



# Intermediate Macroeconomics

## 8. Money Supply

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In the [Money Supply](#) chapter in our *Introduction to Economics* course we discussed how money supply is measured and the role of the Federal Reserve System and banks in the control of money supply. The treatment of how a change in money supply affects the economy was very brief. Increases in money supply may result in price inflation but may also stimulate the economy through aggregate demand by lowering interest rates.

Our earlier presentation of the IS-LM model in this course highlighted how the effectiveness of money supply depended on the sensitivity of money demand and investment to changes in interest rates. In our IS-LM model the average price level was fixed. In this chapter we will take account of prices and inflation or deflation and the relationships between money supply and the economy. We could do this in the IS-LM model by adding prices as a new variable. With this new third variable we would also have to add a third sector such as labor supply and demand or a Phillips curve to solve the model. Unfortunately, simple algebra is no longer practical and we would have to introduce matrix algebra. Life in this course is too short. We will resort to a simpler approach that hopefully still captures the foundations and intuition of the different schools of economic thought.

We start with the long-run classical theory of money supply, which is based on the quantity theory of money. We then return to the Keynesian short-run model with a focus on money demand and advocacy of active fiscal policy over monetary policy. The classical macro foundation of flexible prices and interest rates reemerged in the 1950s and monetary policy again took center stage. But, we'll look at the analysis of Milton Friedman and the Monetarists who argued against monetary policy activism. Finally, we'll review the Great Depression of the 1930s and the lessons of fiscal and monetary policy failure.

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### 1. The Classical Theory of Money

Adam Smith gave birth to the classical economic philosophy of *laissez faire*--that the government should stay out of economic affairs. The economy left alone will be led as if by an invisible hand to full employment and maximization of wealth. Although Smith's critique of government policy was somewhat focused on barriers to international trade, this conservative philosophy carried through to perceptions of other government policies, including fiscal and monetary policy.

The classical foundation for the role of money supply in an economy goes back at least to David Hume in the mid-1700's. Money is used for transactions. More or less money in circulation simply translates to higher or lower prices.

"Money is not, properly speaking, one of the subjects of commerce; but only the instrument which men have agreed upon to facilitate the exchange of one commodity for another. It is none of the wheels of trade: It is the oil which renders the motion of the wheels more smooth and easy. If we consider any one kingdom by itself, it is evident, that the greater or less plenty of money is of no consequence; since the prices of commodities are always proportioned to the plenty of money, and a crown in Harry VII's time served the same purpose as a pound does at present."

David Hume, *Of Money* (1752).

The full text of this book is available from the [History of Economic Thought](#) web site.

## A. Quantity Theory of Money

The classical view of money is captured by the quantity theory of money. The quantity theory of money starts with a very basic accounting identity in equation 8-1.

$$M \cdot V = P \cdot Q \quad (8-1)$$

where,

M = nominal money supply

V = velocity of money

P = average price level

Q = quantity of goods and services sold

Let's use the U.S. economy as an example. The right-hand side of the equation can be seen as the definition of nominal GDP. The average price times the quantity of goods and services sold equals nominal GDP. In 2002, the total value of final goods and services sold to end users and measured as nominal GDP was \$10,446 billion. One measure of the quantity of money used to purchase those goods and services is the M1 (cash, checking accounts, and travelers checks), which averaged \$1,213 billion in 2002. Each dollar measured by the M1 must have been spent 8.6 times ( $\$10,446 / \$1,213 = 8.6$ ) to make the total value of purchases reported as nominal GDP. The number of times each dollar is spent during the course of a year is called the **velocity of money** (V).

There are of course some annoying features with this accounting. First, we measured transactions as nominal GDP. But there are transactions made in an economy that are not counted in GDP such as used goods. We ignore this problem by assuming total transactions are roughly proportional to nominal GDP.

Second, the M1 may not be the best measure of money used to make transactions. Some components of the M2 not included in the M1 can be used to support transactions. For example, savings and money market accounts (small time deposits) can now be easily transferred into checking accounts. Thus people may support transactions based on what is in their checking and savings accounts and not just checking. Because of this complication economists have gravitated towards the M2 as a preferred measure of money supply.

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**Quantity Theory of Money** - money supply x velocity of money = average price level x quantity of goods and services sold ( $M \cdot V = P \cdot Q$ ), where the velocity of money (V) is assumed constant.

