Theories of determination of exchange rates

We have seen that existing studies produced a number of different estimates of the exchange rate of renminbi. The reason for the difference is that the various theories, data and econometric methods used. Of course, not all the theory that actually used are appropriate to predict the movements of the exchange rate. Some may be better than others. Thus it is very important for researchers who study the choice of exchange rate or a better model for micro foundations of an empirical investigation. In this chapter we examine the existing theories and prerequisites, consequences and the advantages and disadvantages, which will be useful for modeling efforts should be made in the next section.

Theories of exchange rate studied in this section can be divided into three types: partial equilibrium models, general equilibrium and disequilibrium models or hybrid models. Partial equilibrium models, the relative PPP and absolute PPP, which only has the goods market and covered interest parity (CIRP) and uncovered parity rate of interest (UCIRP), which considers only the devices on the market, and the model external balance, which states that the exchange rate determined by the balance of payments. exchange rate models of general equilibrium model of the Mundell-Fleming, which deals with the balance in the goods market, money market and balance of payments, but do not have micro-foundations to some extent, the Balassa-Samuelson model which is based on the business of maximizing profits, the Redux model, developed by Rogoff and Obestfeld and PTM (market prices) model, designed to maximize the usefulness of the consumer, a simple monetary model, price flexibility and Dornbusch model (or the Mundell-Fleming-Dornbusch model), the truth obtained by combining the balance of

the monetary adjustment of prices and control production to the long-run equilibrium, and the hybrids can be called PPP or the monetary equilibrium UCIRP. The bill includes research, since many studies consider a basis for determining the exchange rate constant.

3. 1 Purchasing power parity

The starting point is the theory of exchange rate from purchasing power parity (PPP), which is also called the inflation theory of exchange rates. PPP can be traced back to Spain in the early sixteenth century and seventeencentury England, but the Swedish economist Cassel (1918) was the first name of the theory of PPP. Cassel once said that without it there would be significant to discuss over-or under-valuation of the currency.

In this model, let P ie P i * is indicated, as well as good price in local currency and foreign currency. “ S” indicates the nominal exchange rate, which corresponds to the price of foreign currency to domestic currency. According to the “ Law of One Price” the price of a property should be the same at home and abroad, for example, * = ii SP fri When the price is all good equalized between the two countries, and if the basket of goods and the weights of the two countries are identical, then you have the absolute PPP: P = SP * (3. 1)

Absolute PPP theory must first address the relationship between the price of goods to the value of different currencies. The theory requires strong assumptions. In general, the absolute PPP offers an integrated, competitive products to market in the implicit assumption of the risk-neutral world, where the free movement of goods without shipping costs, customs duties,

export quotas, and so on. However, this is unrealistic in the real society to believe that it is not necessary for the costs of goods from one place to another. In the real world, each producing and marketing goods and services consumed by thousands of people, many of which have different prices from country to country due to transport costs, tariffs and other trade barriers.

Absolute PPP is usually a positive condition of market equilibrium of goods. Under the absolute PPP, both domestic and external, a single integrated market. Why not deal with the financial markets and balance of international payments, we believe that only a partial equilibrium theory, not a general. Maybe because a lot of absolute PPP requires a pre-requisite strong practical, this practice does not explain the phenomenon, and marks a high long-term difference in absolute PPP is also documented.

Although the PPP absolute contradiction with the practical data, this does not imply a lack in the market. This simply reflects the inability, without spending immediately transporting goods from one place to another. Thus, a more general version of PPP, the so-called parity of purchasing power on, was introduced to describe the relationship between prices and exchange rates in different economies. In general, the relative PPP can be obtained assuming that the transaction costs associated with the price level proportionally. For example, assuming that the domestic price of goods tat P, and the cost of transportation is CP, where k is constant, the price of foreign goods equal to the price of foreign currency, multiplied by the price-P kt) 1 (in terms of currency national, or

(3. 2)

By placing the logarithm, and then perform different operations on both sides of the equation (3. 2), with respect to time t, we obtain the relative PPP expressed by

(3. 3)

(3. 3) states that the relative change in the exchange rate equals the difference between the rate of inflation in both economies.

Since

can be re-expressed in

(3. 3) is obtained by the logarithm function and differentiated directly (3. 1). If the real exchange rate represents the ratio of national price levels,

If you have an absolute PPP and the real value of an exchange. If you have a relative PPP, the real exchange rate is a constant, but not necessarily equal to one. When the economy is to adopt a fixed exchange rate regime, the predictions of the model relative PPP that a change in domestic prices at the same speed as the external market. In contrast, if inflation is the same as the two economies, the relative PPP, the exchange rate should be constant. Mundell traveled the fact that the People’s Republic of China and the U. S. experience the same inflation rate as software renminbi to the dollar.

