

International Economics: Final Assignment

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June 2020

1. **What predictions does the purchasing power parity theory make concerning the impact of domestic inflation on the home country's exchange rate? What are some limitations of the purchasing power parity theory?**

Purchasing Power Parity (PPP) theory provides an explanation for the effect of relative price-levels as a long-run determinant of exchange rates. A commonly understood version of PPP theory is called The Law of One Price. The law of one price states that: in a common currency, the price of each good across the world must be the same. There are a number of underlying assumptions in this, which as we'll see, are the limitations of PPP theory. In practice, the law of one price holds reasonably well only for globally traded commodities such as Metals, Oil, and Chemicals. However, in principle, a logical restatement of the law is: The pursuit of profit tends to equalize the price of a traded good in a common currency, hence maintaining "parity" of "purchasing power". As a hypothetical example, if an identical calculator is cheaper in India than in the US, Indian exporters see this as a business opportunity to export this calculator to US. But, in an export receipt, there is an influx of rupees into India, the rupee appreciates, and thus there is a tendency for price equalization in a common currency.

The Big-Mac index provides a toy metric for how much a currency is overvalued or undervalued. A Big-Mac burger offered by McDonald's is identical across countries, and is immune to trade barriers and shipping costs as it is produced locally. The Big-Mac is therefore an ideal example good used by economists to test the law of one price. In this approach, economists first keep note of the US price of a Big-Mac, say \$4.2 as reported in 2013. Then, the price of a Big-Mac in another country is converted to US dollars using the prevalent exchange rate. For instance, a Big-Mac costing 84 rupees in India was equivalent to \$1.62 in 2013. According to PPP theory, these prices should have been equal, but as we see, it is much lesser in India. Hence, the rupee is said to have been undervalued by $(1-1.62/4.2)*100 = 61\%$ in 2013!

While useful, it is obvious that the Big-Mac index doesn't give a full-economy picture. Generalizing the Big-Mac index, one has to use the Consumer Price Index (CPI) or Producer Price Index (PPI), which in a yearly time-scale, are directly related to a country's inflation rate. Hence, the best version of PPP theory is the following: In the long-run, the exchange value of a currency appreciates or depreciates at a rate equal to the difference of the inflation rates of the two countries in consideration. For example, if the rate of inflation in India is 5% more than in the US, the rupee must depreciate by 5% relative to the dollar. Hence, according to PPP theory, **a relative domestic inflation leads to a depreciation of the domestic currency** in order to maintain parity of purchasing power.

However, there a number of limitations of PPP theory.

- It is not applicable when there are shipping costs, trade barriers, and imperfect competition. Significant shipping costs, import tariffs, and monopoly can induce price gaps between sellers of an identical good.

- As evident from the Big-Mac index, it is not applicable when there are Income Disparities. The Big-Mac costed lesser in India due to lesser affordability, despite a high exchange rate.
- Most importantly, PPP theory overlooks investment flows. About 98% of the world's foreign exchange transactions today are in asset trade, with just a miniscule 2% in import-export of goods and services.
- It is unclear if Consumer Price Index or Producer Price Index are the most accurate indices whose inflation can be used to extrapolate exchange rate fluctuations.
- PPP predictions use a Base Period with respect to which inflation is considered. The choice of base period becomes a factor.
- Even when applicable, say between rich countries US and UK, it is reasonable only in the long-run. PPP is a poor forecaster of short-run exchange rate fluctuations as it ignores the asset market.

2. How do adjustment in domestic interest rates help affect international investment flows?

As mentioned in the previous answer, about 98% of forex transactions are in the asset market. Assets refer to a variety of financial instruments such as treasury/corporate bonds, bank deposits, company stock, and real estate. Typically, stakeholders are large financial companies and national governments. Let us consider investment flows between India and the rest of the world. So the domestic currency is Rupees and I refer to India wherever I mention domestic. When, say, Goldman Sachs (GS) from the US wishes to invest in financial assets outside the US, it wants to maximize expected return. In order to maximize return, GS looks at a few key factors in deciding where to invest and what instrument to invest in. In particular, considering say India, it looks at

- Nominal interest rate: The nominal interest rate is the rate of interest GS receives on a financial instrument in rupees.
- Inflation rate: This is the rate at which price levels in India increase, and hence affects the long-run returns for GS.
- Real Interest rate: Defined as the difference between nominal interest rate and inflation rate, the real interest rate provides a unified metric to judge the quality of an investment. For example, say with a certain amount of dollar capital, GS has to choose between investing in an Indian bank account and an Italian treasury bond. GS compares the real interest rate of both these assets to guide its investment decision.
- Expected changes in exchange rate over the term of investment: If GS expects Indian currency to appreciate over the term of investment, it expects greater returns, and hence looks at Indian assets favorably. In contrast, if the rupee is expected to depreciate significantly, GS reduces its ownership of Indian assets. Instead, Indian companies become more interested in buying US assets.