**Velocity of Money (V)** - the number of times money changes hands over a given period of time.

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## B. Velocity of Money is Constant

This accounting identity is transformed into a theory by the assumption that the velocity of money is stable or constant. With velocity constant nominal money demand, M, is directly proportional to nominal GDP,  $P \times Q$ , which is also equivalent to national income. The demand for money is directly proportional to income. As income rises then money demand also rises.

Velocity is constant only if the demand for money is stable. In other words, the demand for money is predictable and affected only by income and not by any other variables, in particular interest rates. Money is held to make purchases. As people's incomes rise more money must be held to make purchases.

Figure 8-1 shows the velocity of money calculated by dividing nominal GDP by both the M1 and M2 measures of money supply. The velocity of money based on the M1 has been far from stable, more than doubling over the last 40 years. The measure of velocity based on the M2, however, has slowly cycled around its average 1.8. This figure reveals why the M2 has overtaken the M1 as the preferred measure of money supply in economic analysis because of its stability, at least over the long run.

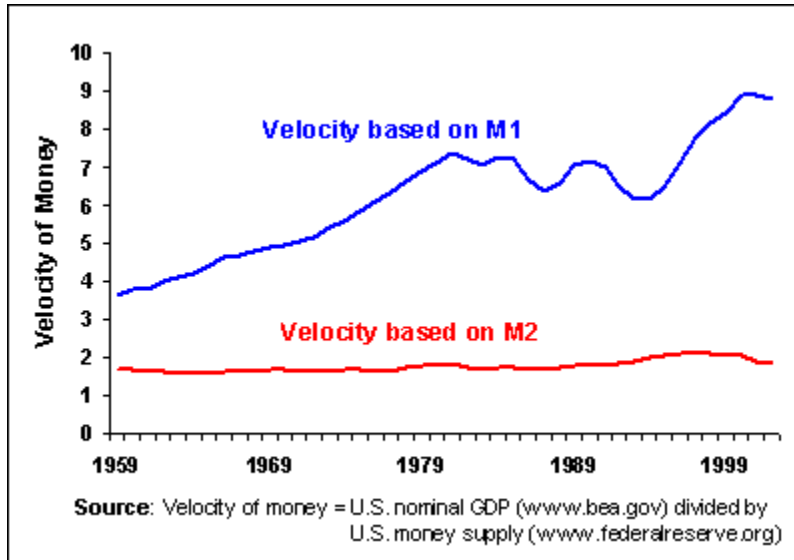


Figure 8-1. The Velocity of Money

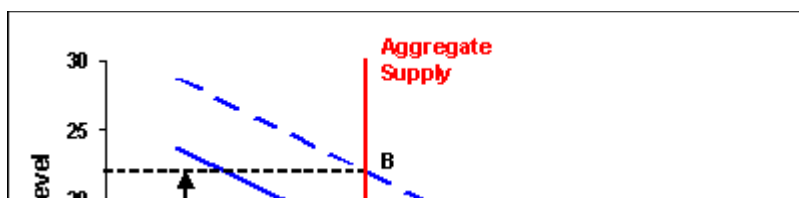
### C. Long Run Classical View

The quantity theory of money with velocity constant provides the foundation for the classical view of the **long-run** relationship between money supply and the economy. Put simply, money supply does not affect real output (Q) or employment. Changes in money supply translate directly to changes in prices (P) only. If the growth rate of money supply is too high we have inflation. If the growth rate of money supply is too low (or contracting) we have deflation. A stable economy requires a controlled growth rate in money supply that matches the long-run growth rate of the economy.

The quantity theory of money with the assumption that the velocity of money is constant reveals the proportional relationship between money supply and nominal GDP. With velocity (V) constant, a 10 percent increase in money supply (M) will lead to a 10 percent increase in nominal GDP ( $P \cdot Q$ ).

So how do we arrive at the conclusion that changes in money supply should lead directly to changes in prices (P) and not output (Q)? Of course the classical economists must assume that prices (and interest rates) are fully flexible. The classical economists also make the additional assumption that (over the long run) the economy is operating on its production possibilities curve at full-employment output (according to Say's Law supply creates its own demand). With output fixed at the full-employment level increases in money supply result only in increases in the average level of prices. If the quantity of money in circulation doubles then you have twice the amount of cash chasing the same number of goods and services. The price of those goods and services should also double.

The classical view of the relationship between money and prices and output is shown in the aggregate supply and demand graph in Figure 8-2. The aggregate supply curve is vertical at full-employment output. An increase in money supply from  $M_0$  to  $M_1$ , which causes an increase in aggregate demand (from  $AD_0$  to  $AD_1$ ), results in no change in output but simply an increase in the average level of prices. The economy moves from an initial equilibrium at point A to a new equilibrium at point B.



