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1. **What is the equation representing the relationship between fiscal policy and inflation? Why is it the case that decreases in tax revenue may end up leading to inflation? Briefly explain.**

The equation relating government spending and taxes with inflation is given by:

$$G = T + \Delta B + \Delta M$$

Where  $G$  represents government spending,  $T$  represents tax revenue,  $\Delta B$  represents the change in the government debt, and  $\Delta M$  represents the change in the stock of money.

The lower government revenue from taxes is, the more the government will have to finance its spending through increased borrowing or printing money (which leads to inflation). If the government opts for money increases for providing the alternative required funding the economy will undergo inflation increases.

2. **We talked in class about how potential GDP represents the long-run trend of GDP. Basically, this represents the level of GDP if the country is operating at its long-run, sustainable potential.**

- a. **What happens if potential output is calculated as being much higher than it actually is? Briefly explain.**

If potential output is calculated as being much higher than it actually is, actual GDP is more likely to be lower than potential, and this may lead policymakers and the central bank to believe that the economy needs some stimulus. If the economy is really close to or at its potential, then trying to stimulate the economy will just lead to inflation because it is already operating near its capacity.

- b. **What happens if it is calculated as being much lower than it actually is?**

This is the opposite situation of the case above. In this scenario, it is more likely that the economy will be above potential and steps might be taken to cool the economy. If the economy was really at its potential and not above it, actions to cool the economy may cause a recession.

3. **Suppose you take out a loan from a bank at a certain nominal interest rate. If the rate of inflation decreases, who benefits? You, the bank, or does no one benefit? When answering, you can assume the inflation lowered and become negative. Briefly explain.**

In general, higher inflation decreases the value of money. If you were paying back \$100 a month, then that \$100 is worth less over time because inflation increased and thus the same amount of money can buy fewer goods now. Here we have the opposite case. Money is able to buy more goods due to a decrease in prices if inflation lowered and became negative. Thus, money became more valuable than when it was borrowed meaning that the bank would benefit and the borrower is worse off.

**4. The decrease in housing prices was one of the leading causes of the depth of the Great Recession.**

- a. How did the increase in interest rates by the Federal Reserve (in order to fight inflation) eventually lead to more people losing their homes? Briefly explain.**

A rise in interest rates led to higher payments for those people paying mortgages that adjusted with interest rates. As interest rates increased, the payments become larger, leading to more people not being able to afford the payments and their house.

- b. How did the fact that a larger proportion of loans were 'subprime' loans lead to magnifying the severity of the situation outlined in part 'a'? Recall that subprime loans represent loans being made to people with lower credit scores, higher debt, lower income, etc.**

Subprime loans are usually given to people that have lower income, more payments on other loans, and lower credit scores, hence the name (these are not "prime" lenders). This means they will have a harder time paying back loans and are more likely to default on loans. If loan payments increase, then, on average, this cause those people with subprime loans to default at a higher rate. This higher "riskiness" is accounted for in the payment and rates of their loans, thereby increasing even further the cost of debt of these loans, and being a large proportion of total lending, deteriorating aggregate financial conditions severely.

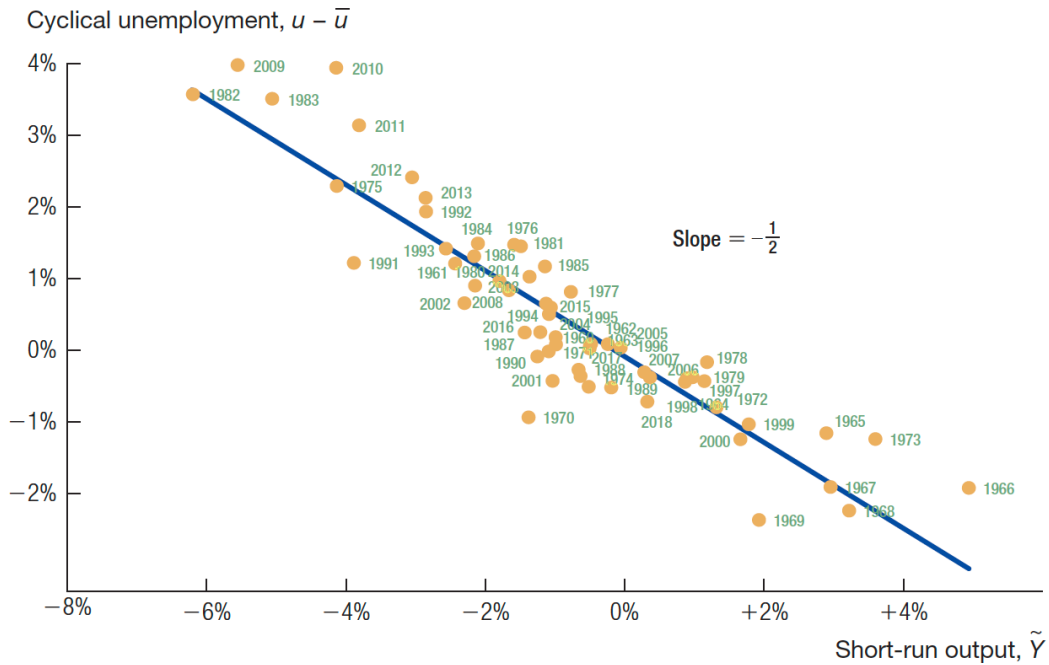
**5. Suppose that GDP grew at 3% last year. Does this mean that  $\tilde{Y}$  is 3%? Briefly explain using the formula for how  $\tilde{Y}$  is calculated.**

$\tilde{Y}$  represents the percentage deviation of actual (short-run) GDP from the long-run trend and can be calculated with the following equation:

$$\tilde{Y}_t = \frac{Y_t - \bar{Y}_t}{\bar{Y}_t}$$

If  $\tilde{Y} = 3\%$ , this means that GDP was 3% above  $\bar{Y}$  which is potential GDP/output. Given (long-run) trend GDP also should have grown with respect to its past value, it follows that total GDP (which includes the short-run fluctuations and the long-run component) had to have increased by more than 3%.

6. The following graph shows the relationship between a measure of unemployment (y-axis) and short-run output (x-axis).



Source: FRED. U.S. Department of Commerce.

- a. How is it possible that there are negative values on the x-axis and y-axis? Briefly explain.

Both unemployment and output are measured as *deviations* and not their exact value. The unemployment rate is measured as the deviation from the natural rate of unemployment, so a negative value just means that unemployment is below the natural rate. A negative value on the x-axis means that output is below its long-run trend and not actually negative.

- b. If Okun's law represents the relationship between unemployment and output, why are there years where the values are not on the line representing Okun's law? Is the law wrong? Briefly explain.

The main idea behind Okun's law is that the more people are working, the higher output will be, and vice versa. This is why most of the points are close to the line. That said, output may increase/decrease due to factors unrelated to unemployment and unemployment may increase/decrease due to factors unrelated to output. This would make the points deviate from the line, which represents a linear relationship between unemployment and output.