as the <u>dual</u> <u>mandate</u> of the Fed

Stability of Financial Markets and Institutions

Stable and efficient financial markets are essential to a growing economy.

The Fed makes funds available to banks in times of crisis. Why?

- Helps ensure confidence in banks

In 2008, the Fed temporarily made these *discount loans* available to investment banks also, in order to ease their *liquidity* problems.

Economic Growth

Stable economic growth encourages long-run investment, necessary for growth.

- It is not clear to what extent the Fed can really encourage long-run investment, beyond meeting the previous three goals.
- Congress and the President may be in a better position to address this goal.

The **Federal Open Market Committee (FOMC)** conducts America's **monetary policy**: the actions the Federal Reserve takes to manage the money supply and interest rates to pursue macroeconomic policy objectives.

- manage the money supply and interest rates to pursue macroeconomic policy goals.

The Fed has various *monetary policy tools* at its disposal:

- "Old" **Tools**
  - Open market operations
  - Discount Policy
  - Reserve Requirements
- New Tools (in place since financial crisis of 2007 – 2009)
  - Interest on Reserves
  - Repurchase Agreements and Reverse Repurchase Agreements

The Fed uses these tools to set its *monetary policy targets*:

- The money supply
- The interest rate (primary monetary policy target of the Fed)

There are many different interest rates in the economy; the Fed targets the **federal funds rate**: the interest rate banks charge each other for overnight loans. Also abbreviated as **FFR**.

Why are those targets important for everyday people? They ultimately affect

- unemployment and inflation rates.

Let's examine these monetary policy tools.

Three Old Monetary Policy Tools (pre-2008)

<u>Open Market Operations:</u>

Open Market Operations (OMO) refers to the Fed buying and selling Treasury securities in order to control the money supply. These securities are sold to or bought from the banks.

- Treasury bills – term of 1 year or less
- Treasury notes – term of 2-10 years
- Treasury bonds – term of 30 years

The Fed can use OMO to change the money supply.

To increase the money supply, the Fed buys U.S. Treasury securities from banks.

- The banks get money when they sell the security.

To decrease the money supply, the Fed *sells* its securities.

- Banks buy the securities, then they have less money.

These open market operations can occur very quickly, and are easily reversible.

Why would a bank buy a security?

- It pays interest.

Discount policy

The discount rate is the interest rate paid on money banks borrow from the Fed.

With the discount policy, banks can effectively engage in interest rate arbitrage, borrowing from the Fed at a low (discount) rate, and then lending the money to consumers and businesses at a higher rate.

By lowering the discount rate,

- the Fed encourages banks to borrow (and hence lend out) more money, increasing the money supply.
- raising the rate has the opposite effect.

Reserve requirements

The Fed can alter the required reserve ratio.

A decrease would result in

- more loans being made, increasing the money supply.

An increase would result in

- fewer loans being made.
- Reserve requirement is currently ZERO!!!

The Fed's two monetary policy targets (the money supply and interest rates) are related in an important way:

Higher interest rates result in lower quantity demanded for money.

In other words, an increase in the interest rate results in a decrease in the quantity of money demanded, all other things equal. This would be shown as a movement along the demand curve.

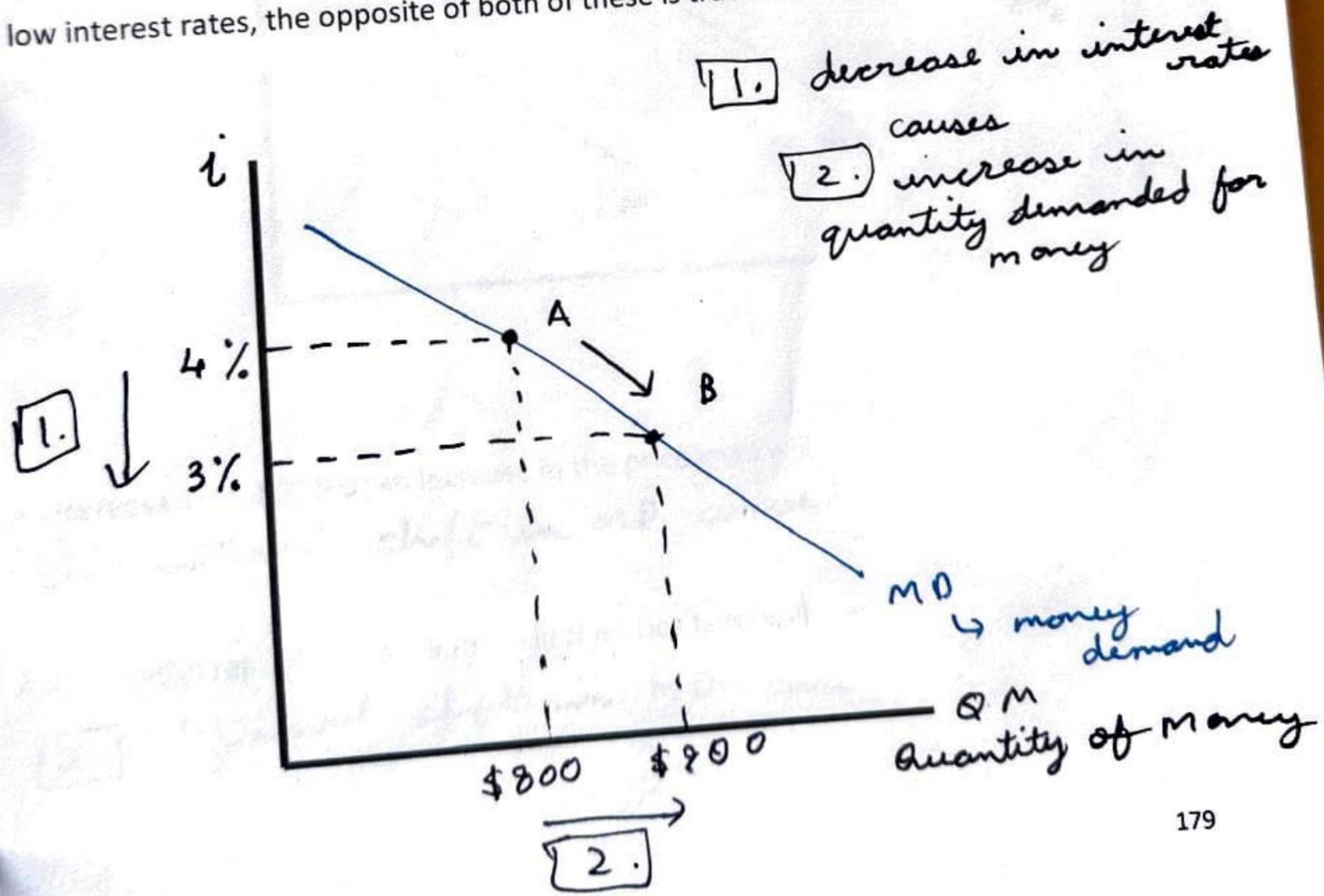
But why is the money demand curve downward sloping?

Remember first that the interest rate is the price of money.

At high interest rates, two things happen:

1. it becomes more expensive to borrow, so firms / households don't borrow as much.
2. Saving becomes more attractive → Higher opportunity cost of holding money.

At low interest rates, the opposite of both of these is true.

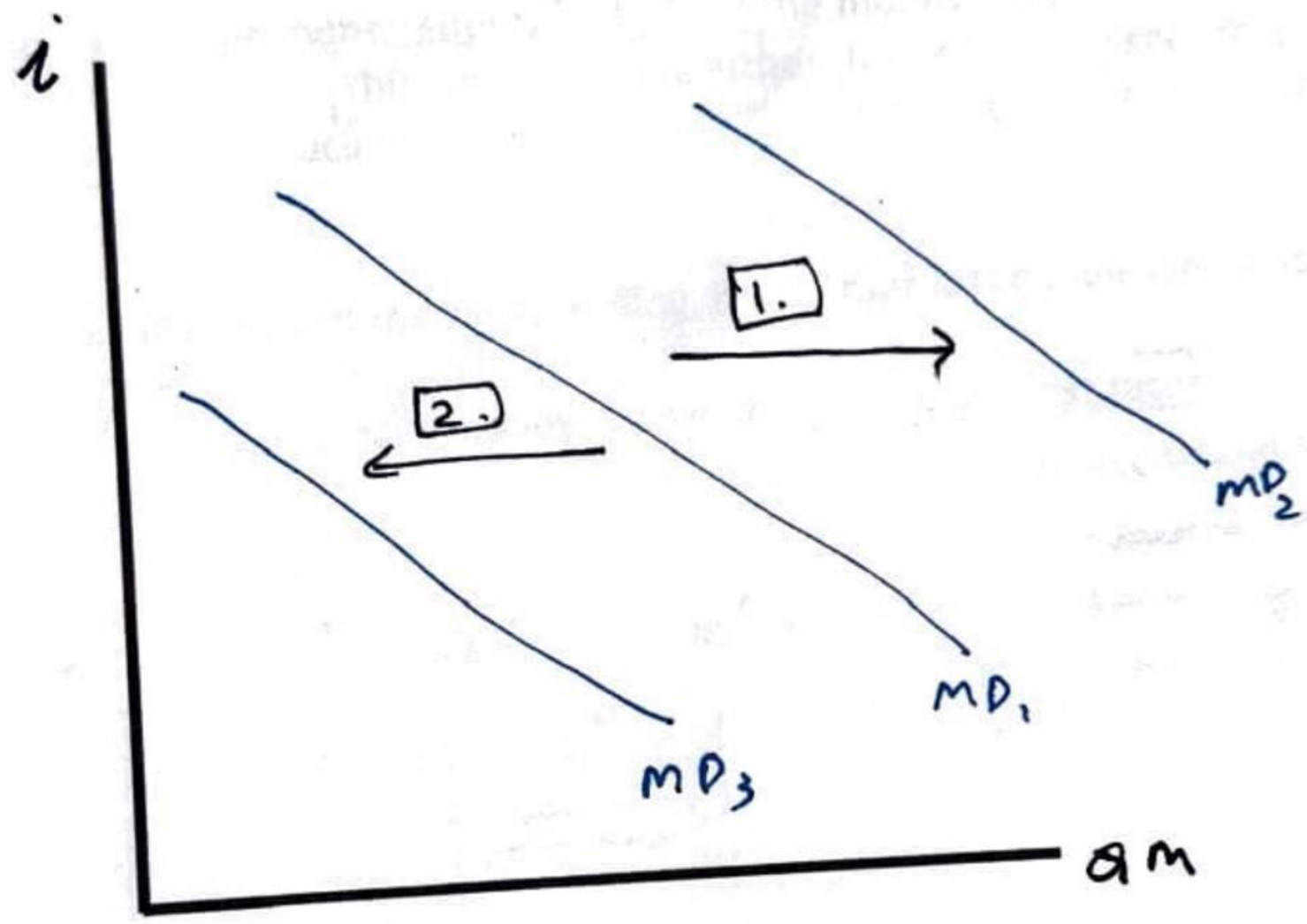


What could cause the money demand curve to shift?

- A change in the *need* to hold money, to **engage in transactions.**

For example, if more transactions are taking place (higher real GDP) or more money is needed for each transaction (higher price level), the demand for money will be higher demand for money. ↑ rightward shift

Changes in real GDP or the price level cause the money demand curve to shift.



An increase in real GDP or an increase in the price level will

1. rightward shift in MD curve

A decrease in real GDP or a decrease in the price level will

2. leftward shift in MD curve

We saw previously that the Fed uses various monetary policy tools to affect the money supply.

For simplicity, we assume the Fed can completely control the money supply. !

Money supply (MS) curve is vertical.
Does not depend on i.

MD = MS

We've seen in practice that this market clears. That is, it reaches equilibrium.