## Figure 8-2. The Classical View of Money Supply and Prices

Let's put a story behind Figure 8-2. Cash is held solely to make transactions. An increase in money supply puts more cash in peoples' hands. As people hold more money their desired level of transactions increases. The aggregate demand curve shifts to the right. However, because production is already at the full employment level (sometimes called "potential output") there is no increase in the quantities of goods and services provided for sale. Because we have more dollars chasing the same real output all we get is an increase prices.

## D. The Long-run U.S. Experience

We can see the long-run relationship between money supply and prices in the U.S. in Figure 8-3. When money supply is growing at about 2 percent per year prices are stable with zero inflation. A two percent growth rate satisfies the long-run growth of the economy with increasing population and real income. For every 1 percent change in money supply above or below this baseline there is an almost matching 0.8 percent change in the inflation rate.

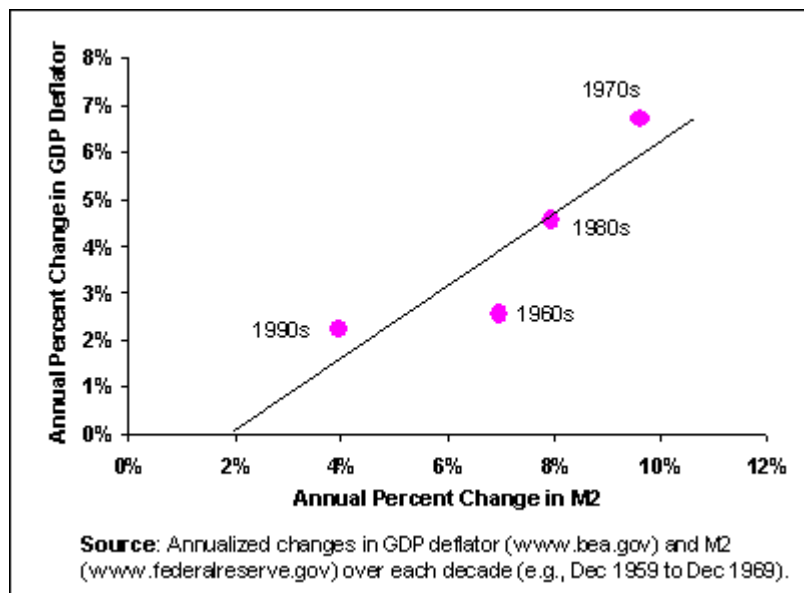


Figure 8-3. Inflation and Changes in Money Supply

Actually we should expect the relationship between changes in money supply and the inflation rate to be 1-for-1. For every 1 percent change in money supply above or below the baseline there should be a matching 1 percent change in the inflation rate. Differences between decades such as from population growth, changes in technology, and so on skew the picture presented by our limited sample. As Nobel laureate Milton Friedman once wrote, "inflation is always and everywhere a monetary phenomenon."

## E. Central Bank Independence and Inflation

The classical view should also enlighten us with regard to the importance of a central bank responsible for printing money that is *independent* of government influence. When a government wants to spend more than it is taking in through taxes, a natural motivation, it can do so only by either borrowing money by selling bonds or by printing money. If it is spending unwisely it becomes difficult to borrow the money. Let's say you make \$75,000 a year and want to borrow money to buy a \$200,000 house. This is quite reasonable and you should be able to do it. Now let's say you want to buy a \$1,000,000 house instead. What are your chances of getting a loan? Slim to none. Governments are treated no differently by investors. Unable to sell bonds a government must resort to printing money. An independent central bank may be the only constraint to irresponsible government spending.

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## 2. The Short-run Keynesian View

But what happens in the short run? Is economic activity and output temporarily affected by changes in money supply as the Federal Reserve Board appears to believe? When money supply changes can there be some short-run impact not only on prices (P) but also output (Q)? On this issue the classical quantity theory of money is silent. John Maynard Keynes went so far as to declare the classical approach to monetary theory useless.

"Now 'in the long run' this is probably true...But this long run is a misleading guide to current affairs. In the long run we are all dead. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us that when the storm is long past the ocean is flat again."

John Maynard Keynes, *Tract on Monetary Reform* (1923).

