Macroeconomics A: EI056

Quizz

Cédric Tille

Class of November 6, 2023

1 Evidence of effects of policy

Question: What do we need to be careful about when assessing how monetary policy affects output and inflation?

What is the evidence in the US case?

Answer: We have to be careful in establishing causality. Simply looking at correlations between growth (or inflation) and the interest rate is not enough. Imagine that the central bank reduces the interest rate when a recession occurs, and it takes time for the interest rate to sustain output. We would then see falling output and a falling interest rate, and conclude that reducing interest rates is detrimental. But this gets the causality wrong, as the interest rate is reduced in response to the recession.

We thus need to have a situation where the interest rate moves on its own (a monetary policy shock). This can be done using some VAR with output, inflation, and the interest rate. As in any VAR, we need to put restrictions to identify causality. One way is to impose sign restrictions (for instance an interest rate shock has no long run effect on real GDP, or it has no immediate effect of inflation).

Another approach is to rely on high frequency movements, for instance looking at minute by minute long-term interest rates in a day where the central bank holds its meeting. The message from the meeting is published at a precise time, and if long-term rates move at that time, this means that the market has learned something unexpected (a shock). These daily shocks can then be put in a quarterly VAR.

Yet another approach is to make a qualitative judgment based on the discussions among policy makers. This is the narrative approach of Romer and Romer.

All these approaches show that a contractionary monetary shock (an increase in the interest rate that is not motivated by changes in growth or inflation) reduces real activity, as well as inflation with some delay.

2 Strategic complementarity

Question: Explain the concept of strategic complementarity.

Answer: Strategic complementarity implies that an agent's pricing decision is affected by the price of his competitors. An agent's price setting reflects two considerations: first, he wants to raise his price when his marginal cost is higher; second he wants to keep his price fairly close to the price of his competitors, so as not to lead to large movements in demand.

Consider a shock that reduces wages by 10 percent. Based on cost alone, the agent would like to lower the price by 10 percent. However, if he is the only one doing so, this would lead to consumers switching to his product, and thus boost demand. If the technology is characterized by decreasing returns to scale, the rise in demand increases cost. This induces the agent to lower the price by less than 10 percent, in order to limit the movement in demand.

If the wage shock affects all agents, others will also lower prices. Eventually, everyone will lower the price by 10 percent. How fast this happens depends on how quickly agents get a chance to adjust their prices.

3 Demand for varieties of goods

Question: n class we derived the demand for brand i, and the consumer price index as:

$$C_j = \left[\frac{P_j}{P}\right]^{-\theta} C \qquad ; \qquad P = \left[\int_0^1 [P_j]^{1-\theta}\, dj\right]^{\frac{1}{1-\theta}}$$

Explain these expressions in terms of economic intuition.

Answer: The demand for brand j reflects two factors. The first is the agent's overall consumption: when a consumer buys a bigger basket, he tends to buy more of everything. The second is the relative price of brand j: when the brand is more expensive than other brands (or more exactly the average brand), the consumer shifts his purchases towards the cheaper brands. The sensitivity of consumption to the relative price reflects the elasticity of substitution θ. If brands are close substitutes (θ is high), the consumer is willing to substantially reallocate his purchases from one brand to another.

The price index is an average of prices across brands. It is not a simple arithmetic average (although if we take a linear approximation, it is). Instead, the index represents the cheapest way there is to buy one unit of the consumption basket, i.e. when the consumer optimally allocates consumption towards cheaper brands.

4 New Keynesian Phillips curve

Question: What is the New Keynesian Phillips Curve? Explain intuitively the various elements that enter this relation.

Answer: The NKPC reflects the pricing rule used by firms. Firms set their prices in line with marginal costs. They however cannot reset the price each period, but face a random chance of being able to reset. When a firm can reset its price, it then knows that the price may remain in effect for a while. The price is thus set in line with an average of current and future expected marginal costs, with the weight on future costs reflecting the probability that the price will still be in effect in that period.

A firm's optimal pricing rule links the price it sets to its current and future marginal costs. After some algebra, we can express this relation in terms of macroeconomic variables. Specifically, the current inflation is a function of the current output gap and future expected inflation. The output gap reflects marginal cost: if the economy operates above the level that it would reach under flexible prices, production costs are high as workers ask for high wages to compensate for the extra effort, and high output translates into high costs when the technology exhibits decreasing marginal returns.

Future expected inflation reflects the fact that a firm who gets a chance to adjust its price today may not get another chance for a while. Also, a firm wants to keep its price close to the prices of its competitors. If the firm expects that tomorrow its competitors will increase prices, it takes the chance of raising its price today as it is not sure that it will be able to do so tomorrow.

5 Output gap

Question: What is the output gap?

Answer: The output gap is the difference between the actual output and the one that would prevail today if all prices could adjust. The gap is a measure of inefficiency due to sticky prices. If all prices adjust, the economy reaches an efficient allocation, called the natural output. Note that the natural output can be volatile if the economy faces volatile shocks. The central bank's goal is to fight the inefficiency generated by the inability of all prices to move right away. If monetary policy can bring the economy to the output level that would prevail under flexible prices, then it would completely get around the friction of sticky prices, which is the best it can hope for.

6 Gain from commitment

Question: What is the new gain from commitment in the New Keynesian model?

Answer: The gain is different from the one due to time inconsistency. In that case, the central bank aims for an output level that is above the natural one, and thus has an incentive to generate unexpected inflation. Agents foresee that and all we end up with is high expected and actual inflation, and no extra output. The usual gain of commitment is that the central bank can avoid the costly inflation by committing to resist its temptation.

The new gain is different. It focuses on the ability to affect future expectations. The NKPC shows that expected future inflation affects current inflation. Under discretion, the central bank cannot affect expected inflation (no one believes its promises) and thus must conduct the stabiliza-

tion policy entirely through current inflation. Countering an output shock then calls for inflation and a recession (negative output gap).

With commitment on the other hand, the central bank can promise to deliver inflation as a set function of the shock. It thus affects the NKPC not only through current inflation and the current output gap, but also through future inflation. Lowering current inflation can then be done partly through future inflation, and thus reduces the need for a current recession. In other words, the central bank has an additional tool, future inflation, that it can use today, and thus can limit inflation pressures without generating too big a recession (in technical terms, it has a better "sacrifice ratio").

7 Expectations and policy

Question: Economists often point to monetary policy being all about expectations. Explain how this is the case in the framework presented in class.

Answer: The Euler relation shows that the output gap today, which affects inflation, is affected by the real interest rate today, but also by future real interest rates. The central bank can then steer the economy not only by moving the interest rate today, but also (and in fact mostly) by communicating what it expects to do with interest rates tomorrow.