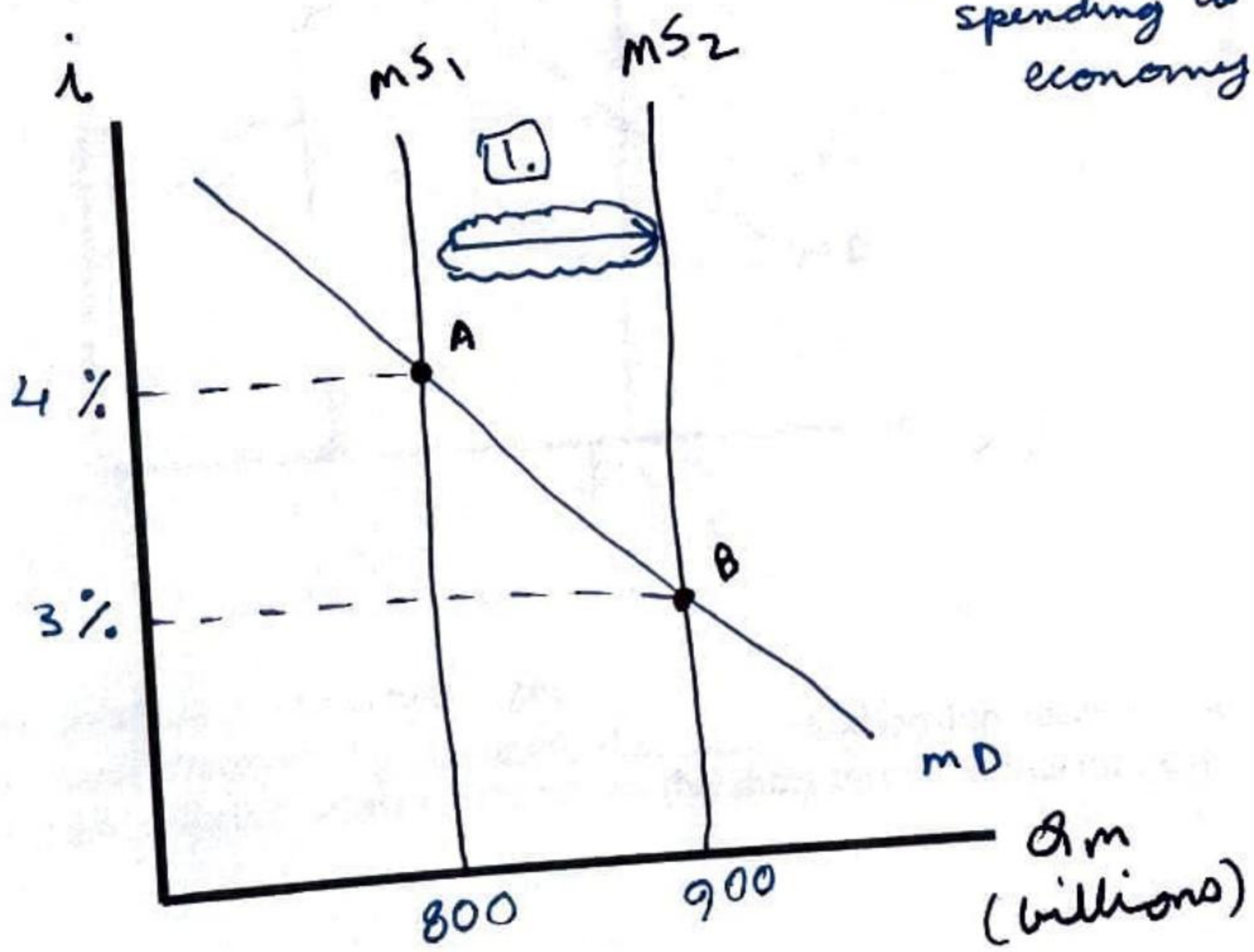
What does an increase in the money supply look like? The money supply (MS) curve would have to shift to the right. This would require either the Fed buying securities from banks through OMO, reducing the discount rate, or reducing the reserve requirement ratio. 1.

With more money available for borrowing/lending, it becomes less expensive to do so,

i rate falls

Why would the Fed want to increase money supply and reduce interest rates?

↳ encourage borrowing and spending to boost economy.



1.

What does a decrease in the money supply look like? The money supply (MS) curve would have to shift to the left. This would require either the Fed selling securities from banks through OMO, increasing the discount rate, or increasing the reserve requirement ratio.

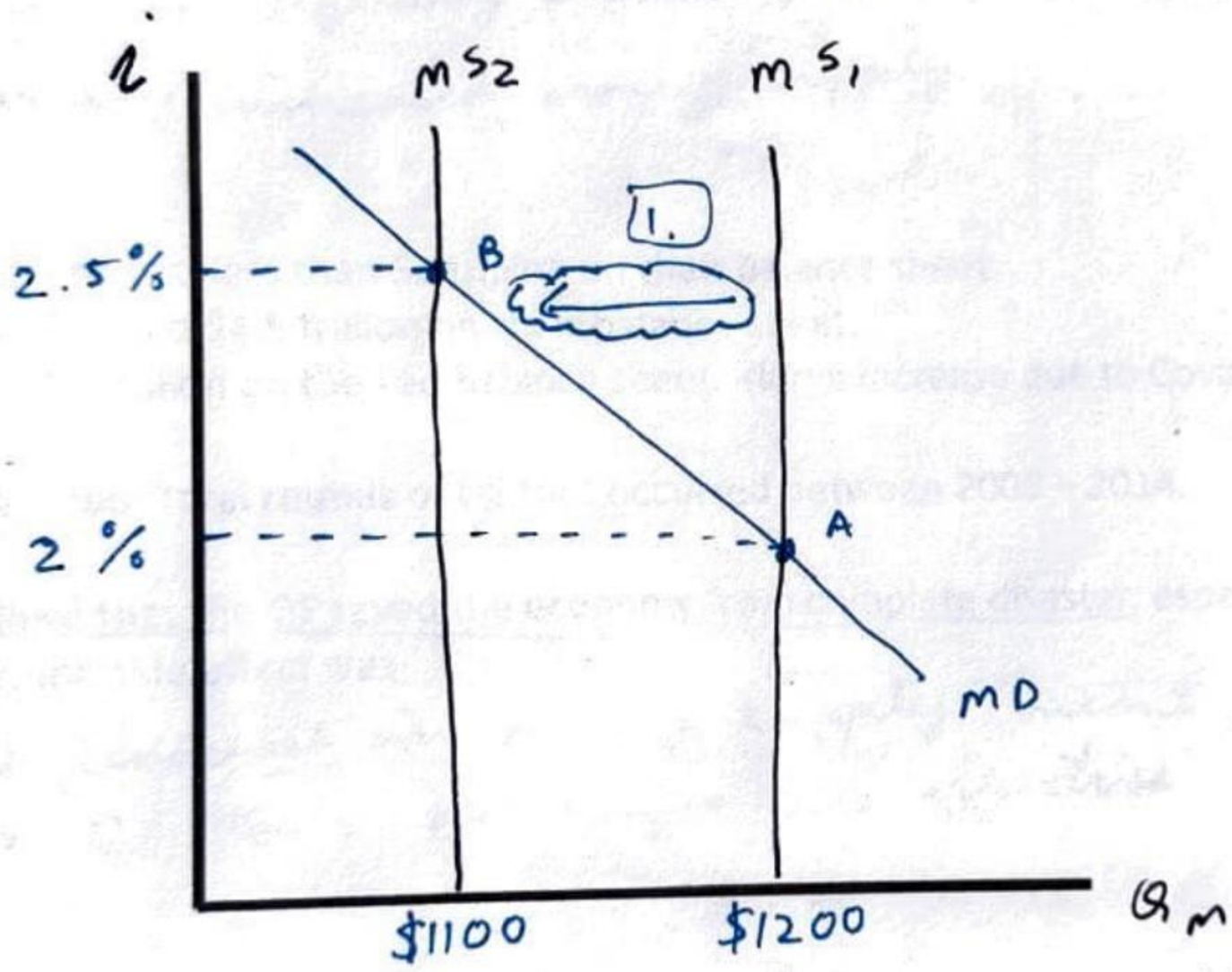
all would decrease MS curve (shift left)

With less money available for **borrowing/lending, it** becomes more expensive to do so,

i rise

Why would **the Fed** **want to reduce** money supply and raise interest rates?

slow down inflation.



Key take away from these previous two pages:

All other things equal, there is an inversel relationship between the money supply and equilibrium interest rate (this is the short term nominal interest rate).

Quantitative Easing and the Financial Crisis

The three "old" tools aren't used as much anymore since they no longer have as much power to affect interest rates.

This is due to unprecedented events taken by the government and Fed during the financial crisis of 2007-2009. During this time, the Fed introduced a new tool called Quantitative Easing (QE) to fix the crisis. Quantitative Easing is also called large scale asset purchases.

Quantitative Easing occurs as the Fed uses newly created money to buy huge amounts of securities from banks.

Money is digitally created, not physically printed.
Greatly increased money supply.

Pre-2008: Fed had less than $1 trillion on their balance sheet.
July 2014: Fed had $4.5 trillion on their balance sheet.
Mid 2020: $7 trillion on the Fed balance sheet. (large increase due to Covid)

There were four total rounds of QE that occurred between 2008 – 2014.

Most believe that the QE saved the economy from complete disaster, especially QE1.
However, the side effect was

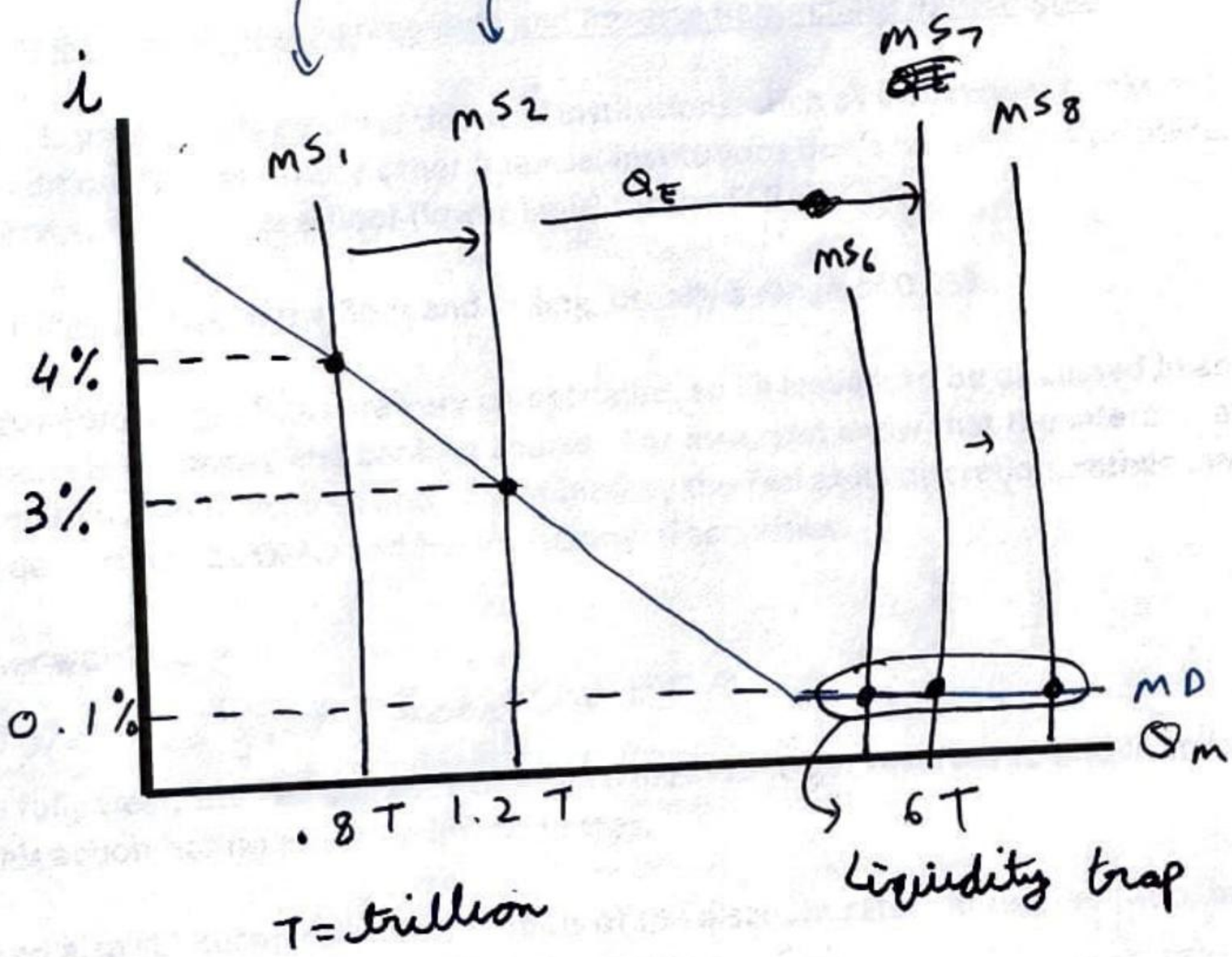
Huge increase in money supply meant that O.M.O tools no longer are effective.

In terms of the money supply, economists sometimes refer to pre-2008 as a time of "limited" or "scarce" reserves.

But due to the large increases in money supply from QE, we are now living in a time of "ample" reserves.

We effectively increased the money supply so much that we forced interest rates to be at or near zero, or possibly even negative. Thus, the previously done OMO, in traditional amounts of buying and selling securities, would have no effect on interest rates with such a huge money supply.

in "scarce" reserves
MS shift affects i



New Monetary Policy Tools

Today, in this time of "ample reserves", the Fed uses two new tools to set a target range for the FFR.

New Tool #1: Interest on reserves

Since 2008, the Fed has paid banks interest on their required and excess reserves. This acts as a ceiling (upper limit) for the FFR.

New Tool #2: Repurchase Agreements and Reverse Repurchase Agreements

This tool is used mostly by other financial institutions, such as investment banks, rather than traditional banks. These other financial institutions don't have access to interest on reserves. This acts as a floor (lower limit) for the FFR.

The FFR stays between the floor and ceiling, usually a range of 0.25%.

The actual workings of this are very complicated, so I'll leave it to be discussed in an intermediate or money and banking course. For now, just know that the interest rates are mostly just administered and determined by the Fed at its discretion, rather than being determined by OMO and buying/selling of securities.

In other words.....

- the Fed just picks the FFR.

To be fully clear, the Fed still uses OMO as a method to get reserves to and from banks. But this action has no effect on interest rates.

The Fed also still technically has the tools of the discount rate and reserve ratio, but these tools today are largely ineffective.

Monetary Policy and Economic Activity

We have seen that the Fed can use its monetary policy tools to affect the interest rate and money supply. However, the ultimate goal is to address the macroeconomic variables of inflation and unemployment.

As such, we need to see how interest rates affect the price level and output by looking at changes in aggregate demand that occur when interest rates are changed by the Fed.

Interest rates affect aggregate demand (AD) through consumption, investment, and net exports.

Consumption

- Lower interest rates encourage buying on credit,
  - affects the sales of durables.
- Lower rates also discourage saving.

Investment

Lower interest rates encourage capital investment by firms and encourage new residential investment by households. Lower interest rates:

- Make it cheaper to borrow (firms sell corporate bonds)
- Make stocks more attractive for households to purchase (relative to other alternatives), allowing firms to raise funds by selling additional stock.