Keynes faced a dilemma. To escape the classical economic tradition of *laissez faire* where flexible prices and interest rates would restore the economy to full employment he advocated that prices and interest rates were "sticky". Prices and interest rates do not adjust quickly in the short run. This presented a problem. With prices, P, and the velocity of money, V, constant then an increase in money supply, M, would result in an increase in real output, Q. An increase in money supply could get you out of a recession. Keynes needed to show that the quantity theory of money was an invalid representation of money demand.

In our discussion of the classical quantity theory of money we suggested that the constant velocity of money was related to the transactions demand for money. Keynes emphasized a different motivation for holding money--the **speculative motive**. The amount of money people are willing to hold also depends on interest rates in bond and other asset markets (see the next chapter on [Money Demand](#) for a more comprehensive description of money demand theories). Velocity is no longer constant in Keynes' modified model of money demand. A change in money supply may be met not by a change in real output or even prices but by a change in velocity. People will hold onto an increase in money supply without spending any of the additional money. An increase in money supply leads to a decline in velocity with prices and output unchanged.

## A. Real Money Demand

Our description of the Keynesian approach must begin with an explanation of how money demand is measured. When we talk about money demand we are talking about **real** money demand. Real money demand relates to purchasing power. People demand not simply pieces of paper and coins made from cheap metals but the ability to purchase goods and services. The ability to purchase goods and services depends not only on the size of the money supply but also the average price level. Real money demand then is *nominal* money supply (e.g., the M1 or M2) divided by the average price level, or M/P. For a given nominal money supply an increase or decrease in the average price level represents a decrease or increase in the *real* money supply or purchasing power.

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**Real Money Demand** - desire for a level of purchasing power provided by money given the average level of prices, M / P. Also described as the demand for real money balances.

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The quantity theory of money can be rearranged (divide through by P and by V) to reveal the corresponding equation for real money demand:

$$\frac{M}{P} = \frac{1}{V} \cdot Q \quad (8-2)$$

where,

M / P = "real" money balances (i.e., purchasing power)

In this equation the demand for real money balances, M/P, is a function of the quantity of goods and services sold, Q. Hence, the *transactions demand* for money. Money is held to make purchases. As the quantity of purchases increases, say because of an increase in real income, then the demand for money also increases.

## B. The Speculative Motive for Money Demand

Keynes suggested that the demand for money may also be a function of the nominal interest rate. When interest rates are high people will want to hold less cash and increase their investments in interest-paying non-monetary assets. When interest rates are low you have an incentive to hold your financial assets as money and avoid the expense and risk of investing in low-paying interest non-money assets. For example, when the interest rate of a

typical bond is 2 percent you don't have much incentive to transfer money from your checking account into bonds. The costs of buying and selling the bond may outweigh the interest earned. When the interest rate is 10 percent the incentive is much greater. Money is just one of many financial assets you can own. The incentive to hold money rather than one of the other less liquid but higher returning assets depends on the interest rate.

The Keynesian speculative motive for money demand also introduces expectations and uncertainty over the future course of interest rates. The speculative demand for money rises from expectations that interest rates will rise in the future. For example, consider a 10-year T-bill that returns 4% interest per year. This T-bill pays out \$1,000 10 years from now and can be purchased for \$676 today (based on compounded annual interest). Compare that with a 10-year T-bill at 5% interest, which could be purchased today for \$614. As the interest rate increases the price of a T-bill declines. Why would you pay \$676 today for a 10-year T-bill when you can wait until interest rates rise and purchase it for a lower price? Those who expect the interest rate to rise will hold onto money and wait to transfer it to T-bills (or other securities or financial assets).

This Keynesian speculative demand for money (sometimes called the *liquidity preference theory of money*) implies the classical quantity theory of money demand presented as equation 8-2 above should be modified to include interest rates as in equation 8-3. The demand for real money balances,  $M/P$ , is a negative function of the nominal interest rate,  $i$ . A higher interest rate means lower money demand.

$$\frac{M}{P} = k \cdot Q - h \cdot i \quad (8-3)$$

where,

$i$  = nominal interest rate earned by alternative non-money assets

$k, h$  = coefficients

Notice that the coefficient on output has changed from  $1/V$  to  $k$ . While the notion of what  $k$  represents is similar to the inverse of velocity it is no longer identical because of the interest rate effect. In particular, **velocity is no longer constant**. A decline in the interest rate raises real money demand,  $M/P$ . If prices,  $P$ , are constant then nominal money demand,  $M$ , is also higher. If output,  $Q$ , is unchanged the velocity of money,  $PQ/M$ , must be lower.

