

Macroeconomics A; EI056

Quiz

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1 Nature of macroeconomics

Question: What are the main features that distinguish macroeconomics from microeconomics?

Answer: The differences falls under two broad lines. The first is in terms of the questions asked. While microeconomics considers the problem faced by a few agents, taking the overall environment as given, macroeconomics considers the working of the entire system, including how the actions by agents affect the environment they face. General equilibrium is thus at the heart of macroeconomics.

The second line is that macroeconomics is essentially a dynamic analysis (some models are static, but these are the exception) that considers trade-offs between the present and the future (for instance how much to save instead of consuming). From the dynamic focus, the central role of expectations follows. When outcomes today are affected by future variables, optimizing agents form an opinion about these variables. This opinion is affected by the conduct of policy makers, and thus communication about future policies is a potent tool in affecting current outcomes.

2 Drivers of volatility

Question: What drives short-run output fluctuations? Look at the question from the point of view of the usages of output (i.e. how do we use what we produced) and the inputs.

Answer: From the usages point of view, output is used for consumption (private or by the government), investment, inventories, and next exports. In other words, what we produce can be eaten, invested in building capital, put on a shelf for later (inventories), or sold abroad.

The biggest driver of volatility is investment, which is nearly three times as volatile as output. To understand this, realize that investment (a flow) is used to build capital (a stock). Small changes in stocks lead to big changes in flows. For instance, let's assume that capital is equal to 100 and each year 10 need to be invested to keep it at that level (to make up for capital wearing out, we'll see that more in the growth lecture next week). Let's also assume that output is equal to 40. Now

consider that because of a recession firms want to lower the capital stock by 2 percent to 98. This is done by investing only 8 instead of 10, which is a 20 percent fall in investment. This brings output down from 40 to 38, a 5 percent drop in output. Thus, the flow of investment being small to the stock of the capital, small adjustments in capital lead to big movements in investment.

A similar story applies to inventories (it's a bit more subtle). The inventories in GDP are not inventories themselves (a stock), but the accumulation of inventories (a flow). GDP growth then reflects the change in inventory accumulation (the change in flows). In other words, for growth to be lower, we must put less on the shelf than we use to. Putting a constant amount on the shelf each quarter is associated with constant GDP (i.e. zero GDP growth). Inventory accumulation is a tiny share of GDP, but accounts for a fair share of quarter-to-quarter growth volatility.

Turning to inputs, output is produced using capital, labor, and productivity (i.e. how good we are at using labor and capital). Of course these are complementary inputs: being good at using a machine is beside the point if one has no machine to work with. In terms of volatility, capital is not very volatile. This is not surprising: a large reduction of the capital stock would imply a destruction of machines, as opposed to merely a reduction in investment. The labor input shows more volatility, as labor is a flow while capital is a stock (the stream of services from capital is a flow). Productivity shows the biggest volatility of all. Understanding business cycles thus requires going beyond the fluctuations in labor and capital, and understand the movements in productivity. Bear in mind that productivity here is not to be taken literally. What it is the movements of output that we cannot explain with movements in the capital stock and labor (a measure of our ignorance in other words). It can be literally productivity, but can also be mis-measurement. For instance, if we keep the stock of machines constant but push them less hard, and thus produce less, this will look like a fall of productivity even though we have not gotten any worse at what we do. We'll discuss this more in the lecture on real business cycles.

3 The Phillips curve

Question: What is the Phillips curve? Has it remained stable through time? Why?

Answer: The Phillips curve is the inverse relation between unemployment and inflation. If the central bank adopts an expansionary monetary policy, this leads to some inflation. It also stimulates the economy and reduces unemployment.

The relation has not proved stable. In the 1970's it shifted up, meaning that a given level of inflation was associated with higher unemployment. It shifted back down in the 1990's. The key aspect is the role of expectations. If government try to systematically surprise firms with higher inflation to boost outputs, firms are going to figure this out after a while and will just understand that they operate in a higher inflation environment. All we get then is inflation with no gain in employment. This is (roughly) what happened in the 1970's.

If the central bank on the other hand does not even try to surprise firms with higher inflation, they realize it and adjust to operating in a low inflation environment. We then get low inflation with no increase in unemployment. This is the situation of the 1990s. We will analyze the role of

expectations in the unemployment (output) and inflation levels in the lectures on monetary policy.

4 Money and inflation

Question: What is the link between money and inflation?

Answer: The key link is the quantity theory, $PY = MV$, that views the value of output in two mirroring ways. The first is that the value of output is the quantity of output times the price level (inflation is the change of the price level through time).

The second angle focuses on the transactions through which output is sold, and the value of output is then the amount of cash times the speed at which it changes hands. Consider an economy made by two agents, Jack and Susan. Jack produces 100 francs worth of goods that Susan wants, and Susan produces 100 francs worth of goods than Jack wants. The value of output is then 200 francs. There are many ways that these can be transacted. One way is to give Jack and Susan a 100 franc bill each. Jack uses his bill to buys all the goods he wants from Susan, who does the same. The quantity of money is then 2 bills = 200, and velocity (the number of times the bills change hands) one. Another way is to give Jack and Susan a 10 franc bill each, so the quantity of money is 20. Jack uses his bill to buy 10 francs worth of goods from Susan, who uses her bill to buy 10 francs worth of Jack's good. Once this is done, Jack uses the bill he got from Susan to buy another 10 francs worth of goods from her, and she does the same with the 10 franc bill she received from Jack in the first stage of transactions. They keep doing that 10 times until they have bought the goods they want. A given bill then changes hands 10 times, so the quantity of money (20) times the velocity (10) is equal to the value of output.

With this in mind, consider what happens if we double the quantity of money, but keep velocity constant. This will double the value of output. It must then be that either we produce more (which happens, especially in the short run) or raise the price of goods (which is what happens in the long run). Printing money then leads to inflation. Notice that this is for a constant velocity. If velocity falls, because everyone puts money under the mattress (essentially what is going on in the current crisis), then keeping the price stable requires the central bank to boost the quantity of money. This is why the massive money creation since the end of 2008 has not lead to inflation. It will if it remains in place once people start spending the money that's under the mattress.

5 The growth of finance

Question: What is financial deepening?

Answer: Financial deepening is the increase in the value of financial assets relative to GDP. This is a major development since the 1980's. It reflects asset prices, but also financial innovation. Consider car purchases for instance. Without credit, people have to accumulate the cash before buying a car. Not everyone can do that, so the cash holdings are not that large relative to GDP. With credit people can buy cars right away, and more will do so. The value of cars bought is then higher. For car owners, the value of the car is offset by the value of the debt. The debt however is

held by banks, so it's a financial asset for them. We then get a higher value of financial assets to GDP.

For macroeconomists, this development stresses the need to think of the connection between macroeconomics and financial markets. This had not been such a key point until recently, but the crisis has put the aspect center-stage in the research agenda.