Net exports

- Low U.S. interest rates:
- Americans want to buy foreign securities that pay more.
- Higher demand for foreign currency.
- Lowers the $US exchange rate. cheaper to get $.
- Net exports to rise.

All of these work in the same direction!

Higher interest rates lead to AD shift left

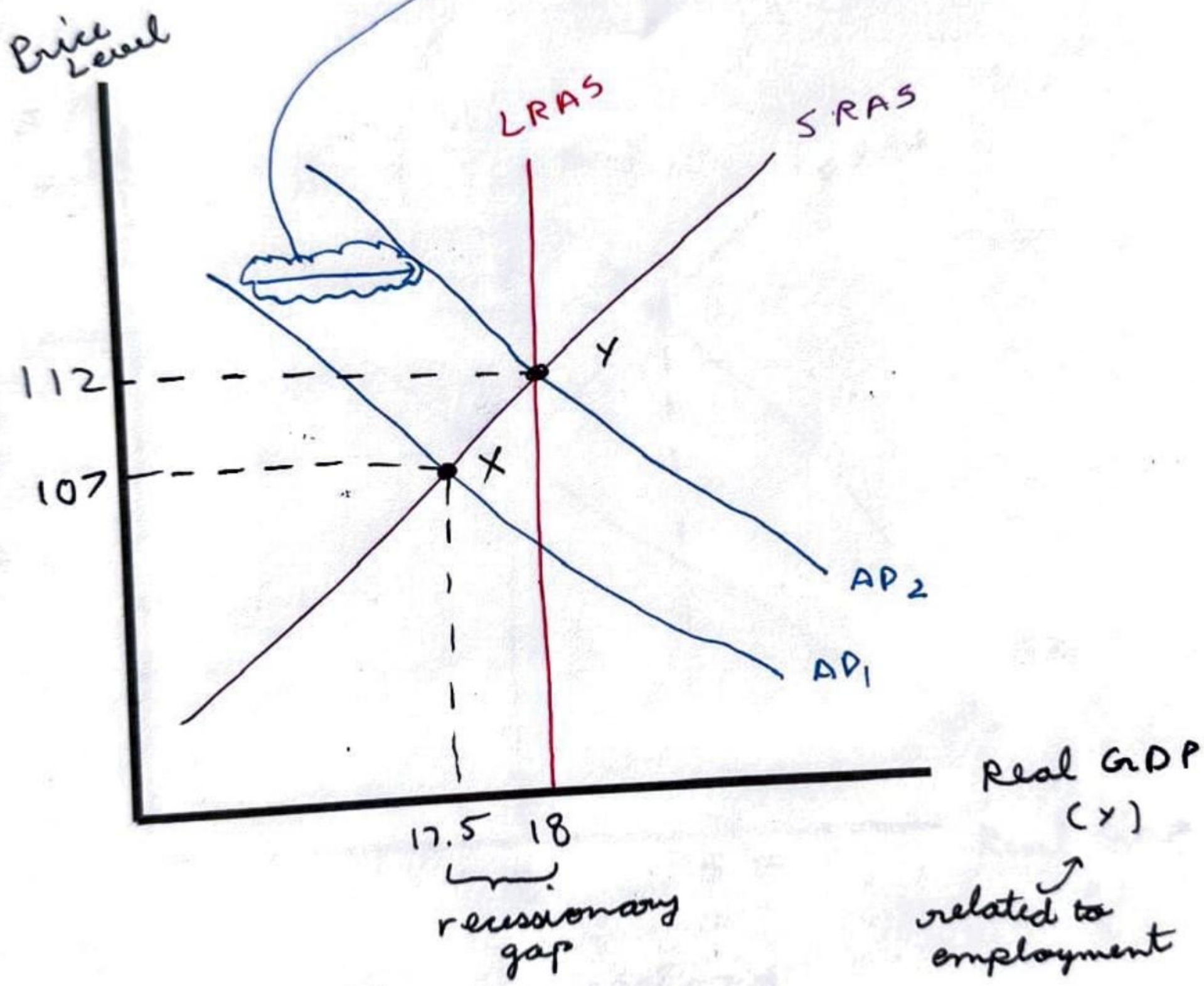
Lower interest rates lead to AD shift right.

The Fed conducts **expansionary monetary policy** when it takes actions to decrease interest rates to increase real GDP.

The Fed would take this action when short-run equilibrium real GDP was below potential real GDP.

$i\downarrow \rightarrow (C\uparrow, I\uparrow, NX\uparrow) \rightarrow AD\uparrow \rightarrow$ (Real GDP ↑, price level ↑)

↳ goal: gets back to full employment



Sometimes the economy may be producing *above* potential GDP.

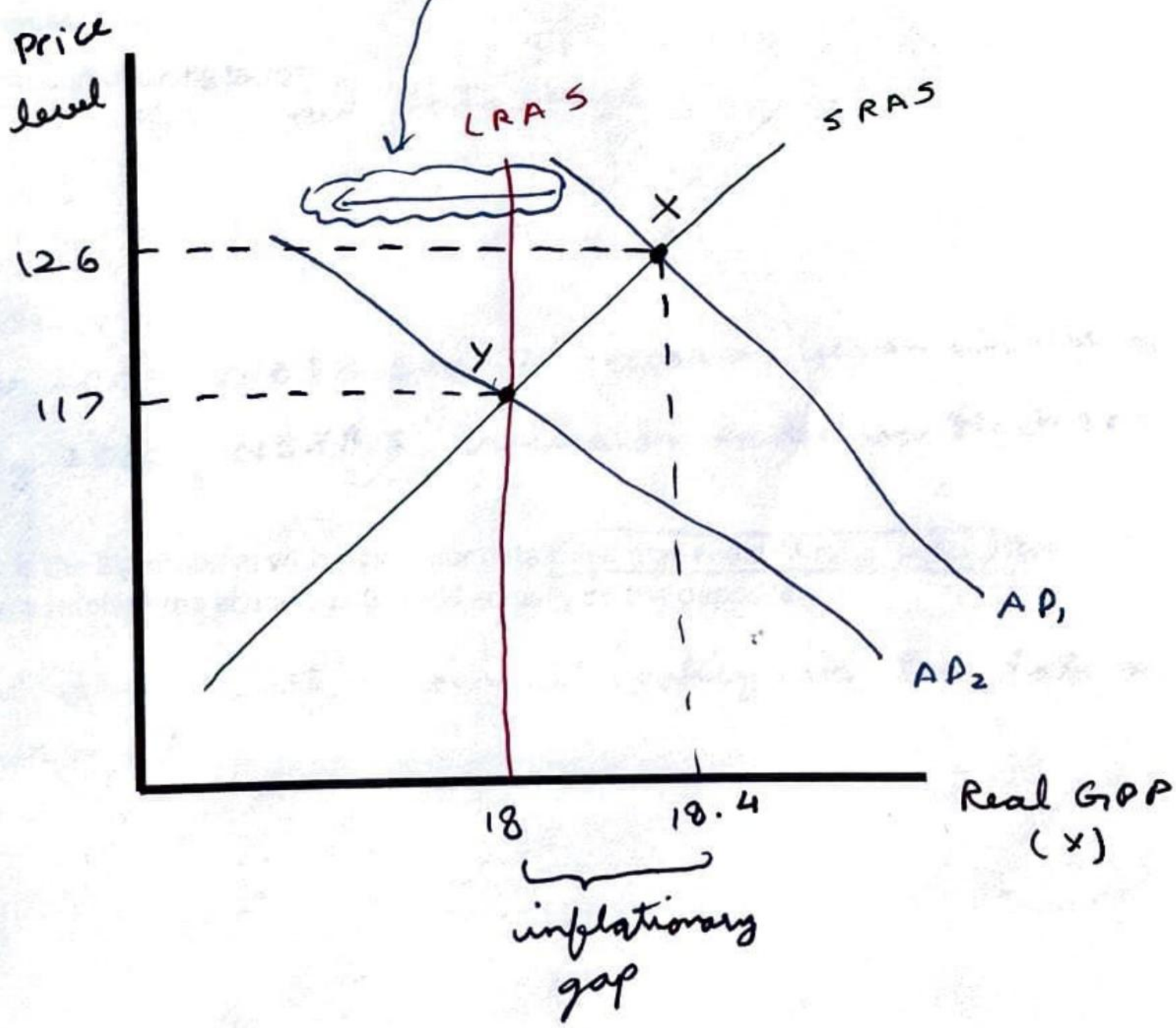
- In that case, the Fed may perform **contractionary monetary policy**: increasing interest rates to reduce inflation.

Why would the Fed intentionally reduce real GDP?

- The Fed is mostly concerned with *long-run* growth.

$i \uparrow \rightarrow (C\downarrow, I\downarrow, NX\downarrow) \rightarrow AD\downarrow \rightarrow$ (real GDP ↓, price level ↓)

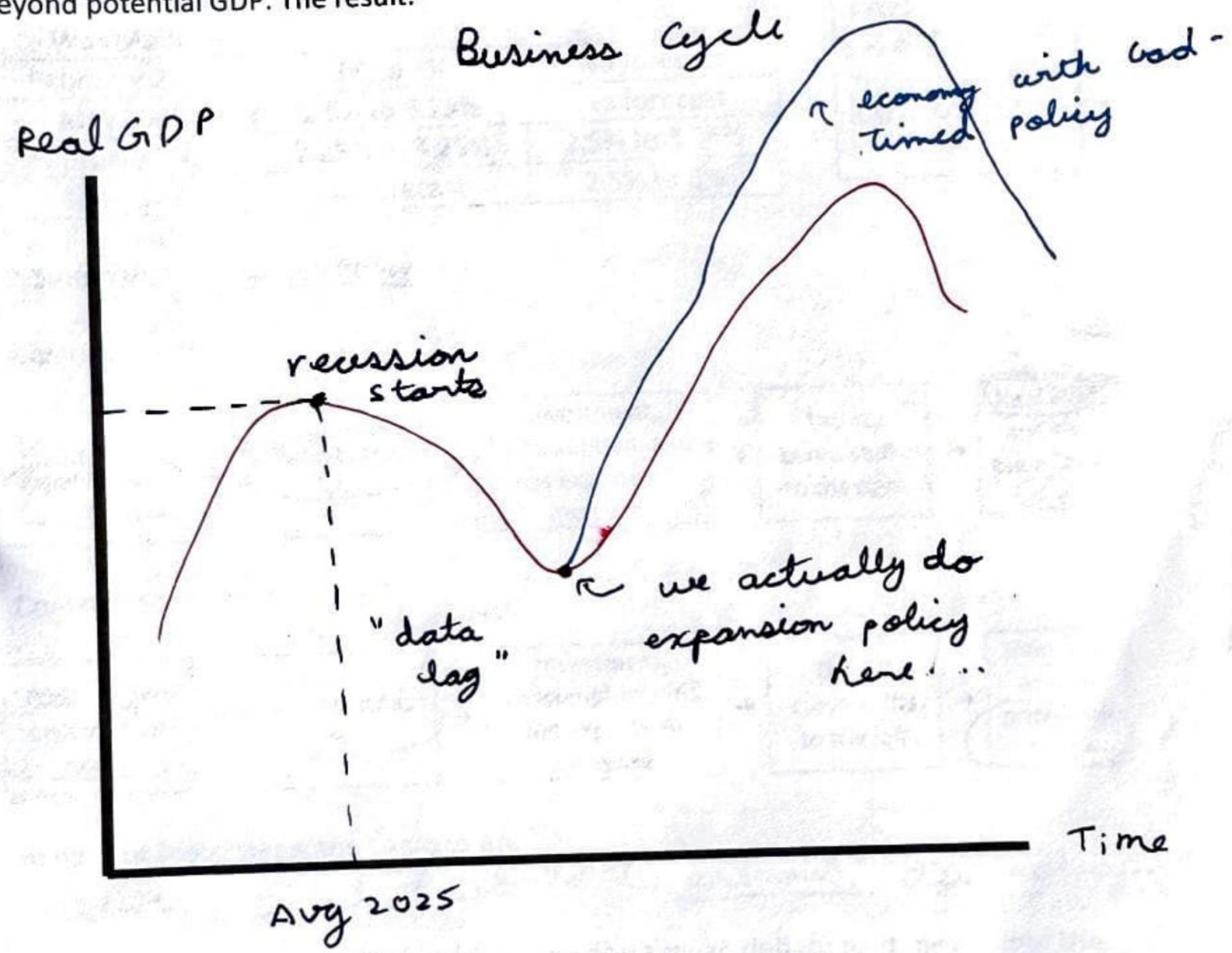
↓ good



Suppose a recession begins in August of this year.

- The Fed finds out about the recession with a lag. In March of next year, the Fed starts expansionary monetary policy, but the recession has already ended.

By keeping interest rates low for *too* long, the Fed encourages real GDP to go far beyond potential GDP. The result:



The Fed tries to set policy according to what it *forecasts* the state of the economy will be in the future.

good policy requires accurate forecasts!

The forecasts of most economists in 2006/2007 did not anticipate the severity of the coming "Great Recession" of 2007 – 2009.