### C. Keynes' Criticism of Monetary Policy

While Keynes advanced the macroeconomic theory of the role of interest rates and money demand he was skeptical of the efficacy of monetary policy. He did not believe that changes in money supply would have a significant affect on the economy, particularly during a recession or depression.

Keynes down played the role of monetary policy for several reasons. He believed that increases in money supply would not lower interest rates, particularly during an economic downturn such as a recession or depression. First, Keynes observed that during an economic downturn interest rates are likely to be very low already. He asked, how can money supply stimulate the economy by lowering interest rates when interest rates are already near zero and can't go any lower?

But what does happen when there is an increase in money supply? Keynes' speculative demand for money suggested that people decided to hold money depending not only on the current but also the expected interest rate of non-money assets. Low interest rates on bonds and a declining stock market provide little incentive for people to transfer their wealth out of money. But perhaps more important, expectations of future higher interest rates further reduce the incentive for shifting financial assets from money to interest-bearing accounts. Any increase in the money supply is simply held by the public. If the Fed wants to buy the T-Bill that I hold then fine. I'll take the cash and wait for interest rates to rise to buy the T-Bill back at a lower price. An increase in money supply can not significantly lower the nominal interest rate any further. This situation is called a **Liquidity Trap**.

In a liquidity trap households and firms are willing to hold any amount of money supplied by the Federal Reserve. A change in money supply results in no change in the interest rate. In our money demand equation (3) above, the coefficient on interest rate,  $h$ , is very large. Money demand is very sensitive to even small changes in the interest rate. In other words, a change in money supply is met by a change in money demand with only a small change in the interest rate needed to attain the new equilibrium.

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**Liquidity Trap** - when the interest rate is so low (and the price of bonds is high) people are willing to hold onto money expecting future interest rates to be higher (and bond prices lower). Changes in money supply have no effect on the economy.

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Second, Keynes argued that even if an increase in money supply could lower interest rates, aggregate demand would still be unaffected. Keynes did not believe that investment and consumption would respond to changes in interest rates. For example, when the economy is in a recession aggregate output is below full-employment output. If there is a decline in interest rates why would industry increase investment in plant and equipment when their existing capacity is under utilized? Similarly, households would be unwilling to invest in bonds or make large purchases by borrowing money when the economy is in a recession. Why invest in a bond when the company that issues the bond could go bankrupt. Why borrow money for a large purchase when your job is in jeopardy?

What if we are not in a recession? Keynes further argued that investment responded to changes in demand for a product and not interest rates. If a company is deciding to invest \$100 million or \$1 billion in a new factory that decision will depend on the forecast for demand for the product rather than a change in the interest rate. Some investment decisions may be affected by interest rates at the margin but the impact on total desired investment would likely be small.

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### 3. Friedman and the Monetarists

Once World War 2 closed out the Great Depression the limitations of the Keynesian model with sticky prices and interest rates and the liquidity trap became unsatisfying. Changes in money supply and interest rates did affect the economy. In the 1950s the Monetarists, led by Milton Friedman, rehoisted the flag of classical economic tradition with a focus on the short-run and emphasis on money supply, but with a twist.

The Monetarists did not go so far as to claim that fiscal policy was ineffective. They just believed it was inefficient and too often misused. The Monetarists showed that money does matter and is more important a policy tool than fiscal policy. But the twist comes in that they also believed active manipulation of money supply would likely be more disruptive than stabilizing. The most notable example of the disruptive element of monetary (and fiscal) policy that we cover is Friedman's "long and variable lags." Because of the long and variable lags the economy would be better off if we simply followed unchanging policy rules rather than use discretion to actively manipulate policy. It marked a return to *laissez faire*.

"There are four ways in which you can spend money. You can spend your own money on yourself. When you do that, why then you really watch out what you're doing, and you try to get the most for your money. Then you can spend your own money on somebody else. For example, I buy a birthday present for someone. Well, then I'm not so careful about the content of the present, but I'm very careful about the cost. Then, I can spend somebody else's money on myself. And if I spend somebody else's money on myself, then I'm sure going to have a good lunch! Finally, I can spend somebody else's money on somebody else. I'm not concerned about how much it is, and I'm not concerned about what I get. And that's government. And that's close to 40% of our national income."

Milton Friedman, interview with David Asman, Fox News Channel, May 21, 2004.

