

Section #7

Outline

1. Definition of GDP $\equiv Y = C + I + G + NX$
2. Money Supply / Demand
 - (a) Fisher equation
 - (b) Deflation
3. Fiscal Multiplier

1 Definition of GDP

In the “expenditure approach” to measuring GDP, we sum up the final uses of all goods and services in the economy, as shown in the following accounting identity:

$$Y = C + I + G + NX$$

where:

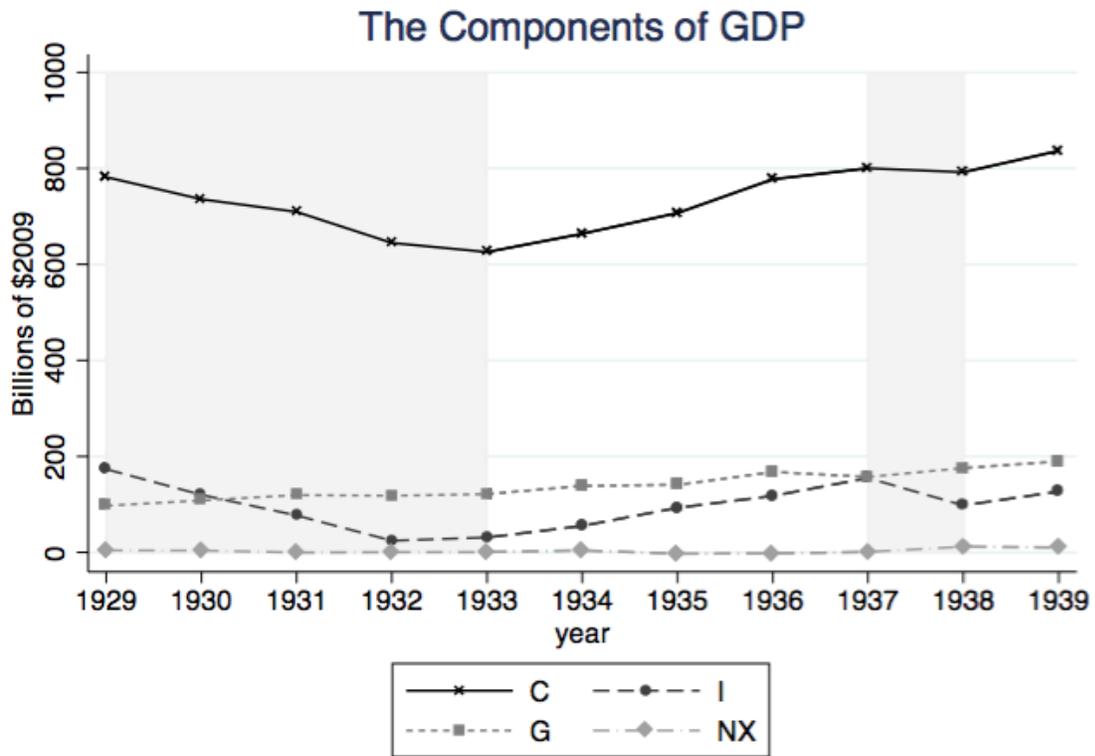
C - Consumption– goods and services purchased by consumers

I - Investment– sometimes called fixed investment, is the purchase of capital goods. It is the sum of nonresidential investment and residential investment.

G - Government– Refers to the purchases of goods and services by the federal, state, and local governments. (Note: It does not include government transfers.)

NX - Net Exports (Exports – Imports)– Exports are the purchases of U.S. goods and services by foreigners. Imports are the purchases of foreign goods and services by consumers, business firms, and the U.S. government.

In the first figure below, I plot GDP from 1929 to 1940. In the second plot, I plot each of the four components of the aggregate production function separately.