Fed missed the opportunity to "dampen" the severity

	Forecasted Growth Rates	
Date Forecast Was Made	**For 2007**	**For 2008**
February 2006	3% to 4%	No forecast
May 2006	2.5% to 3.25%	No forecast
February 2007	2.25% to 3.25%	2.5% to 3.25%
July 2007	No forecast	2.5% to 3%

Actual growth rates?
2007: 1.9%
2008: -0.1%

A Summary of Monetary Policy

Expansionary Policy:

FOMC orders expansionary policy → Interest rates fall → Investment, consumption, and net exports all increase → The AD curve shifts to the right → Real GDP and the price level rise

Contractionary Policy:

FOMC orders contractionary policy → Interest rates rise → Investment, consumption, and net exports all decrease → The AD curve shifts to the left → Real GDP and the price level fall**

In each of these steps, the changes are relative to what would be without the policy.

** When we state "the price level falls" we don't mean deflation. It means that the price level is lower than it otherwise would have been. The contractionary policy is done in an effort to fight inflation.

Expansionary monetary policy is sometimes called "loose" or "easy" monetary policy. Contractionary monetary policy is "tight" monetary policy.

An alternative to targeting interest rates or the money supply is to target *inflation*.

Inflation targeting: Conducting monetary policy so as to commit the central bank to

This policy has been adopted by central banks in some other countries, including Canada and the UK, and by the European Central Bank.

The typical outcome of adopting inflation targeting appears to be that

In 2012, the Fed announced its first explicit inflation target:

For inflation targeting:

- Makes it clear that the Fed cannot affect real GDP in the long run.
- Easier for firms and households to form expectations about future inflation, improving their planning.
- Reduces chance of abrupt changes in monetary policy (for example, when members of the FOMC change).

Against inflation targeting:

- Reduces the Fed's flexibility to address other policy goals.
- Increased focus on inflation rate may result in Fed being less likely to address other beneficial goals.

Criticisms of the Fed

Main concerns:

- Lack of transparency
- Too reactive (instead of proactive)
- Keeps interest rates too low for too long

- QE was just "money-printing"

Other Notes and Terminology with the Fed

Is the Fed part of the Government or not?

According to the Fed:
"The Federal **Reserve Banks are not a** part of the federal government, but they exist because of an act of Congress. **Their purpose** is to serve the public. So is the Fed private or public? The answer is both. While the Board **of Governors** is an independent government agency, the **Federal Reserve Banks are** set up like private corporations."

The Fed is accountable to Congress.

Fight Inflation or Not?

Monetary hawk: Someone who advocates for low inflation and therefore higher interest rates.

Monetary dove: Someone who emphasizes unemployment before inflation, and is less likely to desire higher interest rates.

Fed balance sheet: current listing of assets and liabilities held by the Fed.
The Fed balance sheet typically increases during recession fears when the **Fed** buys a lot of securities from banks, providing banks with liquidity.
When the economy grows stronger and worries subside, the Fed starts to reduce its balance sheet.
- This would decrease the money supply.

Basis points
Changes to the FFR are usually discussed in terms of "basis points". A basis point is 1/100th of a percent.
Example: If the Fed raises the target FFR by 0.75%, we say they increased the FFR by 75 basis points.

Chapter 16: Fiscal Policy

Recall that Government Purchases (G) is a component of real GDP:

$Y = C + I + G + NX$

This makes it appear as though increases in government purchases increase output—and hence other relevant economic variables like employment.

This introduces a very important question: Can government directly increase employment by spending increases? What is the effect of GDP from an increase in government spending?

- Increase total employment?
- or just shifting resources from private to public.

This debate is often revisited during recessions or other concerning economic events.

Fiscal policy is when we attempt to achieve macroeconomic policy objectives through changes in

- federal taxes (T)
- government purchases (G)
- transfer payments (TR)

We emphasize Federal in this case. State and local taxes and spending are not generally aimed at affecting national-level objectives, and therefore are not broadly considered fiscal policy.

Some forms of government spending and taxes automatically increase or decrease along with the business cycle; these are **automatic stabilizers**.

Two examples:

- Unemployment insurance payments are larger during a recession.
- Progressive income taxes - can "slow down" spending during high growth.

Discretionary fiscal policy, on the other hand, refers to intentional actions the government takes to change spending or taxes.

Before the Great Depression of the 1930s, most government spending was at the state or local level; now the federal government's share is two-thirds to three-quarters.

As a percentage of GDP, federal expenditures have been slowly trending upward for the last 70 years. However, a smaller proportion is now spent on government purchases of goods and services (mostly military spending).

Federal *purchases* (G) consists of defense spending and other government spending that results in goods or services directly being produced in return.

- salaries govt employees, operating national parks, and funding scientific research.

Around half of federal *expenditures* are spent on transfer payments,

- like Social Security, Medicare, and unemployment insurance.

The rest is spent on grants to state and local governments to support their activities, like crime prevention and education; and on paying interest on the federal debt.

Federal Government Expenditures, 2022

Category	Percentage of Federal Government Expenditures
Transfer Payments	47.9%
Grants to State and Local Government	15.8%
Defense Spending	15.3%
Interest Payments on Debt	11.8%
Subsidies to Businesses	2.0%
Other	7.2%

Transfer payments rose from 25% of federal government expenditures in the 1960s to 47.9% in 2022.

Where does the government get its revenues from?

The majority of federal revenues come from taxes on individual employment:

- individual income taxes
- "payroll taxes" to fund Social Security and Medicare.

Sources of Government Revenue, 2022

Category	Percentage of Federal Government Revenue
Individual Income Taxes	52%
Social Insurance Taxes	32.8%
Other Taxes and Sources of Revenue (excise taxes, tariffs, payments made for Federal land use, profits from Federal Reserve holdings)	8.5%
Corporate Income Taxes	6.7%

Social insurance taxes fund Social Security and Medicare programs. Firms pay half of these taxes and employees pay the other half.

Social Security and Medicare: Fiscal Time Bomb?

The federal entitlement programs of Social Security and Medicare have helped to reduce poverty among the elderly, while Medicaid helps improve the health of poor people. But these programs, particularly Social Security and Medicare, are facing difficulties.

Two main issues:

- the aging population
- rising health care costs
- These two issues are linked.

These issues are causing increasing budget troubles for the programs.

- Budget shortfall estimated to be almost $60 trillion by year 2090.

How can these programs continue to exist?
It is likely that a combination of these measures will eventually need to be adopted:

- Increasing taxes
- Decreasing benefits (or slower benefit growth)
- Decreasing eligibility (raise retirement age)

But perhaps the most important element will be finding a way to reduce medical costs.

Is Social Security Ponzi Scheme?

What is a Ponzi scheme?

Named after Charles **Ponzi** (1920), although there may have been instances of the scheme as early as **the** 1860s. The earliest well-known example from the USA was from the 1870s **and operated** by con artist Sarah Emily Howe.

A Ponzi scheme is a scam that promises investors high rates of return. But rather than investing in legitimate businesses or securities,

- It pays early investors with payments from later investors.

The early investors get big returns as promised, so they invest more, and more people invest as well. The new money brought in is paid out to prior investors, while the person operating the scam takes money for himself as well. This eventually becomes unsustainable and collapses.

Early investors: May get large returns, but illegitimate

Later investors: Likely to lose everything they invest.

Most famous example:

- Bernie Madoff, 2008. $65 billion.
- He was once chairman of NASDAQ stock exchange!

How does Social Security Operate?

People working today pay OASDI taxes (commonly called social security taxes) into the Social Security Trust Fund.

However, when you pay money into social security, the money doesn't stay there for long, and it doesn't stay there for you.

- Money gets paid out to old people today.

From ssa.gov:

"The money you pay in taxes is not held in a personal account for you to use when you get benefits. Today's workers help pay for current retirees' and other beneficiaries' benefits. Any unused money goes to the Social Security trust funds to help secure today and tomorrow for you and your family."

By definition, this sounds very much like a Ponzi scheme!

So is social security a Ponzi Scheme? Or is it just insurance against getting old?

Problem:

- Most people get old!
- Concept of "insurance" seems unsustainable.

Year	Full Retirement Age	Average Lifespan
1935	65	62
Today	67	78

Questions about participation:

- Should it be opt-in?
- Right now, requirement for most.

Why might Social Security be considered a Ponzi Scheme?	Why might Social Security NOT be considered a Ponzi Scheme?
Today's workers are funding yesterday's workers' retirements Not enough funds for everyone to cash out with what they put in constant concerns about insolvency	Money is invested in "real" life" investments, treasury bills. Transparent accounting. Program is mandatory. Operators not stealing. Continual fixes and adjustments by Congress.

Can the Fed Eliminate Recessions?

In the previous demonstration of monetary policy, the Fed

- Knew how far to shift aggregate demand, and
- Was able to shift aggregate demand exactly this far.

In practice, monetary policy is *much* harder to get right than the graphs make it appear.

Completely offsetting a recession? very difficult ...

Best bet is we can reduce length, severity & number of recessions.

Another complicating factor

↳ we often have data lags

Example:

Nov 2001: NBER says: "recession began in March 2001"

Early 2002: NBER: "recession ended in Nov 2001"

What is the big problem with lags in our data? Fed may enact "wrong" policy. This doesn't stabilize the economy. It could actually do the opposite.

bad things will happen if policy is too late or wrong!

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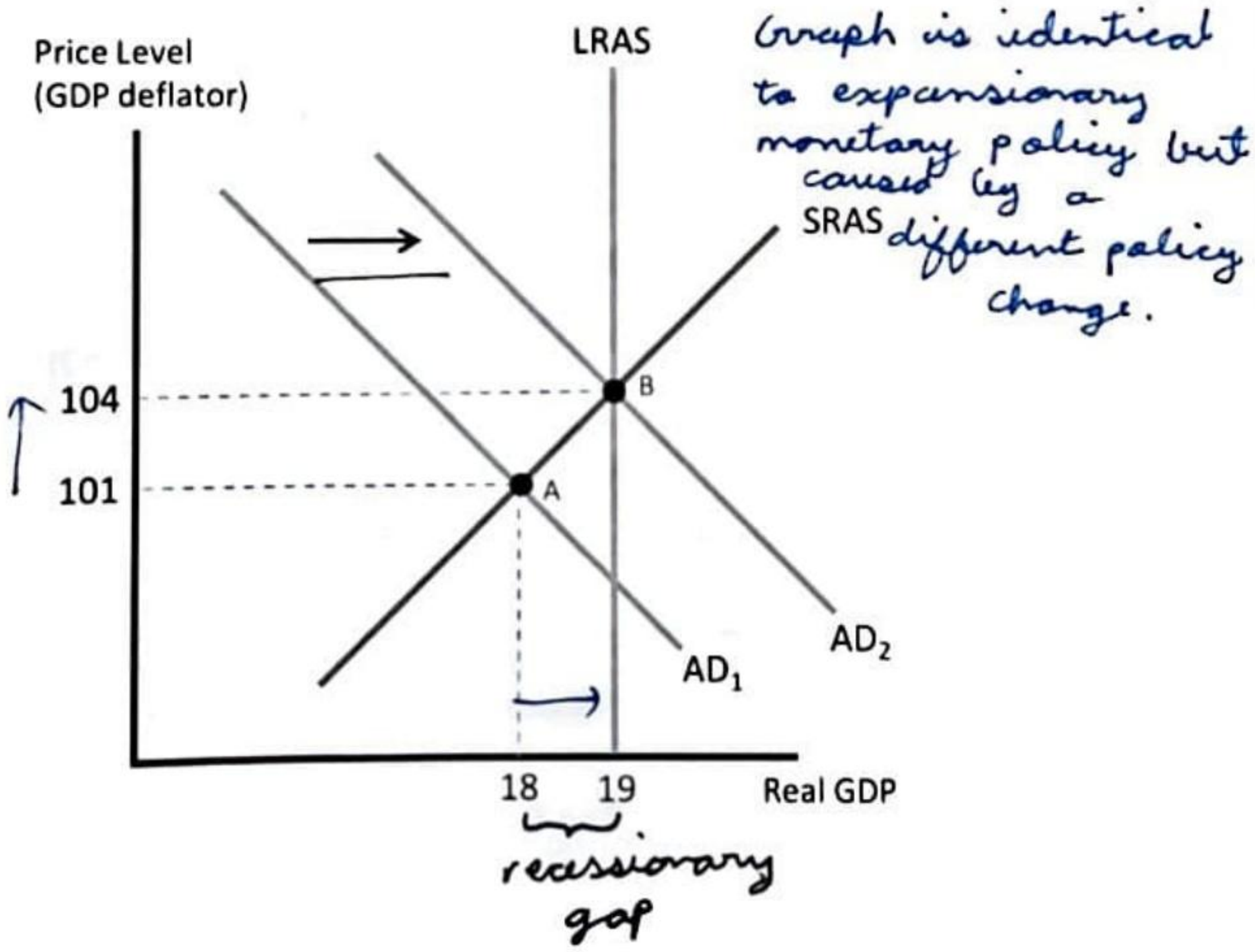
Effects of Fiscal Policy on Real GDP and Price Level

Expansionary fiscal policy: increasing government purchases or transfer payments, or decreasing taxes.

G↑ ⟶ AD↑
(TR↑ or T↓) → C↑ ↗ shift right → (Real GDP ↑, price level ↑)
↳ related to employment.