#### A. Long and Variable Lags

It is easy for us to suggest that we should use monetary or fiscal policy to counteract or smooth out fluctuations in the macro economy. But it is much easier said than done. Milton Friedman raised an argument against policy activism. Friedman argued there are "long and variable lags" between changes in policy and the response of target variables like unemployment and inflation. Lags prevent the effective use of monetary or fiscal policy in attempts to smooth economic fluctuations. We can describe three general categories of lags:

##### Recognition Lag.

To implement effective fiscal or monetary policy you must first recognize there is a problem and determine how big a problem it is. One of the difficulties we have in monitoring our economy is that we do not know what is happening when it happens. For example, preliminary estimates of quarterly GDP are not available until about 60 days after the end of the quarter. So, the economy may have started into a recession in July but we would not know until the GDP data came out at the end of November.

There is useful information that is more current. Monthly price indexes and unemployment rates are usually

reported two to three weeks after the end of the month. But, even though we may realize in late August that the July unemployment rate had increased this does not necessarily mean we should take immediate action. Policy makers cannot jump at the first hint of bad news. It may just be a hiccup caused by a hurricane from which the economy will quickly recover. Perhaps more important, economic data such as GDP, price indexes, unemployment, and so on come from surveys, which have a margin of error. We can't be certain that an increase in the unemployment rate in one month is accurate or even true. We may have to wait to see if the increase in unemployment continues into the following months or until data revisions are published.

It is also possible that policy authorities could take action before an economy deviates from the desired path. If economic conditions can be accurately predicted then a preemptive policy strike could be appropriate. Economic forecasting has been much maligned but it remains a very useful tool. For example, if we know reasonably well how and when the economy responds to rapid increases in the price of crude oil some policy actions might be taken to cancel the oil price impact.

Good policy requires good information. In a macro economy the information required to formulate policy is usually delayed and is imperfect. The lag between the beginning of a disruption to the economy and the time we recognize and can accurately assess the extent of the disruption can be significant. This recognition lag generally applies equally to monetary and fiscal policy. Solow and Kareken ("Lags in Monetary Policy," *Stabilization Policies*, Englewood Cliffs, N.J.: Prentice-Hall, 1963) in one of the first studies of the recognition lag, found the delay between disturbance and recognition averaged about 5 months.

### **Implementation Lag.**

Once an economic disruption has been identified it takes time to select and put a policy into action. The advantage here clearly to monetary policy. Changes in fiscal policy require legislative action by Congress and approval of the President. The process of implementing fiscal policy can be deathly slow and the final policy may in no means match the original prescription. Even after legislation is approved it can still take time to put into effect. Putting in place a process to issue tax rebate checks, reduce tax withholding rates, or obtaining competitive bids for increased government spending often appears to be very slow (except to those given with the task).

Monetary policy, on the other hand, has a much easier path. The Federal Reserve System's Federal Open Market Committee (FOMC) meets frequently in person and by phone to determine monetary policy. Once the need for monetary policy action has been recognized, the implementation lag can be short. Orders are issued to change the Federal Funds interest rate or buy or sell Treasury Bills. These policy actions can be taken as soon as a decision is made.

### **Response Lag.**

An economy does not respond immediately and completely to a change in money supply or new fiscal policy. Once a policy action has been taken the impact on the economy is spread over time. For example, the response of investment or consumption to a change in the interest rate is not immediate but takes time.

Here fiscal policy may have a slight advantage. Changes in fiscal policy such as an increase in government spending or cut in taxes would appear to act more quickly on national income than changes in interest rates or money supply.

With monetary policy there may be long and variable lags. The extent of the lags is difficult if not impossible to empirically identify because of the complexity of our economy. It is difficult to confidently attribute changes in economic conditions to a particular policy action because of the innumerable subsequent events that cloud the picture.

Glenn Rudebusch with the Federal Reserve Bank of San Francisco estimated the effectiveness lags in monetary policy using five different econometric forecasting models maintained by different organizations ("What Are the Lags in Monetary Policy?" FRBSF Weekly Letter, Number 95-05, Feb. 3, 1995). He found that monetary tightening or loosening has the greatest predicted effect on the growth of output during the first **eight quarters**, and that this effect is fairly distributed between the first and second years. A 1 percentage point increase in the short-term interest rate slows output growth by about four-tenths of a percentage point in each of the succeeding two years. Thus, two years after a tightening, the level of GDP is about three-quarters of a percent lower than it would have been otherwise.

## **B. Policy Rules Versus Discretion**

For a future class.