Group Questions:

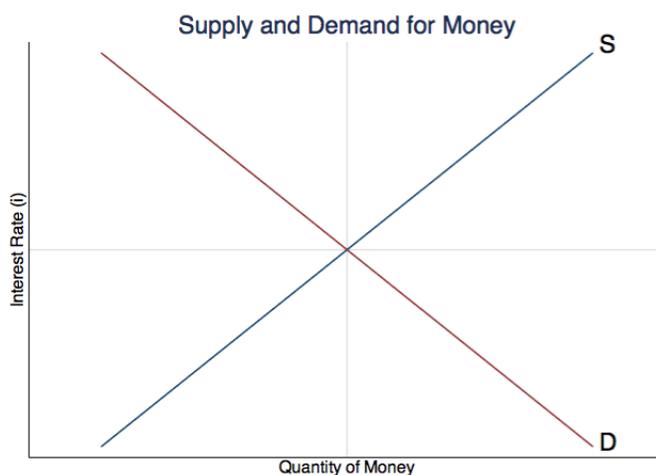
Q: What is the biggest component of GDP? What about the second biggest? Does the answer surprise you? Why or why not?

Q: In class, we talked about the Veterans' Bonus, which was eventually payed out in 1936. In what component of GDP does the Veterans' Bonus appear?

Q: What components of GDP fell the most in the Great Depression? Was the 1929-1933 Recession as bad as the "double dip" from 1937-1938 ? Was the component of GDP that fell the most in both recessions the same?

2 Money Supply / Demand

The figure below helps us think about interest rates and the supply and demand for money. Interest rates are an important determinant of the investment component of GDP. If interest rates are low, it is a relatively good time to invest compared with a time when interest rates are high. The y-axis shows the interest rate, and the x-axis shows the quantity of money in the economy.



As discussed in Ch. 23 in Walton and Rockoff, we can use this framework to think about the monetarist and Keynesian interpretations of the Great Depression.

Monetarist interpretation: Money supply shifted back, due to the actions of the Federal Reserve.

Keynesian interpretation: Demand shifted back, due to a collapse in consumer spending.

In both cases, the quantity of money falls (as it does in the actual data), but there are different implications for the interest rate.

Q: On the figure above, draw the shifts in the supply and/or demand curves according to each theory. What happens to the interest rate in each of these two interpretations?

2.1 The Fisher Equation & Deflation

So why can't we just look at the interest rate to see what happened, and settle the debate? Just examining the interest rate is a little more complicated than it first seems. To understand the interest rate, we must understand the **Fisher equation**, which tells us the relationship between nominal and real interest rates and inflation. This equation is given as follows:

$$i = r + \pi$$

where:

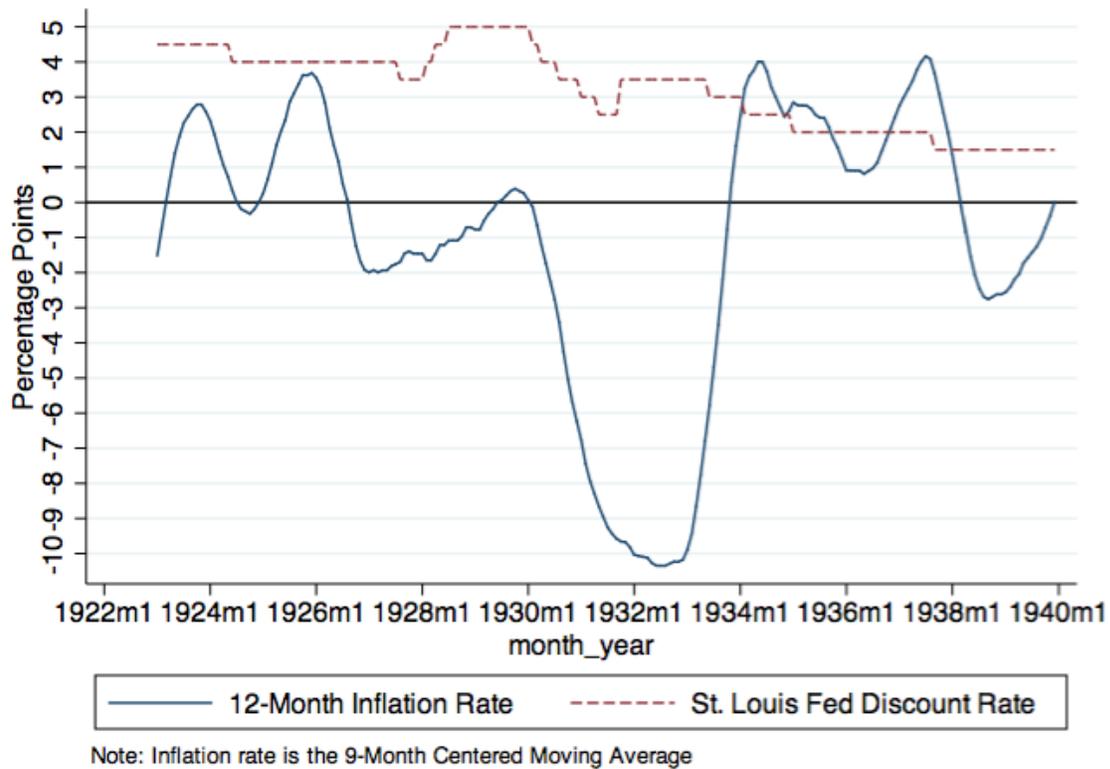
i - **nominal interest rate**, which is the quoted interest rate.