If the government believes real GDP will be **below potential GDP**, it can enact **expansionary fiscal policy** in an attempt to restore long-run equilibrium—



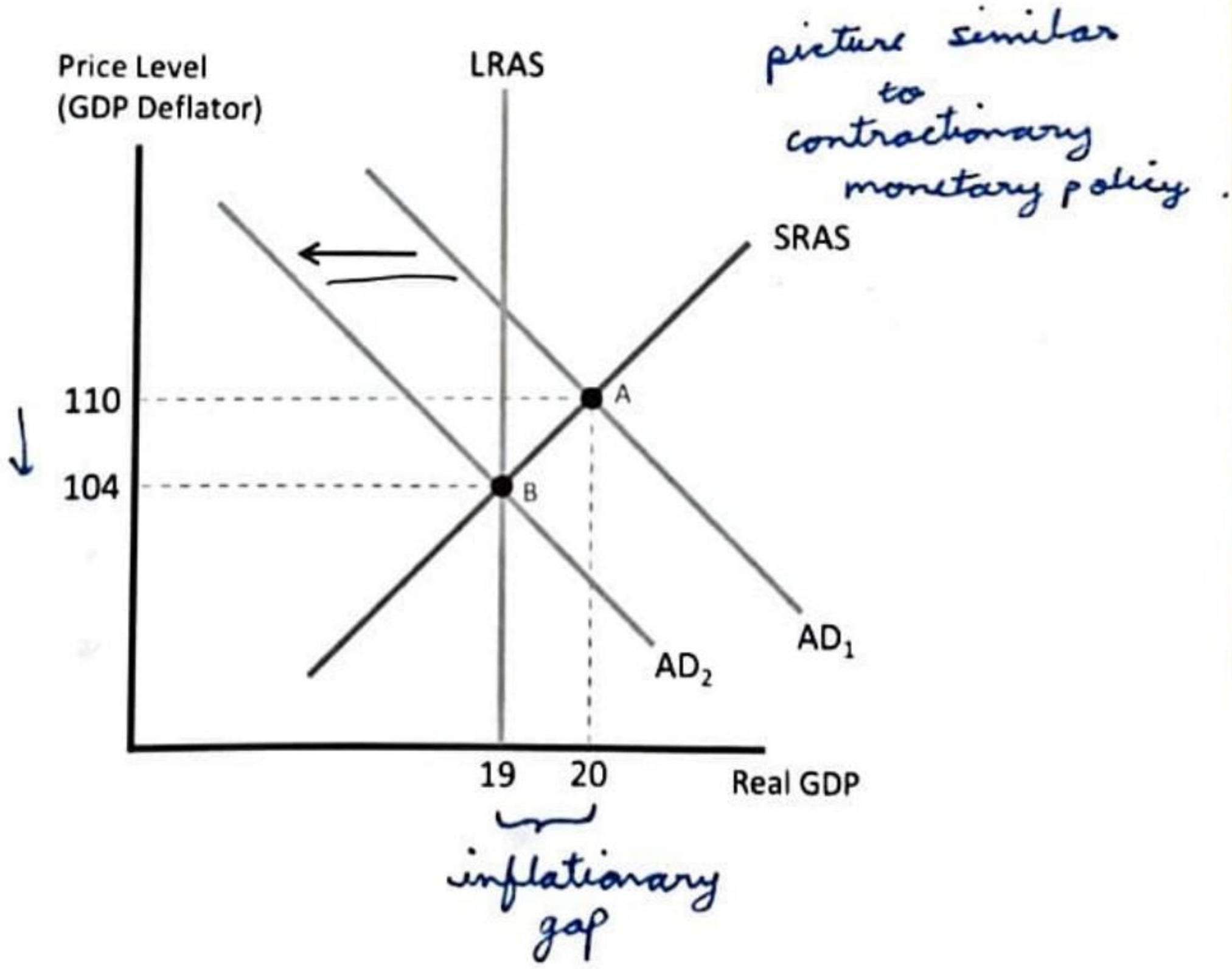
Graph is identical to expansionary monetary policy but caused by a different policy change.

Contractionary fiscal policy: decreasing government purchases, or increasing taxes.

G↓ ⟶ AD↓ (shift left) → (price level↓, Real GDP↓)

(TR↓ or T↑) → C↓ ↗

If the government believes real GDP will be **above potential GDP**, it can enact **contractionary fiscal policy** in an attempt to restore long-run equilibrium—



In reality, contractionary fiscal policy is very rarely used.

Why? Politically unpopular!

If done, often for reasons of balancing budgets, not to "slow down" economy

Data shows that the incumbent president is more likely than not to get re-elected, except during a recession! So think about the incentives there. If a president really wanted to fight inflation with contractionary fiscal policy, they are more likely to do it when? 2nd term!

As a result, contractionary policy is most often through monetary policy and the Federal Reserve instead of through fiscal policy.

Another reason to keep the Fed separate from the govt.

State and local governments increase taxes and cut spending more frequently than the federal government. The reason?

Budgets.

Federal Government example of contractionary fiscal policy:

President Bill Clinton reduced duration of welfare benefits and created more strict eligibility requirements for the program (decreasing G), and increased the top marginal income tax rate from 31% to 39.6% (increasing T).

He actually did these policies during his first term, but

- they were politically popular at the time!
  - & did this during a long expansion. resulted in a budget surplus!

The **federal** government's **actions described on the previous pages constitute a** *countercyclical fiscal policy*.

going against the business cycle.

Problem	Type of Policy	Actions by Congress and the President	Result
Recession	Expansionary	Increase government purchases or transfer payments, or decrease taxes	Real GDP and the price level rise
Rising inflation	Contractionary	Decrease government purchases, or increase taxes*	Real GDP and the price level fall**

Given this table, keep the following in mind:
The effects described assume *ceteris paribus*: everything else is staying the same, including monetary policy.

* I specifically do not mention "decrease transfer payments" here.

Some transfer payments are legislated as temporary or as a one-time event, such as a stimulus package. Choosing to NOT have a transfer payment stimulus again in the following year would not be considered contractionary policy.

Temporarily or permanently decreasing scheduled transfer payments is exceedingly rare – and even when that is done, it is not done for the purposes of contractionary policy. It is rather done for budget balancing purposes or as a way to keep entitlement programs sustainable.

** Contractionary fiscal policy is not really causing prices to fall (deflation).

really just disinflation

If the government increases spending on goods and services, increasing G, then aggregate demand increases immediately. If there is a decrease in taxes (T) or an increase in transfer payments (TR), there will be some immediate increase in consumption, which also increases aggregate demand.

autonomous increase in AD. 1.

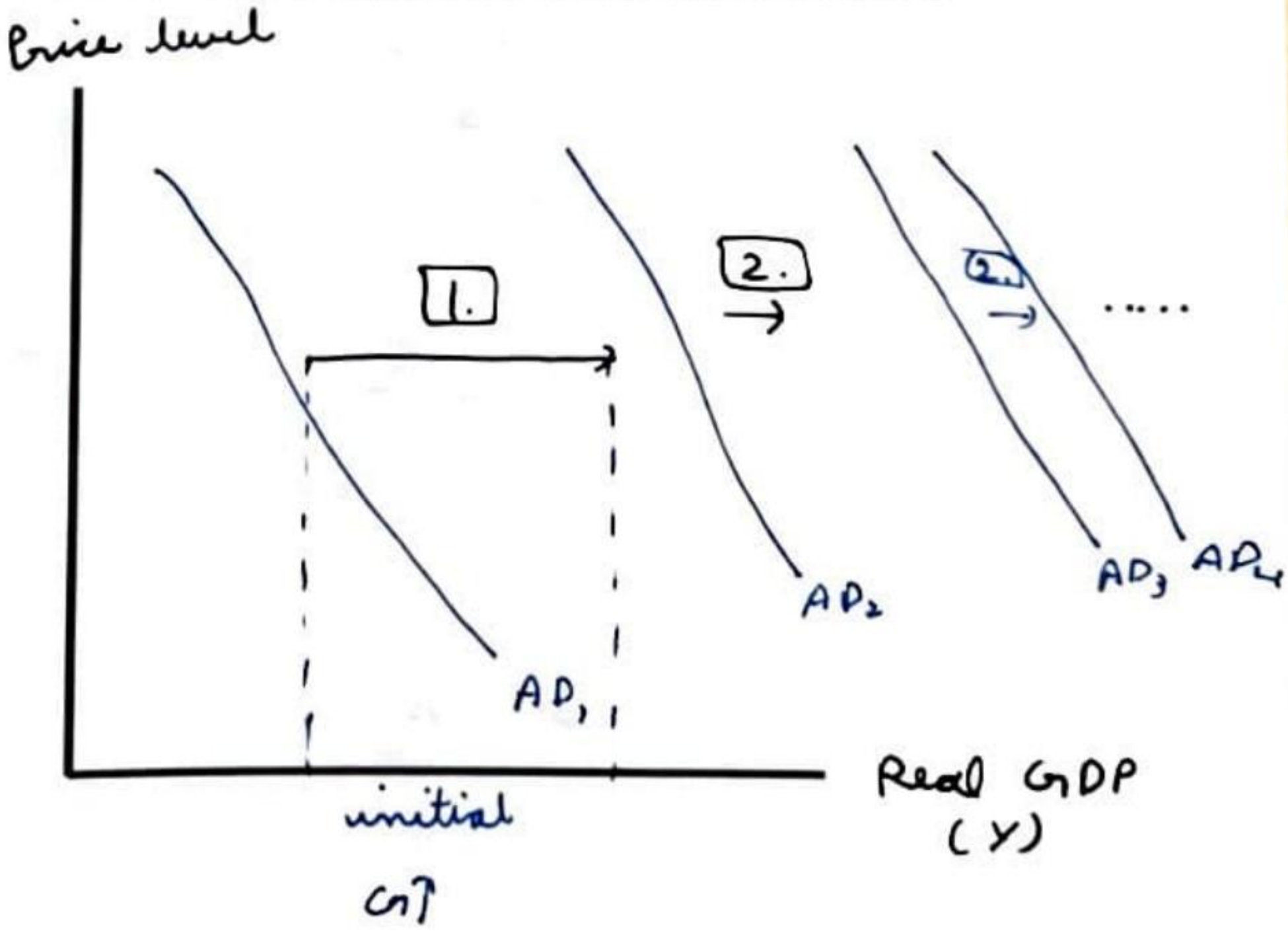
We must also recall the MPC and the multiplier effect.

$$C = \overline{C} + MPC \times Y$$

The increased autonomous spending will result in people receiving this spending as income. But with this higher income, people increase their consumption spending accordingly. That consumption spending leads to even further income increases and spending....

2. This leads to further induced spending increases.

We talked about induced spending effects and the multiplier in Chapter 12 in our aggregate expenditure model. We can graph the effect here, focusing on AD.



We can describe the total effect fiscal policy by measuring the change in equilibrium real GDP. Since fiscal policy can be done by either changing government purchases (G), transfer payments (TR) or taxes (T), we have three multipliers to consider. The government purchases multiplier, transfer payment multiplier, and tax multiplier.

Government purchases multiplier $= \dfrac{\Delta \text{ in equilibrium real GDP}}{\Delta G} > 0$

Transfer payment multiplier $= \dfrac{\Delta \text{ in equilibrium real GDP}}{\Delta TR} > 0$

Tax multiplier $= \dfrac{\Delta \text{ in equilibrium real GDP}}{\Delta T} < 0$

Further, these multipliers can work in both directions. In other words, AD can shift by a multiple of the original spending change in a positive or negative direction.

Any expansionary fiscal policy will result in a → positive multiplier shift AD right

G↑, TR↑ or T↓

Any contractionary fiscal policy will result in a → negative multiplier shift AD left

G↓, TR↓, or T↑

Other notes on these multipliers

We expect the transfer payment multiplier and tax multiplier to be *smaller* (in absolute value) than the government purchases multiplier. Why?

GT by $200 billion, initial AD shift = $200 billion

But, T↓ or TR↑ by $200 billion, initial < $200 billion AD shift (save some $)
(cT)

In the simplest case, the tax multiplier applies to changes in the *amount* of taxes, without changes in *tax rates*.

Example: In 2009 and 2010, the federal government enacted the Making Work Pay Tax Credit: a $400 reduction in taxes for working individuals ($800 for households).

Decreases in tax *rates* have a slightly different and more complicated effect: A decrease in tax rates will still increase the disposable income of households, leading them to increase their consumption spending.

But it will also increase this consumption multiplier at each step of induced spending.

The relevance of multipliers

Multipliers do exactly what their name implies. They multiply spending. This means that in order to close a recessionary gap, the initial spending amount needed will be less than the size of the shortfall.

As a quick example, suppose the government purchases multiplier is 1.5. If we have a recessionary gap of $210 billion, we don't need to increase G by the full $210 billion to close this gap. We can increase G by just $140 billion. This amount will get multiplied by 1.5 (by means of repeated induced spending), and will reach a $210 billion increase in AD.

We've already discussed how contractionary fiscal policy is politically unpopular, and thus is less likely to occur than contractionary monetary policy. However, fiscal policy may also have problems compared monetary policy at expansionary countercyclical stabilization:

First, there may be timing issues.

Legislative delay: Congress has to approve spending.

Implementation delay: Large (G) projects sometimes take years to finish, even after legislative approval.

Taxes (T) often changed yearly.

It should be noted that fiscal policy isn't always slow. Transfer payments have historically been approved and distributed very quickly during extreme economic duress (Great Recession, Covid). These direct cash injections are likely stimulus faster, more immediately effective than the monetary policy of reducing interest rates.

Second, expansionary fiscal policy necessarily comes with an increased government budget deficit.

Large & repeated deficits eventually become unsustainable

Third, increasing government purchases (G) may result in crowding out.

Crowding out: A decline in private expenditures (C, I, NX) as a result of an increase in government purchases (G).

Crowding out in the Short Run

Short-run crowding out was first discussed in Chapter 10. To fund a deficit, the government issues securities. This alternative to saving in private markets reduces the supply of loanable funds. With less funding available, firms can't borrow as much, so investment spending decreases. Further, this reduction in the supply of loanable funds

Crowding out in the Long Run

In the long run, the increase in government purchases will have no effect on real GDP; the reduction in consumption, investment, and net exports will exactly offset the increase in government purchases.

