

Inflation, stabilization, and currency boards

In order to understand the benefits of currency boards, first we have to have a closer look to the process of how inflation is produced. This is a topic that has been studied in our profession thousand of times, this short note is just an introduction to the main issues.

1.- Causes of inflation

There are several channels that can produce inflation. One, that is consistent with the BB-NN, is the overheating in the labor market. The second one is obviously the price of imports, in particular commodities. The third one is the increase in the prices of utilities. And finally, and probably the most devastating one, the one due to the financing of the public deficit.

When the economy is overheated, by definition, there is pressure for the real wages to increase. In other words, we should expect a real exchange rate appreciation and wage increases.

Increases in the commodity prices or utility prices will push up the cost faced by the firms, thus forcing a consumer price increase.

These two channels are very important, specially in developed economies, but to be honest, they produce small levels of inflation.

In order to get real numbers, we have to have an important expansion of the money aggregates that will erode, in the end, the value of the domestic currency. This happens when we finance a fiscal deficit by printing money.

The first question that I could think of, is what causes more inflation, a fiscal deficit of 3 percent, or a fiscal deficit of 0.1 percent? Well, the answer is it depends. It depends on how these deficits are financed, and more importantly, on the domestic demand. Let me do a series of examples to clarify this statement.

Money Demand

Assume that country A has a 3 percent fiscal deficit (3 percent of GDP). Also assume that the domestic currency as a proportion of total GDP is 12 percent. In other words, in this country all liquid assets (currency, checking accounts, etc.) account for 12 percent of GDP. If this

government decides to finance the fiscal deficit entirely by printing more money, what is going to happen is that the total currency will increase in 25 percent (3/12). This increase in money supply will push aggregate demand up, causing prices to rise. In the long run, prices will increase such that real money balances remain the same. So, inflation will be 25 percent.

Now assume that country B has a 0.1 percent fiscal deficit. Again, assume that we will finance this by printing money. But, assume that in this country the demand for money only accounts for 0.1 percent of GDP. In this case, the new money printed doubles the total currency available in the economy (0.1/0.1) and inflation will be 100 percent.

As should become clear, money demand is crucial to understand the impact of the fiscal deficit. During the early 90's Argentina had fiscal deficit below 1 percent and inflation rates well above 100 percent. Today Argentina has fiscal deficits in excess of 2.5 percent, but inflation is zero.

Money demand depends on expectations. If agents think that domestic currency sucks, they will try to dump the domestic currency in favor of the good one (usually Dollars). The change in the portfolio composition of the agents reduces the demand for domestic currency. Which implies that for the same fiscal deficit inflation would be higher. But, if inflation is high, the currency is really bad (the *vicious-bad-circle*).

Financing

Now assume that both countries have the same deficit (3 percent) and the same real balances (10 percent). Assume that one country can finance the fiscal deficit with something different than money, while country B has to print money. It is clear that in the second country inflation is 30 percent. Now, if the first country can finance the deficit with domestic debt, what is the monetary expansion? Zero? Thus, inflation should be zero too. What if they can raise foreign debt? Or use reserves? Well, in all these cases, the impact on inflation is zero.

If the fiscal deficit is financed with domestic debt, then there will be an increase in the interest rate. The idea is that a higher level of domestic debt will require bond holders to shift their portfolio toward this debt. In order to do so, the return in those assets has to increase (after risk had been compensated). This implies that the cost of financing the fiscal deficit with domestic debt is that domestic interest rates increase, thus, a small recession should be around

the corner sometime soon.

If the fiscal deficit is financed with foreign debt, then domestic interest rates are little affected. The intuition is that only the interest rate at which the country finances itself in international markets will be affected. Obviously, there will be some increase in the domestic interest rate, but it should be clear that this is more benevolent than financing the deficit with domestic interest rates.

Finally, if the fiscal deficit is financed with reserves, then not even the foreign interest rate is highly affected.