## 4. Fiscal and Monetary Policy and the Great Depression

The Great Depression of the 1930s and its aftermath (World War 2) was one of the most tumultuous periods of modern world history. The economic contraction of the Great Depression lasted 43 months, from August 1929 until March 1933. Following a slow recovery a recessionary after shock ran from May 1937 until June 1938. The start of World War 2 with Hitler's invasion of Poland in September 1939 finally provided the needed kick start to the world economies.

The start of the Great Depression was marked by the stock market crash of 1929. On Black Monday, October 19, 1929, the Dow Jones Industrial average fell by 13.4 percent. The market continued to fall the following day by another 11.7 percent. Over the two week period from October 10th through the 29th the stock market declined by 34.8 percent. But it was not the stock market crash that caused the Depression. On another black Monday, October 19, 1987, the Dow Jones industrial average fell by 22.6 percent with a 34.2 percent decline over the two weeks from October 2nd through the 19th. The market crash in 1987 did not lead to a recession much less a depression. Growth in real GDP hardly stumbled in 1987.

The Great Depression was not a consequence of investors fleeing the stock market but is a testimony to the outrageous mishandling of fiscal and monetary policy. We will look at these failures through the eyes of first a Keynesian and then a Monetarist.

**Table 8-1. Significant Events During the Great Depression**

Year	Month	Event	Unemployment Rate (%)	
			Overall	Trade Union
1929	Aug	Peak of business cycle. Economic growth starts to slow.	0.04	8.9
	Oct	Black Monday. Stock market crashes.	2.3	10.9
1930	Feb	Trade union unemployment hits first peak. Federal Reserve discount rate dropped from 5.0 to 4.5 percent	3.1	23.5
	Jun	Hawley-Smoot tariff bill passed.	3.8	19.6
	Dec	Bank of the United States (a private bank) fails.	11.9	19.6
1931	Sep	Great Britain abandons the gold standard.	15.8	35.0
1933	Jan	Hitler sworn in as Chancellor of Germany.	23.7	46.2
	Mar	Economy finally hits bottom. F.D.Roosevelt sworn in. Two days later, using a wartime statute passed in 1917, Roosevelt issued a proclamation closing every bank in the U.S. for four days.	25.4	n.a.
	Apr	US currency convertibility suspended (with gold @ \$20.67/oz) by Presidential Executive Order 6102. Export, all transactions and holding of gold forbidden.	25.5	n.a.
1934	Jan	The Gold Reserve Act of 1934 gives the government the permanent title to all monetary gold and halts the minting of gold coins. It also allows gold certificates to be held only by the Federal Reserve Banks, putting the U.S. on a limited gold bullion standard, under which redemption in gold is restricted to dollars held by foreign central banks and licensed private users. President Roosevelt reduces the value of the dollar by increasing the price of gold to \$35 per ounce.	18.8	25.4
1937	May	Economy hits peak. Starts new slide	11.2	n.a.
1938	Jun	Economy hits new bottom.	20.0	n.a.

Unemployment rates from National Bureau of Economic Research, Macro History Database, Chapter 8, Series 08292a (overall) and 08020 (trade union), <http://www.nber.org>. Low overall unemployment rate in late 1920s due to inclusion of workers not counted as part of labor force.

### A. Keynes' View of the Depression

Keynes saw the Great Depression as a case of inadequate demand made worse by government fiscal and trade policy. The economy started contracting in late 1929 and 1930 as nominal gross investment spending fell from \$16.5 billion in 1929 to \$10.8 billion in 1930. Personal consumption spending declined by \$7.3 billion over the same period. Total real GDP declined by 8.6 percent. Keynes advocated an aggressive government fiscal policy response of higher spending and lower taxes. The government failed to do so, increasing spending by only \$0.6

billion in 1930 over 1929. In fact, throughout 1930 the government ran a budget surplus! The government continued to take in more in taxes than it spent.

Private domestic spending continued to decline in 1931 with investment down an additional \$4.9 billion and consumption spending falling by another \$9.4 billion, contributing to the 6.4 percent drop in real GDP. The government didn't help as its spending dropped by \$0.1 billion. The government finally started running a budget deficit in 1932 of \$1.6 billion but not because it wanted to. Democrat Franklin D. Roosevelt campaigned in the 1932 Presidential election for "an immediate and drastic reduction of governmental expenditures by abolishing useless commissions and offices, consolidating departments and bureaus, and eliminating extravagances to accomplish a savings of not less than 25 percent of the cost of the Federal Government." Incumbent Republican Herbert Hoover likewise campaigned on a policy of sharp cutbacks in government spending.