Why? Because *in the long run,*

- the economy returns to potential GDP, even without government intervention.

The long run effect of increased government spending?

- Increased size of government as a percentage of GDP.

Costs:

- Government is "larger"

Benefits:

- Intermediate increase in real GDP may be worth the cost.

Long Run Fiscal Policy

The fiscal policy we have concentrated on so far was intended to address short-run goals of stabilizing the economy.

- But other fiscal policy actions are intended to have long-run impacts on potential GDP—i.e. on *aggregate supply*, rather than *aggregate demand*.

- Hence these actions are often referred to as supply-side economics.

Most such policies are based on changing taxes in order to

- increase incentives to work, save, invest, and start a business.

Most taxes are assessed as a percentage of some economic activity, like individual income, corporate income, or capital gains.

- When an individual decides how much to work, he bases the decision on how much an hour of work will increase his ability to consume goods and services—in other words, his take-home pay.
- the post-tax wage

- When a firm decides how many people to employ, it considers how much it has to pay in total for each worker:
- the pretax wage

Tax wedge: the difference between the pretax and post-tax return to an economic activity. Consider an employee. In this case, the tax wedge is the difference between the firm's cost of employing the worker vs. how much money the worker takes home after taxes.

What's the importance of this?

- A large tax wedge:
  - distorts the incentives of individuals and firms
  - resulting in lower levels of economic activity.
  - lower real GDP.

Tax rates matter because the larger they are, the larger will be the *behavioral response* to the tax:

Individual income tax
- Affects labor supply decisions and returns to entrepreneurship.

Corporate income tax
- Affects incentives of firms to engage in investment

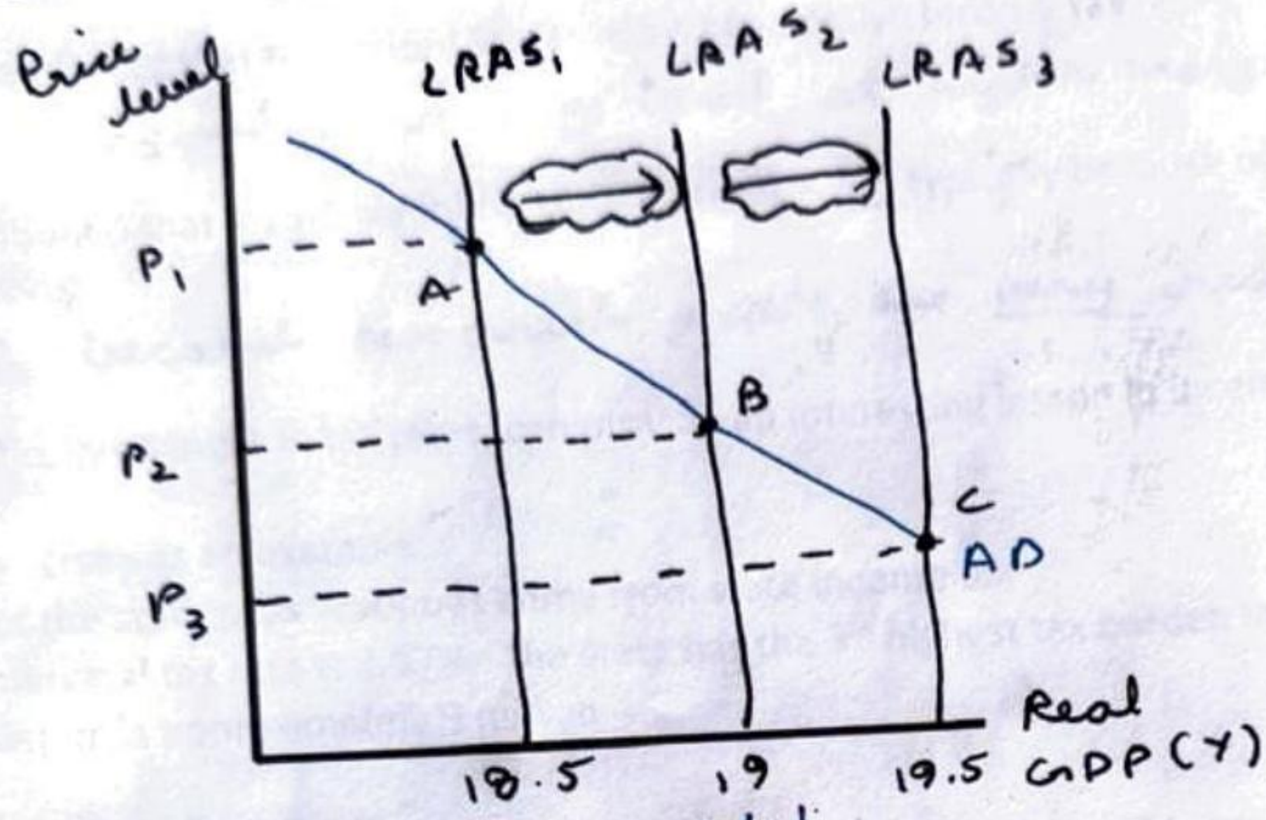
Tax on dividends and capital gains
- Affects supply of loanable funds from households, and hence the real interest rate.

Even just figuring out how much money you owe in taxes is a deadweight loss on society.

- The current tax code is extremely complicated—over 3,000 pages long.
- The IRS estimates that taxpayers spend more than 6.4 billion hours each year filling out their tax returns—45 hours per tax return.
- A simplified tax code would increase economic efficiency by reducing:
  - lost time spent doing taxes.
  - the number of decisions households and firms make solely to reduce their tax payments.

reducing taxes

Graph of Supply Side Fiscal Policy in the Long Run



A → B → C : Best of both worlds!
- Higher GDP & lower price levels.

Even if the majority of the effect of tax rate cuts still come through aggregate demand tax reform has the potential to significantly increase real GDP in the long run beyond the increases that would otherwise occur.

The debate over the magnitude of supply-side effects can only be resolved through careful study.

- But even recent work by leading economists has conflicting conclusions.
- Hopefully, further study will bring estimates closer together.

While decreasing tax rates would likely result in more economic activity, the magnitude of the effect is debatable.

Workers → may not be able to increase hours worked
40-hour week.

Savings and investment
↳ might not be greatly affected by tax rates

Taxes and the Laffer Curve

We mentioned earlier that the United States has a progressive income tax.

Higher marginal income is taxed at higher marginal rate.

We also mentioned that inequality in the United States is <u>not</u> typically because of extreme poverty.

It is because our rich people are <u>very</u> rich.

Taxes, specifically changes in tax rates, can provide an interesting lesson in incentives.

Look at New Jersey as an example:

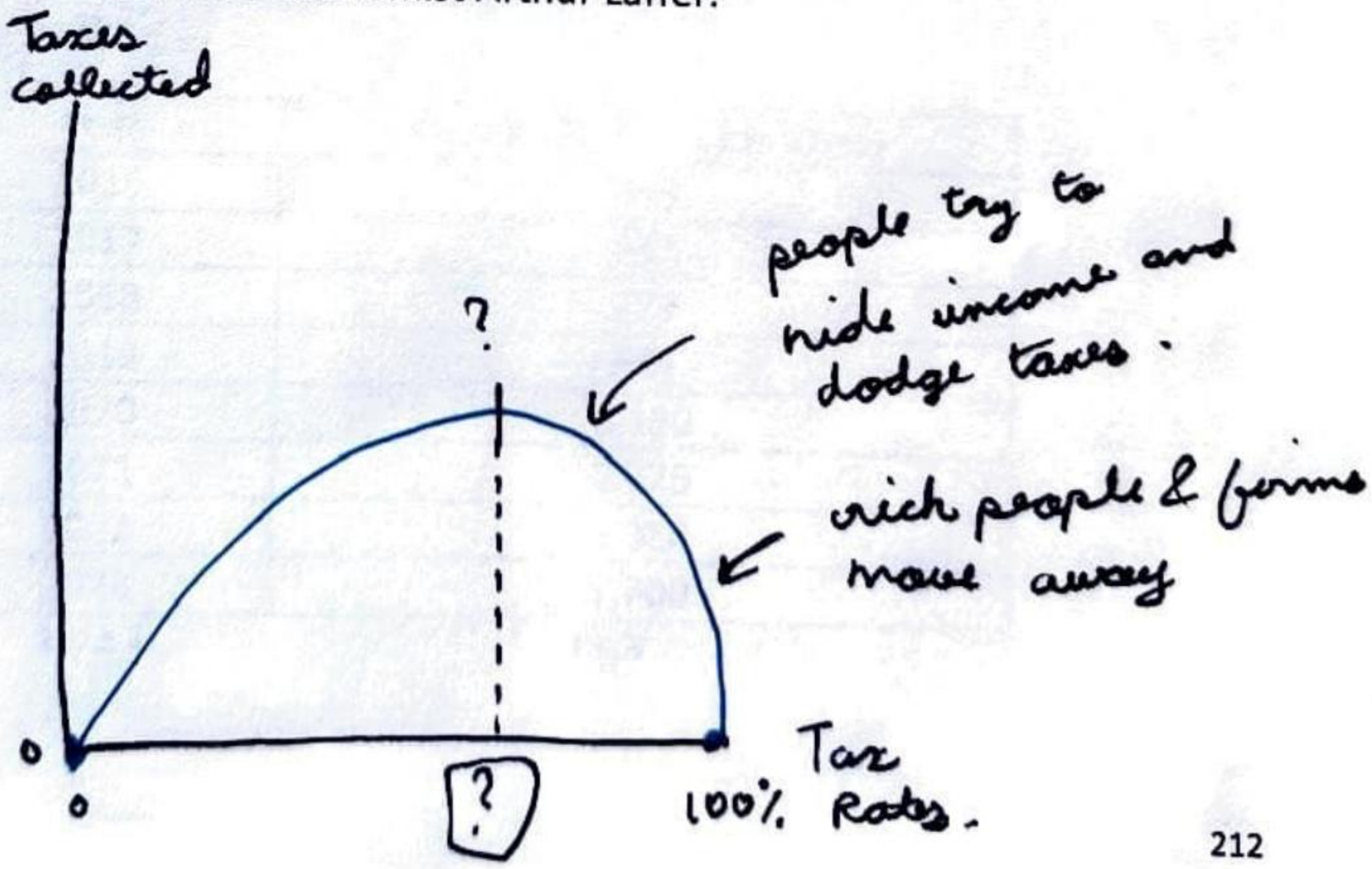
- 40% of the state's tax revenues come from state income tax
- Top marginal tax rate is 8.97%. The state has the 3rd highest tax burden in US
- Population is approximately 9 million

Tax collection information?

- One-third of New Jersey state taxes are collected from just 1% of population.
- Just 100 people contribute 5.5% of state tax revenues!

<u>Laffer curve</u>: A curve showing the relationship between tax rates and the total amount of taxes collected. Named after economist Arthur Laffer.

Laffer curve:



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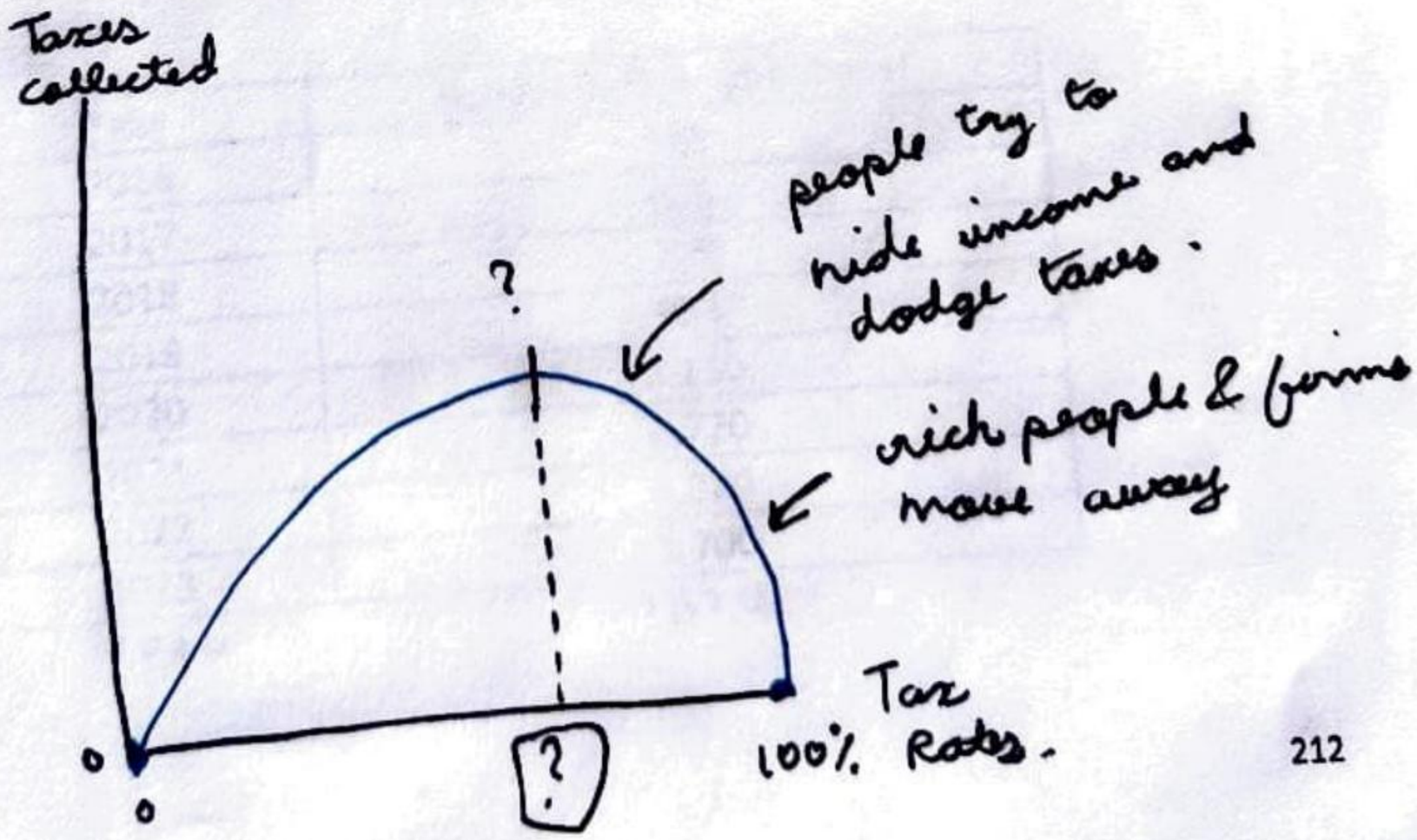

Chapter X: National Debt

What is the difference between deficits and debt?
Why is the national debt rising?
Who do we owe the debt to?
How might the growing budget deficits affect the future economy?
How can the debt be reduced?

