Econ 434 Professor Ickes

Fall 2008

Homework Assignment #3: Answer Sheet

This assignment is due on Thursday, November 20, 2008, at the beginning of class (or sooner) .

1. *Consider the graphical model of the gold standard. Analyze graphically (be sure to distinguish impact effects from long-run effects. Assume the economy started in full equilibrium) what happens to the price level and the stock of gold if:*

   (a) *there is a fall in foreign income.*

   brief answer A decrease in foreign income reduces exports so the flow supply of gold will decrease. This causes the stock of gold to fall. Given the demand for gold the relative price of gold must rise. Under the gold standard this requires the price level to fall. This makes us more competitive. Once the price level rises sufficiently the flow supply of gold is once again equal to the flow demand and the stock of gold stops changing. The gold stock is now lower than before and the relative price of gold is higher.

   (b) *credit cards reduce the need for money in making transactions*

   brief answer This reduces the monetary demand for gold. The same level of transactions can be made with the same level of gold. With the demand for gold decreased the relative price of gold must fall. At the lower relative price, the flow supply of gold is below demand. The gold stock decreases, and this raises the relative price of gold until we reach equilibrium. Notice that the new equilibrium price level is the same as before as long as the flow supply and demand curves do not shift. What happens is that the gold stock is lower than in the initial equilibrium.

   (c) *gold discoveries occur in some faraway land.*

   brief answer Gold discoveries (assuming that they are profitable to mine) shift the flow supply of gold to the right. At the current relative price of gold this leads to an excess of production over dissipation, so the stock of gold rises. This puts upward pressure on the price level and thus lowers the relative price of gold until we reach a new equilibrium. At the lower relative price of gold the flow supply is once again equal to the flow demand (or dissipation).

   (d) *a tariff on imported goods is imposed.*

   brief answer The tariff reduces imports. If exports prices are unaffected we will accumulate gold (the flow supply greater than demand at the current relative price of gold). Hence, the stock of gold will rise as will the price level. We will become less competitive, and flow supply is once again equal to flow demand.[1] This is why

[1] We ignore any second-order effect such as the tariff lowering efficiency, making us poorer and reducing income. These are important, but surely second order effects.

Adam Smith said that no country, no matter how vigilant, can retain an inflow of gold

(e) *silver is to be coined at a rate of ϕ per unit of gold (that is one ounce of silver is now worth ϕ ounces of gold).*

brief answer This is the equivalent of increasing the stock of monetary gold. The stock of money in circulation is now: $M = \lambda[P^G(G + \phi S)]$, where S is the stock of silver. This will increase the price level (lower the relative price of gold). We will become less competitive, and exports will fall relative to imports. Gold will flow out of the country until the price level returns to where it was. If other countries do not coin gold, we lose gold and essentially replace it with silver. Notice that the answer is essentially the same as for a gold discovery.

2. *Suppose that an economy deliberately fixes its exchange rate at a value that gives it a competitive advantage in world markets (whatever this means). What would you expect would happen to the demand for its currency in world markets? Explain.*

brief answer The economy undervalues its exchange rate to make exports cheaper. The demand for its currency rises in world markets – after all, it is undervalued – the price is too low. People need to buy this currency to purchase cheap exports from this country, and it will import less, so it purchases less foreign currency. This leads to an increase in the supply of foreign exchange as the central bank must purchase sell domestic currency to prevent its price from rising. Reserves rise.

(a) *Can the economy maintain a permanent competitive advantage? To answer this, you may use the gold standard model to fix ideas.*

brief answer Unlikely. The rise in reserves, or the inflow of gold, will cause the money supply to swell, which will put upward pressure on the price level. If the economy was not on the gold standard then the monetary base would rise and the money supply would swell. This will lead to rising prices, and will erode the competitiveness derived from undervaluing the exchange rate. The central bank could try to sterilize the inflow, selling bonds domestically to absorb liquidity and offset the effects of the rise in reserves.

(b) *If the economy is open to capital flows does this make it easier or more difficult to maintain a competitive advantage? Explain.*

brief answer This will make it more difficult. The more mobile is capital the more difficult it is to keep domestic interest rates different from those outside the country. This raise the cost of sterilization. People will not purchase low interest domestic assets when they can earn higher returns on foreign assets. Moreover, capital may flow into the country *anticipating* a revaluation of the currency. If this occurs, the pressure on the central bank will accelerate, as it will enhance the already large inflows of reserves.