What are the costs? Well, that is called balance of payments crises. If a government decides to finance a lot domestically, interest rates go up a lot and there is a recession. To avoid that, they decide to start calling City Bank. City Bank is happy to lend at the beginning, but not for too long. After several rounds of irresponsibility, City Bank says enough, and the country is forced to use reserves. The bad thing is that reserves have been defined uniquely in the positive numbers. This means that when they reach zero, there is no one available to finance the government. They are forced to devalue.

Inflation shows up, and shows up to stay for long. That is when a stabilization program is needed.

2.- Types of inflation

There are three types of inflation: high, medium, and low (so original!)

Low inflation rates are usually low (a deep definition, no?). Almost certainly below 10 percent per year (however, if you ask a German, 2.1% is too high). The most important characteristics of this type of inflation is that it is the result of either labor market pressures (overheating), public sector prices, or commodity price inflation. Lets concentrate only in the labor market overheating. As we discussed before in the dependent economy model, an overheated economy will tend to push wages up, and therefore, to generate inflation. The solution is to cool down the economy: to reduce the aggregate demand. This is not usually easy to achieve (and as an example see for how many months the US FED has been increasing the interest rate as a response of tight labor markets). The problem is that the Central Bank does not want to overshoot and cause an unnecessary recession. The trade off is that the country is

experiencing 2 percent inflation instead of 1. This is not a big deal. So there is no reason to alarm your self if inflation has moved one point up, but it will be if unemployment doubles.

High inflation rates are usually very high. For example, 50 percent monthly inflation for two months is considered hyperinflation, 100 percent a year, etc. There is not a precise number for what is considered a high inflation, but I hope these examples will clear some of it. Now, the main characteristic of high inflation rates is that the inflation is purely a monetary effect. The main difference between this type of inflation and the low type is that here the main cause is an expansionary monetary policy, usually accompanied by a fiscal deficit. One of the characteristics of high inflation rates is that the economy tends to dollarization. Domestic currency has no more meaning as a medium of exchange, and therefore, consumers switch to foreign currency (usually Dollars). Dollarization has the advantage that, even though in domestic currency the inflation rate of goods is very high, in the foreign currency, the inflation rate is low.

Medium inflation rates are those that are neither high, nor low (I'm so good at this precise definitions! No?). The main characteristic of this type of inflation is that everything matters: monetary policy, labor market tightness, service prices, etc. Moreover, what makes this type of inflation a real problem is that inertia becomes part of the system. Inertia means that wage contracts are set accordingly to past inflation rates, rather than expected inflation rates. Inertia puts strong constraints on the institutions required to stabilize prices.

3.- Stabilization policies

How can we reduce inflation? Well, low inflations are very hard to fight. We have to reduce domestic demand without generating a large recession. That, by definition, is an extremely hard task. However, when a country has low inflation one more point (or one less point) is not a huge deal. The central bank can deal with the labor market pressures slowly.

High inflations are, on the other hand, the easiest ones to reduce. The main reason is the dollarization. As was mentioned before, in Dollars the inflation rate is the US one. So, if the Central Bank introduces a new currency (the Rigobonian) fixed to the Dollar, then the inflation rate in the new currency should be low. However, if the main cause of the monetary expansion was an irresponsible government and the fiscal policy does not change after the introduction of the new currency, agents know that the fixed exchange rate will be abandoned in the future. This

means that there is an expected devaluation of the Rigobonian, and therefore, the inflation rate will be larger than in US Dollars. The lack of credibility generates the problem of not being able to reduce inflation. The question is then how we deal with the problem of credibility? (next section)

Medium inflation rates are the hardest ones to control. There are two main reasons: inertia and relative price disequilibrium.

First, the inertia (which I think is the main problem) is the result that current inflation rate highly depends on the previous year inflation rate. This is the result of both the behavior of the agents and the institutionalization of the inertia in wage contracts. For example, there is a clause that says that current wage increases will recover the real wage lost in the previous year. This is a backward looking indexation, generating inertia in the contracts. The stabilization program in this case, not only requires the same ingredients of the high inflationary programs but also needs institutions that can break the existing inertia in the contracts. These institutions have to be extremely credible in order to achieve its goal.