The federal spending deficit of 1932 not only motivated politicians to call for spending cuts but also, to add gasoline to the fire, raise taxes. The Revenue Act of 1932 raised income tax rates, lowered personal exemptions from the income tax, and introduced a host of new excise taxes. The income tax rate on the lowest tax bracket was raised from 1.125 to 4 percent while the highest tax bracket saw rates increase from 25 to 63 percent. The list of new excise tax levies was long, including taxes on lubricating oil, malt syrup, brewer's wort, tires, toilet articles, furs, jewelry, automobiles, trucks, radio and phonograph equipment, refrigerators, sporting goods, cameras, firearms, matches, candy, chewing gum, soft drinks, and electricity (Tax History Project, <http://www.tax.org/Museum/1901-1932.htm>). Additional tax increases followed with the Social Security Tax Act of 1935 and a further tax increase on the wealthy (from 63 to 79 percent) in 1936.

The government not only raised income and excise taxes but also increased taxes on imported goods. The Hawley-Smoot tariff bill, which was passed in June 1930. Countries attempted to export their unemployment by raising barriers to imported goods. Of course as soon as Hawley-Smoot was enacted other countries retaliated, which contributed to the global economic contraction.

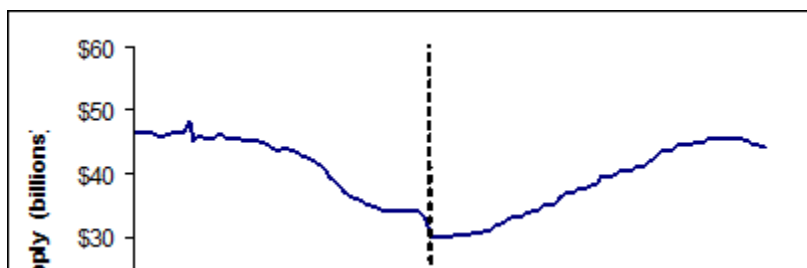
## B. Monetarists' View of the Depression

Monetarists looking back at the Great Depression saw a different lesson. The Depression was viewed as a failure of the Federal Reserve to maintain money supply and protect the banking system from failure. (For a comprehensive account of the Great Depression and the actions of the Fed read Milton Friedman and Anna J. Schwartz, *A Monetary History of the United States, 1867-1960*, Princeton, NJ: Princeton University Press, 1963.)

The U.S. Federal Reserve Bank was formed in 1914. In the era of the Great Depression the Federal Reserve and other Nations' central bankers had a naive view of money supply. They assumed that if banks limited their lending to sound business loans then the appropriate supply of money would be automatically generated. They believed the Depression was a result of banks making too many bad loans such as to stock market speculators. As these loans failed there seemed little the central bank could or even should do to save the day.

Banks started to fail. In 1920 there were 30,000 banks in the U.S. By 1933 there were only about 15,000 banks. The reaction of the Federal Reserve at the time causes shudders in economists today. In 1935 and 1936 the economy was beginning to recover. In an attempt to slow the rate of bank failures the Federal Reserve raised the bank reserves requirement. In August 1936 the reserve requirement was increased by one-half. For example, the reserve requirement for country banks was raised from 7 to 10.5 percent of deposits. By late 1937 the reserve requirement had doubled (to 14 percent for country banks). The higher reserve requirement forced banks to keep more cash in their vaults. Banks reduced lending and the economy hit the skids again. Between May 1937 and June 1938 the unemployment rate almost doubled from 11.2 to 20 percent.

The sad story of the performance of the Federal Reserve during the Depression can also be illustrated by the level of money supply shown in Figure 8-4. Between the stock market crash of 1929 and the bank holiday in 1933 money supply fell by almost 40 percent.



## Figure 8-4. Money Supply During the Great Depression

### C. A Combination of Policies

By the end of the 1930s the economies of the world began to recover through both stimulative fiscal policy and better money supply management. Paths taken were different, however. The Roosevelt administration is famous for among other things the New Deal and jobs programs that built new roads, dams, and other large-scale projects. The Federal Deposit Insurance Agency (FDIC), the Securities and Exchange Commission (SEC), and the Social Security Administration were formed. Hitler's Germany stepped up spending on its military-industrial complex. The Soviet Union established its program of five-year economic plans and state ownership of resources and businesses. Great Britain and the Scandinavian countries abandoned the gold standard for their money and resolved their problems with managing money supply. The ultimate solution was of course World War 2.

While the causes and solutions to the Great Depression are still debated today the picture that does emerge is neither strictly Keynesian nor strictly Monetarist.

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