For large investments, real interest rate is key in guiding short-term investment flows. If there is an **increase in domestic real interest rate**, foreign companies would like to purchase Indian assets. This results in an influx of rupees into India, and the **rupee appreciates**. A few high-value purchases by foreigners can also mean an expected medium-term appreciation of the rupee, attracting further domestic investment. Overall, domestic investment would be viewed favorably by foreigners.

On the other hand, if there is a **decrease in domestic real interest rate**, domestic investment is viewed unfavorably due to lesser returns. Instead, India would like to purchase assets abroad. This leads to an outflux of rupees, and hence, the **rupee depreciates**. A few high value purchases by India can also mean an expected medium-term depreciation of the rupee, attracting further foreign investment. Overall, foreign investment would be viewed favorably by Indians.

3. What implications does currency pass-through have for a nation whose currency depreciates?

Let us consider India to be the domestic economy. We naturally expect the immediate effect of a currency depreciation to be that the Rupee-price of imports increases, while the Rupee-price of exports remain constant. Currency pass-through is a metric correlating the change in import prices with the change in the domestic currency value. *Complete* currency pass-through means that import prices change in proportion to the currency value change. For example, a 5% depreciation of the rupee corresponds to a 5% increase in import prices in case of complete pass-through. A *partial* currency pass-through means a less than 5% increase in import prices in response to a 5% depreciation of the rupee. As such, we may define a currency pass-through coefficient that takes value 1 if there is complete pass-through and 0 if there is no pass-through, that is, currency depreciation does not affect the rupee-price of imports.

Now, assuming that there is at least a partial currency pass-through, depreciation implies a short-run increase in the rupee-price of imports. A short-run increase in the rupee-price of imports and constancy of rupee-price of exports means Indians are spending more on imports, and hence, this means a worsened short-run trade balance. In the long run, under assumption of elastic demand in bilateral trade (Marshall-Lerner condition), the trade balance improves due to decrease in the quantity of imports and increase in the quantity of exports. This is called the J-curve effect. In response to a currency depreciation, the trade balance first decreases, then increases in the long-run.

In the absence of any currency pass-through (coefficient = 0), we expect no short-run effects whatsoever, and hence, zero time lag between a currency depreciation and an improvement in the trade balance. However, as we increase the level of currency pass-through ($0 < \text{coefficient} < 1$), short-run worsening of trade balance becomes significant and we have a time lag leading to the onset of improving trade balance. For a complete currency pass-through (coefficient = 1), the time lag is maximum. This means that a currency depreciation can lead to worsening trade balance for a large amount of time before improving. According to empirical evidence, the time lag leading to the onset of long-run effects could be in the order of years! The time lag is attributed to delays in recognition of changing condition, decision making, delivery, replacement, and production.

4. Present the case for and the case against a system of floating exchange rates.

A fixed exchange rate is pegged against a standard, while a floating exchange system allows the exchange rate to be governed by market forces. Most countries adopt a mixture of both, although floating rates are more prevalent in the current international economy. The choice between the two is based on the characteristics of the domestic economy in consideration. First factor is the size of the economy. For small countries where trade is a large fraction of national output, a fixed exchange system is better as the cost of currency fluctuations can be very high. The second factor is inflation. If inflation in the domestic economy is much higher than its trading partners, a floating exchange system becomes imperative to maintain competitiveness of the economy's export goods in the world market. Another factor is the flexibility of the labor market. If wages are rigid, there is a greater need for a floating exchange system to help the economy respond to external shocks. Another factor is the credibility of policy makers. If the world perceives a country's central bank as being incapable of controlling inflation rates, a fixed exchange system is better. Lastly, as an economy becomes more and more open to international capital, it must switch to a floating exchange system.

However, there are both pros and cons once an economy switches to a floating system. As markets respond quickly to changing demand and supply conditions, there is a continuous adjustment of the Balance-of-Payments, maintaining a favorable trade equilibrium. However, as a downside, this also makes the economy more susceptible to price inflation. Another advantage of a floating system is

ability of the central bank to set independent monetary and fiscal policies. From the "impossible trinity", we know that Honk Kong, an economy with free capital flows but a fixed exchange rate cannot have an independent monetary policy. This forbids the central bank from adjusting domestic interest rates, and it also has to continuously offset capital flows to maintain a fixed exchange rate. However, as a downside, monetary independence can mean that a government can indulge in illogical financial policies. The other claimed advantage of a floating system is simpler institutional arrangements. The responsibility of the central bank is reduced as it doesn't have to adopt inflationary or deflationary rate adjustment policies. However, as a downside, wide fluctuations in short-run exchange rate due to disorderly investment patterns can be detrimental to international trade for the country as a whole.