Second, when there is medium inflation, prices in domestic currency increase in a non-coordinating way (not all of them increase at the same time). For example, assume that shoes' prices increase in odd months, while socks' prices increase in even months. There is no coordination between the industries. If suddenly prices are stopped at the middle of an odd month, the price of shoes is relatively too high with respect to the price of socks. The reason is that shoes have just adjust their price, and socks is just going to do it (note that this does not happen in hyperinflation, when the prices are set in dollars and therefore the relative price is equal to the international relative price. This is equivalent of having price increases every day). This disequilibrium cannot be maintained. What happens? Well, the relative price has to move, and the usual way is that the good that is relatively too cheap increases its price. In other words, there is some inflation rate that occurs because relative prices have to adjust. This takes a couple of months, after that inflation should be small.

4.- Credibility vs. Flexibility

As can be seen, the main problem of reducing medium and high inflation is the credibility of the new regime. How is credibility achieved? By institutions. What is the cost of achieving the credibility? The lack of flexibility. Let me formalize these.

The main advantage of fixed regimes is not the facilitation of trade or the hedging, is the price stability, credibility and the fiscal discipline it imposes. The disadvantage is that, sometimes, it will be beneficial for the economy to devalue (a real wage decline is needed to achieve equilibrium). Lets see the trade-off:

Assume a country has to stabilize its price level. Assume the government chooses a very rigid institution (a currency board, or a single currency union). Agents know that the probability of devaluation is small in this environment, and therefore, domestic inflation drops dramatically. Moreover, to maintain the currency and price stability unions, consumers, and politicians are willing to make sacrifices and reform, privatize, and have a more market oriented economy. Therefore, fiscal discipline is guaranteed. This sounds like paradise!!! Why do not all countries have a single currency? Well, there are two costs: reduction of sovereignty and flexibility (which in the end are just the same).

Assume there is a bad shock to the government revenues. The government has to decide whether or not to adjust the expenditures. A tight monetary policy implies that the fiscal deficit has to be financed through bonds (domestic or foreign). The market will punish the increase in debt by higher interest rate, the real exchange rate will appreciate, the aggregate demand will fall, and therefore, a fiscal authority will think twice (or several times) before running a deficit if it knows that the exchange rate will be maintained. On the other hand, if the fiscal authority knows that the central bank will devalue the currency to maintain the level of reserves or interest rates, then a fiscal deficit implies a depreciation of the exchange rate. In this case, if the cost of adjusting the expenditure is larger than the social cost of the devaluation (for the politician), then no adjustment takes place.

You see, this is a good example because: if the source of the revenue shock is

irresponsibility then a fixed exchange rate is great!!! The bad behavior today will require an effort from the government today to adjust: discipline in the end is guaranteed, and that is what we want when we are dealing with irresponsibility. However, if the source of the shock is an earthquake, it is not clear that today we want to reduce expenditures. In fact, maybe we want to increase them. Maybe we want to take care of the people under distress and offer some transfer to solve their problems. Maybe the best alternative is to socialize the losses through inflation and/or devaluation. In other words, maybe the source of the fiscal shock is bad luck, which means that in this situation, the economy is poorer and the solution is to reduce the real wage: either through devaluation, inflation, or both. In this case, the fixed exchange rate is a bad idea: the regime is not allowing the depreciation or inflation to take place. Therefore, the only way of reducing the real wage is through a reduction of the NOMINAL wages. In other words, the economy needs unemployment. If the labor market is very flexible, the unemployment goes up, and people are hired at a lower wage. However, if there are frictions in the labor market, this adjustment might take a long time (and in the case of France even decades).

