

Econ 1: Spring 2012: Problem Set 8

Due at the first section after the April 23, 2012 Lecture

1. Explain whether or not, why, and how the following items are included in the calculation of GDP:

a. Increases in business inventories.

Increases in business inventories are counted in the calculation of GDP so that new goods that are produced but go unsold are still counted in the year in which they are produced. Specifically, they count in I.

b. Fees earned by real estate agents on selling existing homes.

While the sale of existing homes is not counted in GDP (since the homes weren't produced during the year in question), the service rendered by real estate agents needs to be counted. Thus the fees earned by real estate agents does count in the calculation of GDP, even when the transaction brokered is for an existing home; the fees are included in C.

c. Social Security checks written by the government.

Social Security checks written by the government do not count in GDP, since they do not involve the production of any good or service. More generally, transfers (or transformations) of wealth do not count in the calculation of GDP.

d. Building of a new dam by the Army Corps of Engineers.

The goods and services purchased by the government to build the dam will count in the calculation of GDP (in G), but the value added over and above the cost of labor and materials is not counted.

e. An economist earning \$2,000 by giving a speech to members of San Francisco's private Commonwealth Club.

An economist earning \$2,000 by giving a speech to San Francisco's Commonwealth Club is producing a service, and the fee will be counted in the calculation of GDP (specifically, in C)

f. Interest that your parents pay on the mortgage they have on their house.

Like all interest paid by households and the government, interest on a homeowner's mortgage is not counted in the calculation of GDP since it is not assumed to flow from the production of goods and services.

2. Calculating real magnitudes:

a. When you calculate real GDP, do you do so by dividing nominal GDP by the price level or by subtracting the price level from nominal GDP?

When calculating real GDP you *divide* the nominal GDP by some measure of the price level.

b. When you calculate the real interest rate, do you do so by dividing the nominal interest rate by the price level or by subtracting the inflation rate from the nominal interest rate?

When calculating the real interest rate you subtract the inflation rate from the nominal interest rate.

c. Are your answers to the two parts the same? Why or why not?

The answers to these parts differ because calculating the real interest rate involves an approximation that economists use called the “growth of a quotient rule”, which states that the proportional change of a quotient is (approximately) equal to the difference between the proportional changes of its components. (It isn't precisely, mathematically true, but it's close enough for economists.)

The nominal interest rate is itself a quotient: it represents the ratio of how much money is owed to the original level of principle over some period of time. Similarly, the inflation rate is also a quotient—the ratio of prices at one moment in time to prices at an earlier moment in time. So in calculating the real interest rate—which is the nominal interest rate divided by the interest rate—the growth of a quotient rule tells us that we can save time by simply subtracting the inflation rate from the nominal interest rate. This rule doesn't apply when calculating real GDP because nominal GDP in a given year and nominal GDP in a base year are not themselves quotients.

3. Suppose that the appliance store buys a refrigerator from the manufacturer on December 15, 2010 for \$600, and that you then buy that refrigerator on February 15, 2011 for \$1000:

a. What is the contribution to GDP in 2010?

The refrigerator represents an increase in inventory for the appliance store. Since the appliance store paid \$600 for it the refrigerator will count for \$600 in the GDP of 2010.

b. How is the refrigerator accounted for in the NIPA in 2010?

The refrigerator represents an increase in inventory for the appliance store in 2010, so the \$600 that the refrigerator contributes to GDP in 2010 will be counted in I.

c. What is the contribution to GDP in 2011?

The contribution to GDP in 2011 is twofold: the final retail price of \$1000 and \$600 decrease in inventory. Since the decrease in inventory counts negatively, the net contribution to GDP in 2011 is \$1,000 - \$600 = \$400. The \$400 added to GDP in 2011 represents the value added by the retailer, whose services included storing, showcasing, and salesmanship.

d. How is the refrigerator accounted for in the NIPA in 2011?

The \$1000 final retail price is counted in C in 2011, while the -\$600 change in inventory counts in I (that is, it will make I smaller than it otherwise would be in 2011).

4. Solve for the equilibrium level of real GDP Y in the Keynesian framework

where: $Y = C + I + G$, $C = c_0 + c_Y Y$:

a. With $c_0 = \$5$ trillion/year, $c_Y = 1/3$, $I + G = \$5$ trillion/year

$Y_{eq} = (c_0 + O)/(1 - c_Y) = (5 + 5)/(1 - 1/3) = 10/(2/3) = 30/2 = 15$, that is, \$15 trillion/year

b. With $c_0 = \$4$ trillion/year, $c_Y = 1/3$, $I + G = \$5$ trillion/year

$Y_{eq} = (c_0 + O)/(1 - c_Y) = (4 + 5)/(1 - 1/3) = 9/(2/3) = 27/2 = 13.5$, that is, \$13.5 trillion/year

c. With $c_0 = \$5$ trillion/year, $c_Y = 1/3$, $I + G = \$4$ trillion/year

$Y_{eq} = (c_0 + O)/(1 - c_Y) = (5 + 4)/(1 - 1/3) = 9/(2/3) = 27/2 = 13.5$, that is, \$13.5 trillion/year

d. With $c_0 = \$4$ trillion/year, $c_Y = 1/2$, $I + G = \$4$ trillion/year

$Y_{eq} = (c_0 + O)/(1 - c_Y) = (4 + 4)/(1 - 1/2) = 8/(1/2) = 16$, that is, \$16 trillion/year

e. With $c_0 = \$4$ trillion/year, $c_Y = 1/2$, $I + G = \$6$ trillion/year

$Y_{eq} = (c_0 + O)/(1 - c_Y) = (4 + 6)/(1 - 1/2) = 10/(1/2) = 20$, that is, \$20 trillion/year

5. Suppose that the government has decided that it wants to boost the equilibrium level of real GDP Y , is working within the Keynesian framework, and is deciding whether it will try to do this by increasing the level of G , of I , or by increasing c_0 .