Deficits vs. Debt

A deficit exists if the government spends more than it receives in taxes during a given period of time. How do the government spend more money than it brings in? It must finance deficits by borrowing money.

How does the government borrow money?

The government sells treasury securities to firms, households, and even other countries.

This includes treasury bills, notes, bonds.

- This borrowing is paid back with interest!

The federal deficit is a *flow* variable, one defined for a specific period of time, usually one year.

Year	Budget Deficit ($ billions)
2016	585
2017	665
2018	779
2019	984
2020	3,130
2021	2,770
2022	1,380
2023	1,700
2024	1830

Consequences of Higher Debt

How do higher deficits affect the economy in the short run?

If the economy is below full-employment,
- the deficit can close the recessionary gap.

If the economy is already at full-employment,
- the deficit can create an inflationary gap.

How do higher budget deficits affect the economy in the long run?
In the long run, higher government budget deficits have no effect on equilibrium real GDP per year. Ultimately, government spending in excess of government receipts

- Simply redistributes a larger share of real GDP per year to government - provided goods and services. This is a crowding out result.
- This likely slows future economic growth, and future generations will be poorer.

Large debts eventually become unsustainable, and we do not owe the debt just to ourselves. Over time, we will see that:
- Future U.S. residents will be taxed to repay principal and interest.
- Portions of US incomes will be transferred abroad.

However, it is possible for both present and future generations to be economically better off if
- Government expenditures are really investments.
- The rate of return on such public investments exceeds the interest rate paid on the bonds.

How can the Debt be Reduced?

Two deceptively simple solutions: Increase taxes and/or reduce government spending.

Chapter Y: Great Recession, Great Depression, and Macroeconomic Schools of Thought

What happened during the Great Recession?
What happened during the Great Depression?
What are some disagreements and different schools of thought in Economics?

Recession of 2008

Officially from December 2007 to June 2009, making it the longest recession since WWII

- Longer in length and deeper in effects than other recessions.
- Significant problems in the financial markets, similar to what happened during the Great Depression.

The banks we have been discussing so far are *commercial banks*, whose primary role is to accept funds from depositors and make loans to borrowers.

Traditionally, when a bank made a loan to a consumer, it would "keep" the loan (remember the loan is an asset in terms of the bank's balance sheet) and collect payments until the loan was paid off.

A very common type of loan to get from a commercial bank is a Residential mortgage loan.

In the last few decades, two important developments have occurred in the financial system:

1. Banks have begun to resell many of their loans rather than keep them until they are paid off.
2. Financial firms other than commercial banks have become sources of credit to businesses.

By raising funds from investors and providing them directly or **indirectly to firms and** households, these firms have become a "shadow banking system".

What made this "shadow banking system" different from commercial banks?

- These firms were less regulated by the government, including not being FDIC-insured.
- These firms were highly *leveraged*, relying more heavily on borrowed money;

– hence their investments had more risk, both of gaining and losing value.

Beginning in 2007, firms in the shadow banking system were quite vulnerable **to runs.**

- In spring of 2008, investment bank Bear Stearns avoided bankruptcy only by being purchased by JPMorgan Chase.
- In fall of 2008, investment bank Lehman Brothers *did* declare bankruptcy, after most of its clients pulled their money out.

After Lehman Brothers failed, a panic started, with many investors withdrawing their funds.

- Securitization ground to a halt; with banks unable to resell their loans, they stopped making as many.

– The resulting credit crunch significantly worsened the recession.

As previously discussed, the events of the 2008 housing crisis and resulting Great Recession led to many new government policies and changes in Federal Reserve monetary policy tools.

So was this just the fault of greedy banks and irresponsible lending practices? **Or the** fault of people buying huge homes they couldn't afford and then defaulting?

Banks did make some very risky loans. But why take on such risk?

- Because the government <u>incentivized</u> banks to make risky subprime loans to low-income homeowners.

The government sponsored enterprises (GSE) of Fannie Mae and Freddie Mac dominated the mortgage market and were highly leveraged. The US Government had quotas and built-in bailouts for these programs to make subprime mortgage loans. The quota for low-income loans was 56 percent in 2008! To meet these increasing quotas, Fannie and Freddie had to greatly reduce standards for loan underwriting.

A bank can get higher interest rates from less-creditworthy borrowers, but there is the risk they default on the loan. The government promised to cover banks if subprime loans got defaulted on.

- Strong incentive now to offer risky loans.

This distorted the entire market, and private lenders had to follow these GSE standards to even attempt to compete.

At the time of the financial crisis:

- More than half of all mortgages were subprime or low-quality.
- Federal government was backing 76% of them

Analyzing the Great Recession with AD and AS:

- Declining real estate values in 2007 due to an increase in mortgage defaults and a surplus of houses for sale. Recall that at this point, many mortgages were in securitized
- Falling real estate values therefore led to a systematic problem in the U.S. financial markets
- These markets exhibit international independence, and the problem became a worldwide problem
- Breakdown in the loanable funds market
- This scenario represents an <u>institutional</u> <u>breakdown</u>, which shifts ~~SRA~~ LRAS left.

Forward Guidance: Another (sort of) new tool

Since the early 2000s, the Fed has also been using Forward Guidance as a monetary policy tool. Forward guidance refers to central bank public communication about the likely future path of short-term interest rates, largely aimed at guiding financial markets.

Purposes of this:

- Increase Fed transparency
- Help people, firms, and banks plan for future
- Help banks accurately set long-term interest rates, reducing risk
- Prevent shocks in the economy or markets by avoiding sudden and unexpected changes in interest rate policy
- Clear expectations allow future policy to affect current economic behaviour.

"Monetary policy is 98% talk and only 2% percent action. The ability to shape market expectations of future policy through public statements is one of the most powerful tools the Fed has."

– Former Federal Reserve Chairman Ben Bernanke

We now have two models of the interest rate:

The loanable funds model (chapter 10)

Concerned with long-term real rate of interest. Relevant for long-term investors

- firms making capital investments
- households building new homes.

The money market model (this chapter)

Concerned with short-term nominal rate of interest, the Federal Funds Rate (FFR).

- most relevant for the Fed and money supply.

Usually, the two interest rates are closely related; an increase in the short term nominal interest rate will result in long-term interest rates rising also.

While institutional breakdowns affected aggregate supply, aggregate demand was also affected by two factors:

Decrease in wealth

- Real estate is often the single largest portion of an individual's wealth.
- Stocks lost one-third of their value in 2008.

Decrease in expected income

- People realized things were getting bad.
- Consumer spending falls during uncertainty, decreasing AD further.

Second quarter of 2007 (pre recession)

- Unemployment below 5%
- Real GDP growing at a rate of 3.6%

Last quarter of 2008

- Unemployment rate of 10%
- Real GDP had shrunk by 8.9%

2012: Recession officially over, but effects lingered

- Real GDP growing at a rate of less than 2%
- Unemployment remained at 8%

Government and Federal Reserve Actions

New tools?

- Fed tried many new monetary policy tools, such as quantitative easing (QE)
- QE: Central bank using new electronic cash to buy securities from private banks, greatly increasing reserves and money supply.

Beginning in fall 2008, the Fed took vigorous action under the Troubled Asset Relief Program (TARP):

- Providing funds to banks in exchange for stock
- Offering discount loans to previously ineligible investment banks
- Buying commercial paper for the first time since the 1930s

Commercial paper:

- unsecured, short-term debt issued by companies to finance their payrolls, payables, inventories, other short-term liabilities.

Interest rates during this time?

- The Fed dropped the FFR to 0.0% - 0.25%
- Kept it there until December 2016!!

Did all this help?

These combined actions appear to have stabilized the financial system,

- but full financial recovery still took many years (at least after 2013).

The Great Depression

While "Great Recession" and "Great Depression" sound similar...

- The Great Depression was much worse.

So what was the cause of the Great Depression? Most economists agree it was

- Faulty macroeconomic policy.

In the "Roaring Twenties" (most of the 1920s decade), things were going well, especially in the stock market. Because of this, there was a large influx of new investors, many with little or no trading or investing experience. The situation looked like this:

- People borrowing a lot of money
- Using borrowed money to speculate and buy securities (stocks and bonds)
- A large stock market bubble was created.

In 1928 and 1929, The Fed (still a relatively new entity at the time) increased interest rates and reduced the money supply in hopes of controlling stock prices, which policymakers thought were too high

- This brought on a panic among people.

Events of the Depression

Stock market crash on October 29, 1929

- "Black Thursday"
- After this, AD decreased due to people's lower expected future income.
- 1929-1932: Stock prices fell by almost 90%!

As financial panic spread, multiple bank runs occurred, and 9,000 banks failed from 1930 – 1933.

- Government and Fed had ability to lend to these banks, but didn't
  - (much debate at the time. The consensus was they didn't want to reward bad lending practices)
- Thus, money supply decreased further
- 1929-1933: money supply decreased by one-third

Smoot-Hawley Tariff Act (1930)

- Imposed high tariffs on thousands of imports.
- Set off a "trade war" and other countries taxed U.S. exports.

Higher Taxes (Revenue Act of 1932)

Hoover and Roosevelt raised taxes in attempts to balance the budget.

- This further reduced AD.

Numbers from the Great Depression

- Economy contracted by 30% from 1929 to 1933.
- It took seven years for real GDP to return to its pre-recession level
- Unemployment was 2.2% in 1929
- Unemployment was 25% in 1933
- The unemployment rate was 15% for almost entire decade of 1930s.

Effects were deep and long lasting. It was actually 2 separate recessions (1929 to 1933 and 1937 to 1938)

Most remarkable:

- Prices fell throughout decade
- At end of 1930s, price level was 20% lower than 1929.

Economists' views on the Depression today:

- Decline in prices indicates primary factor of the Great Depression was a huge decrease in AD, along with the decrease in the money supply.

"Regarding the Great Depression, ... we did it. We're very sorry. ... We won't do it again."
— Ben Bernanke, November 8, 2002, in a speech given at "A Conference to Honor Milton Friedman ... On the Occasion of His 90th Birthday."

The Fed's mistakes contributed to (and likely caused and worsened) the Great Depression.

Effects of Covid 19 on the Economy

"circuit breakers"

- March 9-13, 2020
  - Large stock market drops
  - mostly panic selling, as COVID not really in U.S. yet

Months after:
- Lockdowns, travel bans
- Hit leisure & airline stocks hardest.

LFPR and hours worked ↓ by a lot.

- Govt & Fed response?
  - → FFR dropped to 0.00-0.25%
  - → Set bank reserve requirements to 0%! Still there today.
  - → massive stimulus package

Recession? Yes.
Short & Sharp. 2 months

- Did we go too far?
  - Inflation hit 8.54%
  - Housing market overheated.
  - Unemployment programs probably too generous.

Effects of Covid 19 on the Economy

"Great Resignation"

- many used this to look for "better" or higher-paying job.
- but, many came back to work due to inflation!
- remote work, but this currently is being phased out by most places.

Bank failures in March 2023 related to fast i rate increases.

Silicon Valley, Signature & silvergate bank failed. They held long-term securities paying low i rates. Had to sell at a loss to buy new stuff paying higher i rates. People panicked.

→ FFR today: 4.25 - 4.5%

Disagreements in Macroeconomics

Classical Economists
Economy's adjustment toward Long-run equilibrium will happen naturally
- General belief: let the economy go

Keynesian Economists
Economic self-adjustment will be long and occur unpredictably with many delays
- More inclined to call for government interventions in the market.

Caution: these classifications (Classical and Keynesian) are given for simplicity. Particular economists might not fit comfortably in either camp, but these distinctions will help you understand the source of debate.

Classical Economics

Believe that the economy is self-correcting and generally believe in the AD-AS framework shown
- Economy returns to full employment in long-run
- Adjustments generally occur quickly.

Policies
- Pro-market, Laissez-Faire
- No significant role for short term government intervention.
- Policy: Focus on long-run growth (shifting LRAS) rather than AD.

Say's Law, and implications
- "Supply creates its own demand"
- Production generates the means and willingness to purchase other goods.

Keynesian Economics

The conditions of the Great Depression were bad by almost any measure and shook the view of Classical economics. It fundamentally changed people's views of economy and role of government. Could the economy correct itself? Keynesian economics is created.