In summary, fixed exchange rates (through rigid institutions) have the advantage of bringing stability in prices from abroad, but it has the disadvantage that (if the labor market is not flexible enough) unemployment will adjust in a bad event. In the presence of a "bad" shock, a more lax regime allows for some devaluation. The real wage falls immediately, the losses are recognized today, and the economy moves on. On the other hand, in a rigid regime devaluation is not a possibility. The escape valve is unemployment, and therefore the economy spreads through time the costs of today shocks. The difference between these two paths is that in the first one the losses are recognized immediately, while in the second one, the losses are reflected in unemployment and later in real wages. When "real bad" things happen, having the flexibility to move the exchange rate will be better. The idea is that, in the end the economy will be in the same point with both regimes, so what is the benefit of delaying what everybody knows is going to happen? Take the loss today and move on. The problem is the definition of "real bad" stuff. What actually is "real bad"? an earthquake is far too trivial. Is a social demonstration too bad? Is 14 percent unemployment too bad? When is actually allowable fiscal stimulus? The answer to these questions is unclear.

This is the trade-off between flexibility and credibility. Inflexible institutions buy

credibility (given that their commitments are very likely to be held) but pay by the lack of flexibility when real shocks happen.

5.- Fixing the exchange rate

There are several ways in which you can fix the exchange rate. We can have a promise from the president of the central bank (CB) to a band, we can have the promise of the CB to a fixed exchange rate, we can have a Currency Board, we can have no domestic currency (only dollars, or a single currency), or we can declare our self part of the other country (became a colony).

Flexibility decreases through out all these measures, credibility increases. For example, if a small country declares a war to US (and loses, not like the Peter Seller's movie), and in the end we become part of US. What you think is the probability that our currency will devalue with respect to the Dollar? Zero!!! However, we have lost some flexibility, and in this case (which is an extreme) we have even lost part (sorry, all) of our sovereignty.

On the other hand, assume the president of the central bank promise that he is not going to devalue. Well, at the beginning we believe the promise because it is the President of the Central Bank. However, imagine that a couple of months in the road you see in the TV that the president of the central bank issues a statement that there will be no devaluation. Who was talking about devaluation? (you say) You start getting worried and following the exchange rate closer. The next month the statement is "we will never, never, NEVER devalue our currency" When the president of the central bank says three times never, the devaluation was already discussed in directory. You see, promises can be broken, and the cost of breaking them is small. Is just the reputation of one individual who is going to leave the institution in the future (and after this event, probably very soon).

Currency Board.

What is a currency board? A currency board is a set of strict rules for the central bank. The idea is that no money creation can occur without the counter part increase in reserves. This means that the money base is fully backed by reserves. Moreover, it means that the central bank is unable to buy or sell public debt. Therefore, there is no role for monetary policy. There are several types of currency board, more or less backed money. In the end all of them are some combination of this set of rules.

What are the benefits? First, there is low probability that the fiscal deficit will be financed with monetary injection: inflation falls. The credibility of the regime is high in this respect. Second, the fiscal deficit will be financed in the open market by issuing bonds. The market will punish bad behavior of the government by increasing the interest rate, and therefore, encouraging fiscal responsibility. Third, the reform process has to be accelerated. This is in line with the fiscal responsibility. Usually to achieve the first one the economy needs privatization, social security reform, etc. The fact that there is no room for fiscal deficit forces government and congress to approve and accelerate the process of reform.

What are the costs? Well, if there is a fiscal shock interest rate will go up and the financial sector will suffer. Second, unemployment is the escape valve (as before). Third, how you deal with inflation if it didn't come down at a reasonable speed? How you deal with the real exchange rate appreciation?

As everything, there are benefits and costs. Currency board is a good ingredient to stabilization. A very good one! However, is quite naive to think that the fiscal authority will discipline itself by changing the monetary regime. I think that, in a country like Indonesia, in the end the fiscal authority will dominate this fight and the central bank will have to give up. In these type of country, a currency board can not guarantee a healthy financial sector, a flexible labor market, or fiscal responsibility. However, the people in favor of currency board will tell you that those things can only be achieved if the pressures on the economy are so high that labor reform, financial reform, and fiscal responsibility are the only alternatives to avoid the collapse. Well, this is a high bet!!! The economy is betting on the monetary policy disciplining fiscal, labor and financial sectors. The question is then, are we sure this can happen?