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Suggested Answers to Second Midterm for Paulo and Federico

1. (22) Question: Suppose you observe two different countries in which the degree of market power held by firms is the same, but in one of the two countries the power of unions is much greater. Apart from the rate of unemployment, all other variables impacting on wage and price setting are assumed to be identical. Given the framework developed in this course, which of the two countries can be expected to have the higher rate of unemployment on average?

Answer: During a period when the various factors impacting on price and wage setting decisions are constant, the average unemployment rate corresponds to the natural rate of unemployment, which is determined by the intersection of the wage setting equation with P^e replaced with P , and the price setting equation. The fact that market power in the two countries is the same signifies that the markup used by the firms in each country to set prices above costs (primarily, wages) is the same. That the level of prices over wages in the two countries is the same is equivalent to the notion that the real wage in the two countries is the same. (That is, in a graph with W/P on the vertical axis and the unemployment rate on the horizontal axis, the price setting equation is the same horizontal line for each country.) This implies that the outcome, in terms of the real wage obtained, of wage bargaining in the two countries is the same. But, other things the same, more union power implies a *better* bargaining outcome for workers (i.e., union power is something that pushes *up* the z variable in the F function that helps define the wage setting equation.) To ensure that the bargaining produces the same outcome, despite the better bargaining power of the workers, the unemployment rate must be higher in the country with the stronger bargaining position. It must be higher by enough to exactly cancel the impact of the greater union power.

2. (22) The unemployment rate in Europe in the 1980s and 1990s rose from below the US rate to way above it.

- (a) Why do some people think this observation poses a challenge to the NAIRU hypothesis? Is it the mere fact of the rise in the unemployment rate itself that is the problem for NAIRU, or is it something else?
- (b) What is the hysteresis hypothesis that has been proposed to explain the observations? Explain the sense in which hysteresis constitutes a very different view about unemployment than the NAIRU.
- (c) At a practical level, what is at stake for Europeans in the choice between the NAIRU and hysteresis hypotheses? Explain carefully.

Answer: (i) The European unemployment data poses a problem for the natural rate hypothesis that is a part of NAIRU. According to the natural rate hypothesis, the unemployment rate moves reasonably quickly (in the medium run) to the natural rate, which is presumed to be unaffected by the factors that enter the AD curve. Thus, according to the NAIRU, expansionary monetary or fiscal policy have a neutral impact on unemployment and output in the medium run. In the absence of factors that change the natural rate itself, the average unemployment rate over say a decade should be roughly equal to the natural rate. So, from the perspective of NAIRU, one is forced to interpret the sharp and persistent rise in unemployment in Europe as reflecting some sort of institutional or other factor (e.g., a shift in μ or z) that changed in the early 1980s and 1990s and raised the natural rate. The problem is that many economists feel that such a factor cannot be found.

(ii) These economists have embraced the *hysteresis* hypothesis instead, according to which unemployment in Europe remains high because it was high in the early 1980s, when it was pushed up by restrictive monetary policies designed to battle inflation. Because of its assumption that the history of unemployment matters for the current rate of unemployment, the hysteresis hypothesis represents a very different view than the NAIRU about the determinants of unemployment. Under the hysteresis hypothesis, a shift in the AD curve can raise the unemployment rate for a very long time.

(iii) Thus, at a practical level, the hysteresis hypothesis suggests that the Europeans could reverse the shift to persistently high unemploy-

ment that started in the 1980s by adopting a loose monetary (e.g., high M) and fiscal policy (e.g., high G and/or low T). According to the NAIRU hypothesis, such a policy shift would have no impact on the high average unemployment rate. It would simply leave Europeans with higher prices in the case of loose monetary policy and a smaller composition of output going to investment in the case of loose fiscal policy. According to the hysteresis hypothesis loose fiscal and/or fiscal policy would do the trick for unemployment. Evidently, much is at stake here.

3. (22) Suppose there is a rise in the demand for real balances at any given level of income and rate of interest. (That is, with $L(i) = \bar{L} - li$, $l > 0$, there is a rise in \bar{L} .) Explain the effects of this on i , Y , P , I , u in the short and medium-run. Be sure to describe the dynamic path taken by the economy in the short run. Make the basic logic of your argument clear through the appropriate use of graphs or algebra. Most importantly, please do your best to convey the basic economics at an intuitive level.

