Monetary model of exchange rate

In this paper, the main focus will be on the forward looking monetary model of exchange rate determination and some points surrounding this topic. I will consider the purpose and make a comparative analysis between two models. The two key models I have chosen to use are the flexible price monetary model and the Dornbusch sticky-price monetarist model.

For the purpose of this essay I will be looking at the effects of the exchange rate by the domestic nominal money supply. I will also be presenting a graphical representation of the effects to help my further explanation. In conclusion, I will assess the Flexible price monetary model and how it helps towards determining the exchange rates and how reliable this model is.

Exchange rate is defined by Anne Krueger as:

" The price at which one national money can be exchanged for another"
To be more clearly defined for the essay the exchange rate will be defined more specifically as the domestic currency units required for a foreign currency unit. There have been many developments of sophisticated models that illustrate the exchange rate behaviour. However, this discussion will be about the flexi price monetary model. This model was developed by Frenkel, Bilson and Mussa.

It is said to be that the model is defined as

" is an extension of the purchasing power parity … essentially it appends a theory of the determination of the price level to a PPP equation in order to explain the exchange rate"
This means that the model can forecast the change in exchange rates and price levels in relation to current and expected future values of variables for example the money supply, income level and the interest rate.

The main assumptions in this model are that the Power Purchasing Parity

(PPP) holds continuously. PPP can be defined as

" Aneconomic theory that estimatesthe amount of adjustment neededon the exchange rate between countries in orderfor the exchange to be equivalent to each currency'spurchasing power."

This means that the model will adjust to shocks, to ensure the goods and

stocks prices in one country will be the same price in another country. This

links with another assumption that the prices are assumed to be flexible,

" This implies that movements in the exchange rate must be directly proportional to movements in prices not only in the long run but continuously."

Another assumption is that the Uncovered Interest rate Parity holds as well.

This can be referred to as the

" Equality of expected returns on otherwise comparable financial assets denominated in two currencies, without any cover against exchange risk."

This implies that the model assumes that

" The expected rate of return on domestic and foreign bonds are equal"

This defines them as being perfect substitutes. Another assumption is that

the

" The money supply is assumed to be exogenously determined by the monetary authorities and money markets are continuously equilibrated"

This means demand for money will always equal supply for money

The model has given many functions for the model, which are the

explanations of the flexible price monetary model on the basis of the

assumptions. The domestic money demand has is shown as

$m_t - p_t = ay_t - bi_t$

m is the log of domestic nominal money supply

p is the log of domestic price level

y is the log of domestic real income

i is the log of nominal domestic interest rate

This equation simply states that the

" The demand to hold real money balances is positively related to real domestic income due to increased transactions in demand and inversely related to the domestic interest rate."

The foreign money demand function is specified as

Where m* is the log of foreign nominal money supply

p* is the log of foreign price level

y* is the log of foreign real income

i* is the log of foreign interest rate

We can rearrange these two equations to make p and p* the subject:

[1]The PPP that holds continuously is expressed as

$s_t = p_t - p_t^*$

Where s is the log of domestic currency price for foreign currency.

We can then extend this equation with (2) and (3) equations to derive

$s_t = (m_t – m_t^*) – a (y_t – y_t^*) + b (i_t – i_t^*)$

This is known as the reduced form exchange rate equation and is explained

by Keith Pilbeam as

" The spot exchange rate (dependent variable) on the left hand side is determined by the variables (explanatory variables) listed on the right hand side equations"

So far, the model has been explained as a general concept. However the

model can be interpreted as a forward looking monetary model which helps

look at the future action of the exchange rate.

" According to UIRP (uncovered interest rate parity)… the expected change in the spot exchange rate during a certain period of time is equal to the effective interest rate differential in the same time period between two countries"

It can be said that

$i_t – i_t^* = E_t (s_{t+1}) – s_t$

Where t is today. We can further expand the equation to make the model

forward looking;

$s_t = (m_t – m_t^*) – a (y_t – y_t^*) + b(s_{et+1} – s_t)$

This then can be interpreted as the expectation of tomorrow's exchange rate

having an impact on the exchange rate today. Some go on to further on to

derive and explain further how to derive an exchange rate and it has been

said that

" Foreign exchange rate is the sum of all future fundamentals expectations discounted or the present value of all expected future values of the fundamentals"

However it has been said that predicting future fundamentals are not visible

therefore

" The forward looking model has little practical use in determining or predicting foreign exchange rate"

Furthermore the model can derive predictions about the effects of variables on exchange rate. These effects are formerly known as shocks to the economy. For example, in the context of the flexible price model; if there was a negative shock to the domestic nominal money supply then this will lead to a shift in the money supply left/ downwards, which would therefore implicate an decrease in price levels and for PPP to hold continuously this implies an appreciation of currency. These movements move in exact proportion relative to the amount decreased in the nominal money supply. Here is a graphical representation that explains this process.

Where mm schedule is the money market schedule (which is assumed to always be in equilibrium so the money supply will always meet money demand). Point A shows the initial full equilibrium. As PPP holds the equilibrium moves towards B. Furthermore, these affects can happen at different stages in time, all depending on the type of shock. For example, if the negative shock to the nominal money supply was anticipated then we could represent the money supply, price level and the exchange rate on a time path.

This clearly implies that as the shock is anticipated at time t, the exchange rates start and price and money supply to slowly adjust towards the results

of the shock at the time in which the shock should occur. Moreover if the negative shock was considered permanent then we can clearly define it on another set of time paths for the yet again the same variables.

These paths differ from the anticipated shock in that the effect from the shock happens instantaneously as the shock has occurred.

In conclusion, with a brief introduction of another model can draw parallels between these two models. The model that I can compare to is the sticky price monetary model; this is another form of monetary model of exchange rate determination which was first outlined by Rudiger Dornbusch. It stated that the prices would become sticky in response to an economic policy changes or shocks, which means the prices gradually tend to change slowly in response. Both models are under the assumption that UIP holds. However, there are differences in the prices reflected by the models in relation to economic shocks and changes in policies. In the flexible model, prices will adjust straight away and in the sticky model prices will gradually adjust. The reason behind this is said to be partly because of the wage adjustment that takes place periodically which is partially due to firms being slow to adjust their prices. Only in the " medium to long run" Pilbeam (2006) will the wages and prices change. Another difference is that sticky model brings the concept of ' overshooting'. This is when the short tem equilibrium price exceeds the long term equilibrium price (due to sticky prices).

Moreover, PPP varies within models; the flexible model is said to be

" Of no use in explaining the observed prolonged departures from PPP"

This implies that the flexible model does not look at the long lasting effect of the PPP not holding, it is assumed that the prices change straight away that there is no time delay in the adaptation. However, the sticky price model does look at the large and prolonged PPP departures (overshooting, sticky prices). However it was suggested that exchange rate does not always adjust in line with the PPP theory. It is said to be due to many factors; such as the statistical problem which means that the concept of equal economies good baskets. However, this is not the case with different consumption patterns and the development of the countries.

Another explanation is that the prices in goods in both countries will be equal by the exchange rate. However, this does not take into consideration the transport costs.

Moreover, there are variations of the same price that varies within different countries (price discrimination – to exploit peoples' willingness to pay in different countries).

This all brings me to the fact that these monetary models might not necessarily be accurate – however there are more complex precise models to accurately determine the exchange rate by other variables.

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