r - the **"real" interest rate**

π - **inflation**, defined as the change in the price level from one period to the next. If the price level declines, inflation is negative, also known as **deflation**

We can rearrange the Fisher equation to solve for the real interest rate: $r = i - \pi$.

In the figure below, I plot the **discount rate** of the Federal Reserve Bank of St. Louis and the month-to-month inflation rate. The discount rate is the rate that member banks can borrow money to meet temporary shortages of liquidity. The discount rate is set by the Federal Reserve and is an important tool of **monetary policy**.



Q: Using the Fisher equation, was the real interest rate higher or lower than the nominal interest rate from 1930-1933? Which view about the Great Depression does this support?

Q: What were real interest rates like in 1937?

3 Fiscal Multiplier

By 1937, real interest rates were very low, yet the economy was slipping back into Recession. When nominal interest rates hit zero (this is known as the “Zero Lower Bound”), the Federal Reserve effectively loses all power to influence the economy, a phenomenon known as the “Liquidity Trap.” When monetary policy is ineffectual, another option is **fiscal policy**. An important concept is the **fiscal multiplier**– the ratio of a change in national income to the change in government spending that causes it. All we have to do is

introduce one more equation, the **consumption function**, and we can derive a simple fiscal multiplier using what we've already learned.

The consumption function is simply an expression for the share of income that is consumed, and is given by the following equation:

$$C = a + bY$$

The coefficient on Y is a very important structural parameter, and is known as the **Marginal Propensity to Consume (MPC)** an additional dollar of income.

Let's return to our equation for GDP:

$$Y = C + I + G + X - M$$

Rearranging for C:

$$C = Y - I - G - (X - M)$$

Substituting the RHS for C in the consumption function:

$$Y - I - G - (X - M) = a + bY$$

Rearranging to have Y on the LHS:

$$\begin{aligned} Y - bY &= a + I + G + (X - M) \\ Y(1 - b) &= a + I + G + (X - M) \\ Y &= \frac{a + I + G + (X - M)}{(1 - b)} \end{aligned}$$

Now, let's think about how much Y would change if we changed G:

$$\frac{\Delta Y}{\Delta G} = \frac{1}{(1 - b)}$$

What this says is that if ΔG is \$1, then a \$ 1 increase in G increases Y by $1/(1-b)$. This expression, $1/(1 - MPC)$, is known as the fiscal multiplier.

Q: Assume the MPC is 0.5. How much do you expect output to increase if we build \$1 million dollars worth of infrastructure?

Q: Depression Macroeconomics: Putting it all together!

Using the equation $GDP = C + I + G + NX$, describe two different explanations for the severity of the Depression. Which economist (or school of economic thought) was the source of each? How do these two explanations differ? How do the policy implications of each explanation differ?