3. *In spite of the flaws of the pre-1914 gold standard, exchange rates crises were rare for major European powers, the U.S., and Japan. In contrast, such changes became quite frequent in the interwar period. Can you think of reasons for this contrast?*

brief answer Changes in parities reflected both initial misalignments and balance of payments crises. This was due to massive inflation during WW1. Attempts to return to the parities of the prewar period after the war ignored the changes in underlying economic fundamentals that the war caused. This made some exchange rates less than fully credible and encouraged balance of payments crises. Central bank commitments to the gold parities were also less than fully credible after the wartime suspension of the gold standard and as a result of the increasing concern of governments with internal economic conditions.

4. *Under a gold standard, countries may adopt excessively contractionary monetary policies as all countries compete for a larger share of the limited supply of world gold reserves.*

   (a) *What happens if a country tries to do this in isolation? What happens if all countries try to do this?*

   brief answer A monetary contraction, under the gold standard, will lead to an increase in the gold holdings of the contracting country's central bank if other countries do not pursue a similar policy. All countries cannot succeed in doing this simultaneously since the total stock of gold reserves is fixed in the short run.

   (b) *Can the same problem arise under a reserve currency standard (that is, where countries fix their currencies relative to a reserve currency like the pound or dollar) when bonds denominated in different currencies are all perfect substitutes?*

   brief answer Under a reserve currency system, however, a monetary contraction causes an incipient rise in the domestic interest rate, which attracts foreign capital. The central bank must accommodate the inflow of foreign capital to preserve the exchange rate parity. There is thus an increase in the central bank's holdings of foreign reserves equal to the fall in its holdings of domestic assets. There is no obstacle to a simultaneous increase in reserves by all central banks because central banks acquire more claims on the reserve currency country while their citizens end up with correspondingly greater liabilities.

5. *Suppose that Caledonia is on the gold standard and that interest rates suddenly fall below the world rate (perhaps the economy has gone into recession). What would happen to the stock of gold in Caledonia in the short run?*

brief answer The fall in interest rates would lead to an outflow of gold from Caledonia in the short run.

(a) *If Caledonia operates according to the rules of the classical gold standard what happens to the price level? How does Caledonia adjust to a new full equilibrium?*

brief answer The outflow of gold causes prices to fall and Caledonia becomes more competitive. This causes gold to flow back in and prices adjust back to the initial equilibrium.

(b) *Now suppose that the Central Bank of Caledonia reacts to offset the immediate impact on stock of gold (they like their initial stock). What would they do? What happens to the domestic economy? Explain.*

brief answer They could move to raise interest rates to prevent a gold outflow by conducting a contractionary monetary policy. This would cause aggregate demand in the domestic economy to fall, worsening the recession. You could think of the IS curve shifting to the left to start the process reducing interest rates and the monetary authorities reacting by reducing the money supply and shifting the LM curve to the left making everything worse.[2] This is, perhaps, what happened to the US in the period after the Stock Market crash of 1929.

6. *Suppose a small open economy experiences a negative economic shock. To revive the economy the authorities would like to use monetary policy. Suppose that investors believed that this economy would adhere to rule 5. Would this expand or limit the options of the monetary authorities? Explain. Compare this to the case where investors do not believe that rule 5 will be adhered to.*

brief answer If rule 5 is believed then the authorities have some flexibility. They expand temporarily – even suspend gold sales – to combat the recession. Suppose that the current spot rate has appreciated, thus $S_t > \overline{S}$, where the latter is the upper limit of the gold points. If rule 5 is credible investors must expect the future spot rate to decline (the dollar appreciate in value) as S_t must fall eventually below $\overline{S}$. Suppose that they expect this to occur next period. Then , which means that $\underline{S} < S_{t+1} < \overline{S}$. If the dollar is expected to appreciate interest parity suggests that current interest rates decrease relative to foreign rates. Hence, belief in rule 5 makes exchange rate expectations stabilizing — they exhibit negative feedback. This is all due to the credibility enhancing effect of rule 5. Hence, when rule 5 is expected to be adhered to expansionary monetary policy – and a rise in S does not cause a currency run. Interest rates could fall in the wake of this expansionary policy because investors expect future appreciation, and the economy could be stabilized. Now suppose instead that the central bank had no credibility with regard to rule 5. Then any currency depreciation relative to gold might lead investors to worry

[2]For review of IS-LM see the textbook, or my lecture note on income determination, http://econ.la.psu.edu/~bickes/goldstd.pdf,

about the future value of the currency; they might expect that if the gold standard is returned to it will be at a different parity. Hence, investors may speculate against the currency, and interest rates would have to rise to offset the risk that the currency might depreciate further, and thus the ability to use stabilization policy is weaker despite the greater demand for it.