What is the principal argument for preferring to attempt to increase G rather than I or c_0 ?

It may be the case that due to uncertainty or other factors households, firms, and the foreign sector are unwilling to increase present spending, so that increasing G is the only realistic option. Government spending that goes to infrastructure or other factors that might improve productivity may increase future growth throughout the economy.

That said, changing government is slow, it may imply higher interest rates that would crowd out investment spending and reduce net exports, and excessive deficits may erode confidence.

What is the principal argument for preferring to attempt to increase I rather than G or c_0 ?

Increasing I by lowering the interest rate is the easiest and fastest to implement, is the least politicized, and has the least adverse side effects.

That said, nominal interest rates cannot be lowered below 0%, and once the interest rate is as low as it can go this ceases to be an effective tool. Low interest rates also may unintentionally inflate an asset bubble in investment spending, such as the overproduction of housing in the middle of this last decade.

What is the principal argument for preferring to attempt to increase c_0 rather than G or I?

Attempting to increase c_0 is less interventionist and may involve fewer problematic distortions than increasing G or I.

On the other hand, raising c_0 may be difficult due to credibility problems. (“No, really! This time we promise things will get better soon!”) Raising c_0 may involve unsustainable levels of private debt.

How should a government working within the Keynesian framework implement these plans?

To boost G the government simply needs to borrow and spend more money. It borrows money by selling Treasury bonds to individuals, firms, or foreign governments.

To boost I the government should reduce the interest rate, which will make projects with lower rates of return attractive enough to invest in. Also, measures that instill confidence in the future will help firms decide that it’s safe and wise to make investments in the present.

To boost c_0 the government should try to convince households and firms (through rhetoric, data, or legislation) that better times are coming soon, which with luck may become a selffulfilling prophecy.

Also, the government can make credible commitments to control future deficits (through austerity measures, increased taxes, or other budgetary reforms) if one of the causes of unease is uncertainty regarding the government’s future ability to finance its debt.

Finally, the government can target a higher inflation rate in an attempt to get consumers to move some of their planned future consumption spending into the present.

6. Minskyites tend to say that both Keynesians and monetarists are wrong-----at

least in dealing with deep depressions. From their perspectives, attempts to boost

either the economy's money stock or the planned amount of (risky) investment in building firm capacity are likely to fail to relieve depression.

What is the Minskyite story for why normal monetarist attempts to cure depression by printing money are unlikely to be completely successful?

Normal open market operations simply swap one safe asset—short-term government bonds—for another—cash. Since it doesn't change the total quantity of safe assets, it does nothing to relieve the excess demand for safe assets that is at the root of the problem.

What is the Minskyite story for why normal Keynesian attempts to cure depression are unlikely to be completely successful?

Inducing businesses to issue more bonds or consumers to save less would be effective if the problem were an excess demand for risky bonds—then increasing the supply of bonds or decreasing the demand for bonds via reduced savings would make households and businesses eager to switch spending back from building up bonds to buying currently-produced goods and services. But the problem is the enormous risk premium between risky and safe assets—it is the shortage of safe assets that causes the cutback in spending. And attempts to boost corporate investment or reduce consumer savings will simply drive the risk premium higher and affect the shortage of safe assets little if at all.

7. Classify each of the situations below into one of our three types of depression:

monetarist, Keynesian, and Minskyite:

a. Very low interest rates on short-term and long-term government bonds, but high interest rates on risky corporate bonds and low stock prices.

When there is a divergence in the interest rates of safe and risky bonds the downturn fits neither the Keynesian nor monetarist types. Instead, this would be an example of a Minskyite downturn, where there is excess demand for safe, high-quality assets.

b. Very high interest rates on short-term and long-term government bonds, high

interest rates on risky corporate bonds and low stock prices.

High interest rates on all bonds means that the price (and thus the underlying demand) for bonds is low. Thus the demand for money (cash) is high. This is an example of a monetarist downturn.

c. Very low interest rates on short-term and long-term government bonds, low

interest rates on risky corporate assets and depressed stock prices.

Low interest rates on all bonds means that the price of bonds is high, which happens when the demand for bonds is high. This is an example of a Keynesian downturn.

d. Very low interest rates on short---term government bonds, high interest rates on

risky corporate bonds, low stock prices, and high interest rates on long---term

government bonds.

When there is a divergence in the interest rates of safe and risky bonds the downturn fits neither the Keynesian nor monetarist types. Instead, this would be an example of a Minskyite downturn, where there is excess demand for safe assets (in this case, short-term government bonds). The high interest rate for long-term government bonds may reflect a feeling that the government may not be able to finance its debt obligations over the long term, so that longterm government bonds are not a sufficiently high-quality asset.