It is clear that absolute PPP is based on the assumption of an ideal set of market information and high efficiency of foreign exchange and commodities markets. That allows the transport costs, tariffs and trade barriers, absolute PPP does not. Many empirical studies show that neither absolute nor relative

PPP believes that the short term, since the setting of a lengthy process. While the debate continues PPP, it seems that only hold relative PPP in the long term (Pippenger, 1993). This may explain why PPP was considered something that the state of long-term equilibrium, but in a casual relationship (Pongsak Hoontrakul, 1999). Relative PPP implies that the real exchange rate is constant. However, this theory not only explains why the real exchange rate must remain constant during a certain period of time.

The empirical evidence against PPP can cause inaccuracies in the index that measures the rate of inflation in the countries studied (Frenkle 1978, Genberg, 1978 and Thurow, 1997), the statistical procedure, or a problem with the simultaneous determination of prices and exchange rate (Levi, 1976).

In theory, differences in the PPP in its practical value is caused by differences in production technology and consumer preferences for risk and uncertainty. For example, the Balassa-Samuelson model, says the national rate of productivity growth in relation to a foreign country can lead to a true recognition of the national currency against foreign currency. Many other models (Liu, Ma and Zhao, 2002) that the real exchange rate along with consumer preferences. Moreover, fiscal policy or tariff may change the real exchange rate. For example, to compensate for the Asian crisis, China export tax refund after 1998, and has a similar impact as the real depreciation of the domestic currency. Besides, China plans to increase the tariff on textile exports to avoid sanctions by European countries, which corresponds to a real assessment of the house currency12.

In fact, the PPP has in China, Chou and Shih (1998) showed that the renminbi was overvalued after the economic reform started in 1979, but this is a parity of power for long-term purchase. Using the ADF test and the test of Engle-Granger unit root test and integration, Hu Yuancheng (2003) found that the real exchange rate of the renminbi is not fixed, so that at least in the short run, PPP does not.

3. 2 Interest Rate Parity

By the time the gold standard, monetary policymakers have concluded that changes in exchange rates are influenced by monetary policy. The rise in domestic interest rates are usually followed by the appreciation of domestic currency, and a reduction in domestic interest rates follow the devaluation of national currency. This indicates that the price of the assets of the role of exchange rate changes. The condition of interest rate parity was established in Keynes (1923), such as parity called the interest rate is now connecting to the exchange rate, interest rate and inflation. The theory also has two forms: the covered interest parity (CIRP) and uncovered parity rate of interest (UCIRP). CIRP describes the relationship between spot prices and interest rates ahead of the market for securities, the two economies.

UCIRP describes the connection to the site and exchange rate expectations, nominal interest rates on securities in the two economies.

3. 2. 1 covered interest parity

In this model, it is presumed that at home and abroad of China poses to the United States. A ta nominal interest rate in the PRC, and at that time in the

U. S. * you, as the exchange rate S t spot and forward exchange rate at 1 1 S t If an investor in China, the Chinese yuan deposits in a currency, he will receive back their time, t 1, and the amount of principal and interest, at first you If the investor is to replace a renminbi against the dollar and then deposited in U. S. bank interest * you, the amount of principal and interest in U. S. dollars, even before the S / i) 1 (*. However, because of the rate of change forward a t S, this is the amount of interest and principal value of the yuan ttt SS i /) 1 (1 *. In a perfectly competitive market, it is generally accepted that it is less likely that the difference in yield between the yuan and the dollar continues to persist in any period of time. other words, the renminbi deposit back from the PRC must be the same as the return of the deposit of $ U. S.. This relationship can be expressed through their interest parity condition:

(3. 5)

or

(3. 6)

(3. 6) the exact shape of the interest parity condition. CIRP can come directly from the condition of Fisher and PPP. During the condition of Fisher, the real interest rate at home and abroad, and

Since the effective interest rate equal to the following formula applies:

Assume

or PPP applies, the condition is again obtained CIRP

To make the model simple signal must be introduced:

(3. 7)

Where

determined by the forward premium (discount) rate that exceeds the futures price (falls below) the spot exchange rate.

Using (3. 7) (3. 6) can be rewritten as

(3. 8)

Since

is only a small number, which can easily be omitted, (3. 8) can be written approximately as

(3. 9)

This is the usual form of covered parity interest rates, which indicates that the domestic interest rate must be higher than foreign interest rate in advance in a lump sum premium (discount) on domestic currency. According to the CIRP, where the price of, say, the renminbi against the dollar is fixed, the interests of both countries should be the same. Thus, a small country that has a fixed exchange rate system can not perform an independent monetary policy. Empirically, using weekly observations in January 1962 to November 1967 and Frenkle Levich (1975) confirmed that CIRP performed. Later (1977) extended the studies of three periods: 1962-1967, called the “ silent devaluation, from 1968 to 1969, the turbulent” for him “, and from

1973 to 1975, managed floating, and confirmed the results of previous periods CIRP study is still where the impact of transaction costs should be taken into account. Levi (1990) indicated that differences may occur because of the CIRP four main reasons: (1) transaction costs, (2), the risk political (3) the potential tax benefits, and (4) the preference for liquidity.