Answer: The basic economics of what happens in the short run is as follows. The rise in the demand for real balances raises the rate of interest immediately. This has a depressive effect on desired investment spending. With the reduction in desired investment, aggregate planned spending falls and unintended inventory accumulation occurs. Firms react to the inventory accumulation by cutting back on production. The cutback in production has effects in (i) the wage and price setting parts of the economy, and in (ii) the money market. In (i), by raising unemployment, the fall in output reduces the bargaining power of workers who get lower wages. With lower wages firms set lower prices. The fall in the price level has the effect of shifting the LM curve back to the right. The direct effect on the money market of the fall in output in (ii) is to reduce the demand for money, which causes the rate of interest to fall off the peak it jumped to with the initial jump in \bar{L} . The fall in the rate of interest is helped by the right-shift that occurs in the LM curve as the price level falls.

The IS-LM diagram of the situation would depict an initial upward jump in the LM curve with the rise in \bar{L} . The rate of interest initially

jumps to the new intersection of the IS and LM curves. Then, as output falls, the economy ‘rides down’ the now right-shifting LM curve until it hits the intersection with the unchanged IS curve. This is the short-run equilibrium. An alternative way to depict these effects graphically is with a left shift in the AD curve. The short-run equilibrium occurs where the new AD curve intersects with the unchanged AS curve at a lower P and Y .

Actual prices are now below expected prices. As the latter start to fall, the AS curve shifts down. This is because lower P^e results in reduced wage settlements, which in turn takes the pressure off prices. The lower price level raises the quantity of real money balances and so puts downward pressure on the rate of interest. The downward pressure on the rate of interest stimulates investment spending, resulting in unanticipated inventory decumulation. This in turn leads to a rise in output and a fall in unemployment. The picture in the IS-LM diagram is that the LM curve shifts right with the rise in P . The economy now rides down the stationary IS curve as the LM curve shifts right and the medium run equilibrium is achieved when the LM curve intersects the IS curve at the level of output associated with the natural rate of unemployment. In terms of the P, Y diagram, the AS curve shifts right and the economy rides down the stationary AD curve until the natural rate of output is restored.

Thus, the medium run impact on output and the interest rate of the rise in money demand is nil. All that happens in the medium run is that the price level fall enough so that real balances rise by enough to satisfy the increased money demand. In effect, the economy ‘manufactures’ the increased real balances being demanded by generating just the right fall in the price level. The medium run impact on the unemployment rate is also nil: that rate was at the natural rate at the start of the experiment and that’s where it ended up too.

4. (22) In 1968, President Johnson got a temporary tax increase passed by the Congress. Based on the experience with the 1964 tax cut, everyone expected the tax increase to exert significant pressure on aggregate demand. To everyone’s surprise at the time, the 1968 tax increase actually had very little effect. Later, the episode came to be viewed as

an example of the importance of private expectations in determining the economic effects of a government policy action.

What is it about private sector expectations that could account for the relatively strong effect of the 1964 tax cut and the weak effect of the 1968 tax increase?

Answer: A central factor in determining the response of the economy to a tax change is the consumption function. In our model, a tax change affects the economy via its impact on consumption. A tax change that is not accompanied by a change in consumption has no effect at all in the short and medium run of our model. In the late 1960s, economists used a function like $C = c_0 + c_1(Y - T)$ to model households' consumption decision. According to this function, a household's consumption response to a change in taxes (or income) is the same, regardless of whether that change is perceived to be temporary or permanent. Most now think this oversimplifies. An increase in disposable income that is perceived to be permanent is expected to result in a greater rise in consumption than an increase that is perceived to be temporary. The 1964 tax cut was perceived by everyone as being relatively permanent, so the data generated during and after that period reflect the strong response of consumption to tax changes, i.e., those data suggest a large value for c_1 . When economists analyzed the expected impact of the 1968 tax increase, they used this high value of c_1 to predict that the effects of the increase would be large. In fact, households expected the tax change to be temporary and so hardly let it change their consumption. Because of this, the tax increase had relatively little impact on the economy.

5. (12) What is the time consistency problem in monetary policy? What can be done to alleviate the problem?

Answer: there is a time consistency problem in monetary policy due to the existence of the expectations-augmented Phillips curve. Under these circumstances, there is an incentive to adopt a stimulative monetary policy today (x) to achieve a low unemployment rate now, while assuring everyone that this will not be repeated in the future (y). Such an assurance is important to prevent π^e from rising. A higher π^e implies that, just to keep the unemployment rate unchanged, the

monetary authority has to follow a loose monetary policy indefinitely. It is easy to see that the policy, $x, y, y, y, y\dots$ is not time consistent. When the next period comes around, the optimal policy once again is $x, y, y, y, y\dots$. But this contracts ('is inconsistent with') the policy previously announced for the current period, which called for y , not x . In practice, the problem is dealt with by making the central bank independent and appointing central bank governors who strongly dislike inflation - either because they have staked out such a position publicly in the past, or because (as in New Zealand) their employment contract stipulates penalties for violating inflation targets.