John Maynard Keynes, British Economist
The General Theory of Employment, Interest, and Money in 1936
Offered a theory why cyclical unemployment may persist for longer time periods

Believed that wages did not adjust downward quickly during recessions due to contracts and salary expectations.
- Wages are sticky downward. They don't fall.
  - Prevents labor market equilibrium, we don't return to full employment.
  - Stay in recession.

Belief that an economy out of long-run equilibrium is not unusual.
- Short run can be improved by government intervention.

Major focus:
- The demand side is the source of instability. Fix that.

Government intervention would be needed in a prolonged recession to boost demand to restore economy to long-run equilibrium (potential GDP)
- government spending required as consumers and firms are nervous to spend.

Most famous quote by Keynes:
- "In the long run we are all dead".

Cause of sticky downward wages?

- Wage agreements by unions (1930s)
- Money illusion - people won't accept pay cuts, especially in a recession.

Keynesian view on savings

- Savings is not helpful in the short run since it reduces AD.
- The short run is a crucial time frame.

For Keynes,

- Fiscal policy more important than monetary policy.
- Govt spending should be used to correct volatile business cycle.

Simplified comparison summary

	Classical	Keynesian
Key Time Period	Long Run	Short Run
Price Flexibility	Prices Flexible	Prices Sticky
Savings	Crucial to Growth	A Drain on Demand
Key Side of Market	Supply	Demand
Market Tendency	Stability, Full Employment	Instability, Cyclical Unemployment
Government Intervention	Not Necessary	Essential

Milton Friedman and Monetarism

(Some information on the following pages comes from Investopedia)

Keynes became the leading economic voices in the first half of the 20th century.

Milton Friedman was one of the leading economic voices of the second half of the 20th century and popularized many ideas which are still relevant. Friedman's economic theories and emphasis on monetary policy and the quantity theory of money became known as monetarism, which refuted important parts of Keynesian economics.

Friedman's Critiques of Keynesian Economics

Friedman and others argued that Keynesian economics created a questionable justification for short-sighted politicians (wanting to get elected or stay elected) to
- run fiscal deficits and accumulate large levels of government debt.

Friedman's ideas brought about a renewed prominence on
- prices, inflation, incentives, and free markets.

This was a direct opposition to Keynes' focus on employment, interest, and public policy.

Friedman won a major intellectual victory after three decades of Keynesian policies ended in stagflation in the late 1970s, something establishment Keynesians thought was impossible.

Stagflation:
- Slow growth, high unemployment, high inflation.

Causes of this?
- Oil supply shock. 1970s had high unemployment, Keynesians thought high oil prices would cause growth. Didn't happen.

Friedman and Government Power

Friedman was a fierce critic of government power. He believed that

- Free markets operated more efficiently and morally.
- No bureaucrat could spend money as wisely as the taxpayer from whom it was taken.

To Friedman, government policy is created and carried out through force instead of voluntary trade, and this creates

- unintended consequences or perverse incentives.

This can lead to <u>government failures</u> which can be as bad or worse than market failures.
Example: 2008 financial crisis. Everyone blamed greedy banks for making bad loans.
However:

- Government incentivized risky subprime loans.

Quote from Friedman: "If you put the federal government in charge of the Sahara Desert, in five years there'd be a shortage of sand."

Other contemporary government failure examples Friedman often cited:

- Nixon's disastrous gas price controls.
- Government-created monopolies in transportation and media.

Friedman argued for deregulation in most areas of the economy, calling for a return to the free market of classical economics.

Friedman opposed tariffs and subsidies and argued for free trade.

He was a proponent of smaller government, and a slow, steady increase of the money supply in a growing economy.

Friedman and the Fed

The Federal Reserve's monetary policies from the late 1960s to the early 1980s led to a deep and severe recession in 1981 – 1982. The Fed effectively had unlimited inflation expectations, ruining their credibility with Friedman.

Friedman eventually (much later) gave some credibility back to the Fed.

Quote: "Inflation is always and everywhere a monetary phenomenon."

In stating this, he went against the intellectual standard of his time and made the quantity theory of money as a worthwhile economic principle.

In a 1956 paper titled "Studies in the Quantity Theory of Money," he found that in the long run, increases in the money supply raises prices but do not affect output.

Friedman's work proved wrong the simple Keynesian dichotomy on inflation, which asserted that prices rose from either "cost-push" or "demand-pull" inflation.

- His work also put monetary policy at the same importance as fiscal policy.

Other Notes about Friedman

More controversial theory of Friedman's:

- Low income families hurt by
  - Poor public schooling
  - Minimum wage
  - drug prohibition – called for decriminalization of all drugs.
  - welfare programs

Some of Friedman's philosophies, still powerful today:

- policies have unintended consequences.
- economists should focus on results, not intentions.

Friedman created a 10 episode TV series called "Free to Choose".
Many of these clips are viewable on YouTube.

Note: during the recession of 2007-2009, research suggests that the real-world multiplier fell to close to 1.

Why did that happen?

High uncertainty / banks didn't lend

also, people held more cash

The Money Multiplier Today

Since October 2008, the Fed has paid banks interest on their reserves. Thus, banks didn't have the incentive to loan out every penny they have, they can store it and receive interest payments from the Fed. This interest rate is called the IORB rate (Interest on Reserve Balances).

If the Fed decides to increase this rate, banks will choose to hold more reserves on hand or at the Fed and make fewer loans, reducing the money multiplier (see the previous page).

So the choice for banks and their liquid assets today is really:

- Loan to borrowers, who pay i rate.
- Save at Fed, get paid Fed's IORB i rate.

If the banks cannot find creditworthy borrowers, they will store more funds with the Fed.

In general, we can assume that the real-world deposit multiplier is greater than 1. So we conclude that:

1. When banks gain reserves, they make new loans, and the money supply expands.
2. When banks lose reserves, they reduce their loans, and the money supply contracts.

This is enough to establish the important relationship between banks and the money supply.

Higher Taxes

To close a deficit of $1.0 trillion, you would have to collect $6,500 from every worker in the US, rich and poor. (Good Luck)

Let's put a 100% marginal income tax on all income above $1 million?
It would generate a little less than $1 trillion.

Even if you put a 100% income tax rate on all money earned beyond $100,000 dollars earned (from everyone), we would only get $3.4 trillion in revenue. That sounds like a lot of money, but examine the size of the government's yearly spending:
$4.4 trillion in 2019, $6.8 trillion in 2021

Conclusion:
- We CANNOT just expect "rich" people to more income taxes to cover huge government spending.

What about some other current ideas being pushed by politicians, such as a wealth tax, or taxes on unrealized gains?

Wealth tax: probably a bad idea for many reasons:
- Greatly reduce long term investment
- takes away ownership of firms that people built, and other non-liquid assets.

Taxes on unrealized gains: - A ccounting is almost impossible
- What if losses occur later?

Reducing Government Expenditures

A very large portion of the federal budget is entitlements:
- Guaranteed benefits from Social Security, Medicare etc.

However, we cannot just cut these programs easily. There are legislated obligations. Sometimes called noncontrollable expenditures. Money gets spent each year without action or approval from Congress.
- It would take an act of Congress to change these expenditures.

To make a significant reduction in expenditures, entitlement programs would have to be revised. Problem with doing this?
- Politically difficult or impossible.

Assets (in billions of dollars)	
Reserves	$135
Loans	900
Securities	700
Buildings and Equipment	15
Other assets	550
Total assets	**$2,300**

Liabilities and Stockholders' Equity (in billions of dollars)	
Deposits	$1,000
Short-term borrowing	400
Long-term debt	360
Other liabilities	275
Total liabilities	**$2,035**
Stockholders' Equity	265
Total liabilities and stockholders' equity	**$2,300**

On a balance sheet, a firm's assets are listed on the left, and its liabilities (and stockholders' equity, or *net worth*) are listed on the right. The left and right sides must add to the same amount.

- Banks use money deposited with them to make loans and buy securities (investments).
- Banks' largest liabilities are deposit accounts.

Why are deposits a liability and loans an asset?

Remember that we are looking at this from the bank's perspective. The checking account balances do not belong to the bank. They belong to the bank's customers. The bank must be able to give that money back to the customer on demand.

Loans, on the other hand, represent money that people

- borrowed and owe back to the bank

A loan would be a liability to a *household* but is an asset for the bank.

How could a country go from a budget surplus to budget deficits?

- Higher govt spending has increased at a faster pace.
- tax cuts
- Great recession (2008) - both of these.
- Covid: Huge deficits from spending increases.

What if we required a balanced budget each year?

- We would lose some power to shorten recessions.
- Couldn't do expansionary fiscal policy (lower T, higher G or higher TR)

Who do we owe the Debt to?

Gross public debt: All federal government debt, irrespective of who owns it

However, some government bonds are held by government agencies, which means the funds are owed from one branch of the federal government to another.

- Essentially, the government owes the payments to itself.

Thus, we might prefer to look at...

Net Public Debt: Gross public debt minus all government interagency borrowing

- The government owes the debt to people, firms, or countries that own government securities.

If U.S. residents were the sole owners of the government's debts, the interest payments on the net public debt would go only to U.S. residents.

- We would owe the debt to ourselves.
- However...
  - 31% of net public debt is held by foreign residents, businesses, and governments.
  - Biggest foreign holder?
  - Japan! Why?
    - They have negative interest rates, decided to invest with USA instead.

How can a bank sell its loans?

A **security** is a tradable financial asset
Securities can be bought and sold in a financial market.

Securitization: The process of transforming loans or other financial assets into securities.

Process of securitizing a loan:

1. Banks grant loans to households, such as a mortgage
2. Loans are bundled into a tradeable financial asset called a security
3. Investors purchase the securities from the banks

The flow of payments on a securitized loan:

1. Households make loan payments to the banks
2. Banks take a processing fee for themselves on these loan payments
3. Banks send payments to investors

In the 1970s, secondary markets developed for **securitized** loans, allowing them to be traded, much like stocks and bonds.

The 1990s and 2000s brought increasing importance of non-bank financial firms, including:

- *Investment banks:* banks that do not typically accept deposits from or make loans to households; they provide investment advice.

  - also engage in creating and trading securities such as mortgage-backed securities.

- *Money market mutual funds*: funds that sell shares to investors and use the money to buy short-term Treasury bills and commercial paper (loans to corporations).

- *Hedge funds*: funds that raise money from wealthy investors

  - "sophisticated" (often non-standard) investments

If government spending is greater than revenues for the year, we have a budget deficit.

If government spending equals receipts, we have a balanced budget.

If government spending is less than receipts, we have a budget surplus

Since 1940, the U.S. federal government has operated with a budget surplus in only 13 years. What was the last year in which we had a budget surplus? 2001

What about debt?

Public debt is a <u>stock</u> variable.

- Debt is the total value of all outstanding federal government securities - Debt can be thought of as "all time" current sum of all deficits and surpluses.

What is the current National Debt?

About $36.7 trillion

Why is the National Debt Rising?

In the past 80 years,

- budget deficits have been more common than budget surpluses.

Remember that the shortfall of tax revenues below expenditures (deficits) have been financed with borrowing.

- Each year a deficit occurs, total public debt gets larger.

Very high rates of inflation—in excess of 100 percent per year—are known as *hyperinflation*.

- Money supply increases at a rate far in excess of the growth rate of real GDP.
- Governments want to spend much more than they raise through taxes, so it forces central bank to "buy" government bonds.

Recently, hyperinflation has occurred in Zimbabwe; during the 2000s, prices increased by (on average) 7500% per year.

- At that rate, a can of soda costing $1 this year would cost $75 next year, and over $5600 the year after that.
- Hyperinflation tends to be associated with slow growth, if not severe recession.

Some notes about this chapter:

Money is not the same as income or wealth, though the latter two concepts are often denominated in the former.

"Assets" and "liabilities" can be confusing, especially as a checking account deposit. An asset for the depositor is a liability for the bank. Remember in this chapter to consider things from the *bank's* perspective.

A T-account is a stripped-down version of a balance sheet, showing only how a transaction *changes* a bank's balance sheet.

Suppose you deposit $1,000 into your checking account at Bank of America.

Bank of America			
Assets		**Liabilities**	
Reserves	+$1,000	Deposits	+$1,000

When you deposit $1,000 into your checking account, it increases Bank of America's assets and liabilities by the same amount.

The currency component of the money supply decreases by the $1,000, since that $1,000 is no longer in circulation; but the checking deposits component increases by $1,000. Money supply has not changed yet.

But Bank of America needs to make a profit;

BoA will loan out $900 out of this $1000

Bank of America			
Assets		**Liabilities**	
Reserves	+$1,000	Deposits	+$1,000
Loans	+$900	Deposits	+$900

won't stay here long...

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The popularity of Friedman attracted other like-minded thinkers to the University of Chicago where he worked, ultimately creating the free-market-oriented school of thought called the "Chicago school of economics". When Friedman won the Nobel Prize in Economic Sciences in 1976, it marked the turning of the tide in academic economic thought away from Keynesianism and toward the Chicago School.

Friedman's Ideas

Friedman's first notable contribution in economics was his Theory of the Consumption Function in 1957, which theorized that a person's consumption and savings decisions are more greatly impacted by *permanent* changes to income, rather than changes to income that are short-lived.

This theory produced the permanent income hypothesis

- consumption is constant with short-term tax increases because we just save less.

This also leads to the concept of consumption smoothing, which predicts that people want to have a stable path of consumption over their lives.

- Borrow while young (if necessary)
- Save in middle of life.
- Spend savings after retirements.