3. 2. 2 of uncovered interest parity

However, investors face the uncertainty of future events. The framework of rational expectations, the forward exchange rate is strongly influenced by market expectations of future exchange, if new information should be considered. The environment of uncertainty, a condition un-covered interest rate parity may hold. Since all other variables “ indicates no change, but that the forward exchange rate is 1 S to replace the expected rate) (1 t SE, UCIRP condition is written as:

(3. 10)

This is the exact form of the uncovered interest parity. As the PPP, UCIRP not allow the preferences of investors. In other words, (3. 10) from the condition that investors are risk neutral. This means that agents are indifferent between making an investment is totally safe to return, on the other hand, and offering the possibility of a return on average the same, but the possibility of a much larger or smaller than the return on other side. In other words, they are just the average return.

Likewise, the following approximate expression:

(3. 11)

Where,

the expected level of appreciation and then substituting (3. 11) in (3. 10), and ignores the less than we did previously, we have the condition of uncovered interest parity official:

(3. 12)

The formula (3. 12) indicates that the domestic interest rate must be higher than foreign interest rate equal to the valuation of foreign currency. As the PPP, uncovered and covered conditions of interest rate parity to assume the operation is not an obstacle to a fully competitive balance in the capital market and arbitrage opportunities. It is obvious that this kind of balance is still partial, because only the tools market is considered.

Very few empirical studies support UCIRP. For example, a K-step ahead forecasting equation, and overlay techniques, the weekly data of seven major currencies, Hansen and Hodrick (1980) rejects the hypothesis of efficiency in the aftermarket.

Cited above, that the Fisher open condition can be the basis of interest rate parity. This condition implies that the expected real interest rates equal across countries, the real interest rate defined as the nominal interest rate divided by the sum of one and the expected inflation rate. Fisher open condition means that the difference between the nominal interest rate is approximately equal to the difference between the expected inflation rate between the two countries. Empirically, there is little evidence to support the hypothesis of Fisher Open (Cumby and Obstfeld 1981, 1984). When the

Fisher Open Hypothesis denied the parity of the real interest rate is not maintained.

3. 3 The Mundell-Fleming model

Money is important because it serves as a medium of exchange, the dominant value, and storage devices. Like a modern invention of paper money or currency plays an important role in reducing transaction costs. However, this role is not mentioned in the previous section. Thus, the effect of nominal exchange rate, monetary policy is not clear from the previous models. Model The Mundell-Fleming model developed by the extension of the IS-LM for an open economy and thus to ensure an understanding of how the exchange rate is determined. The IS-LM model considers three markets: goods, money and goods, and especially to analyze the effects of monetary and fiscal policy. When the goods market is not the equilibrium level of full employment, shows how to use fiscal and monetary policy to adapt the economy to full employment for a new balance. Since only two of the three markets are independent, the IS-LM model, only the connection of money and goods. The Mundell-Fleming model, the balance of international payments equivalent to a steady state, money and goods.

Let’s first define the balance of the product market, such as the IS curve

(3. 13)

where Y is domestic national income, C = C (Y) indicates the consumption depends on income, I = I (i) denotes the investment, which is a decreasing function of G represents the nominal interest rate of government

expenditure, X = X (Y *, q) is exports, which are a function of foreign income and real exchange rate. M = M (Y, Q) denotes imports, the increasing role of national income and a decreasing function of real exchange rate.

The real exchange rate determined by

And if the nominal exchange rate, P * P denotes, as well as domestic and foreign prices.

Second, define the balance of the money market curve LM. Let Md / P = L (Y, i) represents the demand for money, which is increasingly a function of national income and a decreasing function of the interest rate, the woman represents the money supply. The money market equilibrium condition can be expressed

Ms / P = L (Y, i). (3. 14)

Finally, the external balance equation is denoted by BP:

BP = CA = KA 0 (3. 15)

where in the current account CA = PX – SP * M and capital account

One of the most important issues in the model, the so-called trilemma, which states that a perfect capital mobility, independence of monetary policy and a fixed exchange rate regime can not be achieved simultaneously. Specifically, he argues that the country’s independence, monetary policy can not be tied to the perfect capital mobility. This argument, however, occurs in an environment small country, and is not necessarily true for the largest economy, for example, China. What we saw in China, is not so small, and

maintain certain capital and control of monetary policy appeared to be independent so far. The model also predicts that the level of the exchange rate is perfectly correlated with the level of money supply in the long term and so monetary policy can only play a minor role. Another important implication is that PEG may lead to further devaluation if fiscal discipline, inflation and balance of payments are not managed well, or if the market instruments of the products of self-fulfilling bubble.

Finally, the effect of devaluation on improving the current account balance can also be weakened if an economy is highly dependent on the re-manufacturing.

3. 4 exchange rate and productivity: the Balassa-Samuelson model

The above discussion, we conclude that the PPP and CIRP (and UCIRP) is only expressed in the form of a partial equilibrium and clearly does not apply to the behavior of producer and consumer behavior. However, the price level determined by the interaction between supply and demand. As supply and demand for the products are associated with the producer and consumer behavior as a starting point for determining the real exchange rate is also studied to investigate the behavior of producer and consumer behavior, which is associated with the micro- foundations of the theory of exchange rate. In this section, the angle of the behavior of producers, who consider the Balassa-Samuelson model (Balassa 1964, Samuelson, 1964). It allows us to play a role that the productivity of the real exchange rate.

The standard version of BS model is presented through a factor aggregate production function of Obstfeld and Rogoff (1996). For simplicity, this model

assumes that the sold production tasks (T) and non-tradable goods in the following format:

where Y is output, the description in the technology and L is labor. Foreign holdings apply the same technology as the national economy, but differs in that the value of technological parameters of the lower A. T represents the tradable sector, and the index of N non-traded goods sector. This model assumes that the law applies to a price of tradable goods and world prices of tradable goods equal to one without loss of generality. Moreover, it assumes perfect mobility between sectors within each industry, but labor mobility is considered equal to zero between farms. The mobility of labor ensures that the wage w equal to that of other sectors of the same holding. What determines the price index is a weighted geometric mean of prices of tradable goods and non-marketable:

Where

tradable goods share of total production. If this relationship is the same at home and abroad, relative prices vis-Ã -vis the outside world

Nominal GDP per worker can be expressed as

Therefore, the relative price can be transformed into

(3. 16)

This formula is that relative prices are determined by relative GDP and relative technological level and productivity of non-tradable sector, the two economies. Given the level of productivity at home and abroad, the highest

nominal GDP growth at home than abroad leads to knowledge of the real exchange rate. Moreover, since the rate of economic growth, higher productivity in the non-negotiable in the country of origin and in the foreign country will lead to devaluation of the real exchange rate.

This simplified model can be easily extended to a more general, which includes two production factors: labor and capital. Consider a small economy produces two composite goods: tradable and non tradable. We assume that the return to production functions of the functions of capital and labor constant scale:

Where K denotes capital. The other variables in the same above. Some manipulation, the log-differentiation of the relative price of tradable goods and non-tradable goods can be expressed:

(3. 17)

Where

E

are either part of the earned income of tradable sectors and non-tradable goods.

Assuming that non-tradables are relatively labor intensive, ie

The model forecasts that the national economy is experiencing a real evaluation of the benefits of productivity growth in tradable exceeds the benefits of productivity growth in non-tradable.

The Balassa-Samuelson model is a pillar of traditional theory of the real exchange rate equilibrium. The main empirical finding based on a model that the country is greater than the productivity levels of tradable non-tradable prices are generally high. BS model is the assumption that productivity growth in the tradable sector will enable the growth of real wages and proportional, as wages for believing that the link is assigned to the non-tradable sector, the wage and price increases in non-tradable sector . This leads to an increase in the general price level in the economy, leading to knowledge of the real exchange rate.

During the initial period of economic reform and openness, productivity in both tradable and non tradable goods production in China was very low compared with developed countries. The opening and economic reform, the difference in economic and technological level of China made it possible to enjoy three advantages of developed countries, ie, cheap labor, high productivity growth and the indirect effects of foreign direct investment. These advantages have allowed the People’s Republic of China for faster growth of productivity in the sector as tradable and nontradable sectors in domestic and foreign markets. According to the BS model as a result of China suffered a real depreciation, and the resulting appreciation of the nominal pressure in the long term.

However, the shortcomings of this model is clear. First, it assumes that the selling price is the same at home and abroad. This is obviously an unrealistic special form of PPP, but only in tradable goods. According to this definition to determine the prices of tradable goods remains unknown. Moreover, since nothing on the demand side is critical of the Keynesian school, which is the

price that a stiff or sticky. Thirdly, regardless of consumer behavior and demand, it is difficult to interpret the fact that market prices evolve. Last and most importantly, this model does not address the role of money, this may be the best explanation is that, in part, the real exchange rate is determined.

Integrating the model with a model of capital accumulation and demand-side economics, Martin Cihak and Tomas Holub (2003) argued that predictions of their models were generally consistent with the empirical results of the Central Bank and the countries of Eastern Europe. But the model is extended there is still room for the money and the nominal exchange rate. That means the money to do this kind of model, and prices are assumed to be sufficiently flexible to adjust supply and demand.