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THE CHARACTERISTICS AND HETEROGENEITY OF CONDUCTIVE EFFECT ON CURRENCY MISMATCH FROM EXCHANGE RATE IN CHINA AND ASEAN COUNTRIES

Abstract: *Studies have shown a direct or indirect conduction from exchange rate to currency mismatch which exhibiting great heterogeneity in different countries. First, when the Asian financial crisis happened, the main reasons for the debt-based currency mismatch countries getting more serious are the large-scale foreign currency debt, the shortage of foreign exchange and the depreciation of local currency. Second, such exchange rate systems as the freely floating exchange rate system, a basket of currencies with too large US dollar weights or broaden crawl range can not effectively inhibit the debt-based currency mismatch, while keeping exchange rate of local currency fluctuated within a narrow range and pegging to the US dollar within a narrow crawling range can help stabilize or weaken the currency mismatch level. Third, after the Asian financial crisis, although the sensitivity of currency mismatch to exchange rate in relatively backward countries getting more intense and greater volatility, the sensitivity of the conduction from the exchange rate to currency mismatch in most ASEAN countries showed a wave-like weakening trend year after year. Fourth, when currency mismatch was impacted by exchange rate, the direction and duration of impulse response is closely related with the stability and intense fluctuation extent of the country's exchange rate.*

Keywords: *exchange rate, currency mismatch, conductivity heterogeneity, panel VAR model.*

JEL classification: C33, C58, F30 ,F33, G01

1. Introduction

Currency mismatch refers to the exchange risk problems resulting from assets and liabilities calculated in different currencies by entities (states, banks, businesses, residents, etc.). Currency mismatch is divided into the type of debt,

the type of creditor's rights, term currency mismatch and indirect currency mismatch, etc. When a country's currency is non-dominant currency, the occurrence of currency mismatch is inevitable, especially outstanding in those developing or emerging market countries. At the same time, the non-equilibrium and irrationality of the current international monetary situation makes the currency mismatch risk of these countries more and more prominent. From Asia financial crisis to Greek sovereign debt crisis, on the surface, the Greek sovereign debt crisis is caused by the huge gap of government expenditure and revenue, but in fact, the long-term currency swaps business agreement between Greek government and Goldman Sachs Group is the main reason, behind which the movement of euro rise after fall since January 1999, resulting in short-term currency mismatch phenomenon to increase the Greek sovereign debt levels. The internal cause of European sovereign debt crisis is that the national credit substituted the domestic financial institutions credit, and then, for pulling the country's economic recovery, the government issued a series of expansion financial and economic stimulus policy to cause the government debt burden aggravated. In addction, countries for their own interests, implement the exchange rate policy in turn affected the creditor asset returns then leading to monetary mismatch problem. Therefore, currency mismatch problem is not only economic problems, but also a political one.

As the countries' exchange rates and the national economic systems are diffrent, the causes and accumulation process of currency mismatch have great heterogeneity. In order to analyze the essential characteristics of conduction on exchange rate to currency mismatch, it is necessary to study the otherness of conduction on exchange rate to currency mismatch in different countries, which will help to the early diagnosis of the financial crisis.

In recent years, in-depth researches have been made on the aspects of the source of the currency mismatch, the impact on the economy, the currency mismatch risk control, etc., but researches focus on the heterogeneity of currency mismatch phenomenon and the relationship on exchange rate are not fruitful The main research perspective is as follow: Calvo and Carmen (2002) considered that the developing countries with a debt-based currency mismatch have a "floating fear". Although claims to implement a flexible exchange rate system, it actually still fluctuates within a narrow range pegged to the US dollar. After the study of East Asian economies, McKinnon pointed out, the countries with a type of creditor's rights currency mismatch always appear a "high savings dilemma" phenomenon which will further increase the degree of currency mismatch. Ye

Wenyu (2011) sorting, comparing and analyzing the new risk cumulated by Indonesia and other Asian emerging market countries, considered that both of the currency mismatch of net foreign currency liabilities type and net foreign currency assets type under certain conditions will affect the economic and financial stability. From the causes of currency mismatch in typical emerging market countries like Southeast Asia and Mexico, Guo Ping (2010) demonstrated that choosing a more flexible exchange rate system and a relatively sufficient international reserve can avoid the economic risks brought by currency mismatch. On the analysis of manufacturing trade valuation and settlement system of East Asia, Li Xingong (2009) proposed the path of establishing the regional financial cooperation mechanism in East Asia. For China's currency mismatch, its characteristic is: the currency mismatch is mainly formed of the superposition of the impact of the short-term foreign currency debt growth and the long lag of deflating long-term foreign loans, the co-mobility relationship between exchange rate and currency mismatch shows cyclical characteristics of 12 years, and the co-mobility relationship is asymmetric. From the perspective of existing researches, the researches about the conduction, impact and differences on countries' exchange rate to currency mismatch are few, it is necessary to research further.

The emphasis of the paper is: first, it analyzes the characteristics of the conduction on exchange rate fluctuations to currency mismatch in countries, and it divides into the type of debt and the type of creditor's rights currency mismatch, and discusses the states of the transformation between them. Second, it researches the heterogeneity of the conductive effect on exchange rate to currency mismatch in countries.

2. The different characteristics of the conduction on exchange rate fluctuations to currency mismatch in China and the ASEAN countries

The heterogeneity of the conduction on exchange rate to currency mismatch does not only depend on a country's economic situation and subject, but also depends on the financial market development degree and the exchange rate volatility expectations and other factors, because the difference of the exchange rate formation mechanism, economic basis, policy environment and fiscal or monetary policy in different countries will make the conduction heterogeneity larger.

2.1. The measurement of currency mismatch and the selection of data

First of all, determine the measurement of currency mismatch and the selection of sample data. At present, there are many methods to measure mismatch currency, each of them has advantage and disadvantage. As the relevant data about all countries and AECM index[1] is difficult to obtain, we choose the index of net foreign currency position (NFCA) to reflect the risk of currency mismatch. Net foreign currency position (NFCA) is the amount of net foreign assets that remains after subtracting net external liabilities. A negative amount means net foreign currency liabilities, while a positive one means net foreign currency assets, the equation is: NFCA=NFAMABK+NBKA$-NBKL$-IB$. The computation formula of NFCA and results of all countries see Schedule 1 to Schedule 2.

The principle of selecting the sample: The sample interval is from 1994 to 2008, and in some countries, the number before 1997 is incomplete. There is no corresponding data in Cambodia, and both Brunei and Singapore implemented the exchange rate hook with the rate of 1:1, so only research the situation of Singapore, and eliminate the data of Cambodia and Brunei. Schedule 1 to Schedule 3 contains the data of nine countries, including China. Number represents: 1-China, 2-Singapore, 3-Thailand, 4-the Philippines, 5--Laos, 6-Burma, 7-Vietnam, 8--Indonesia, 9--Malaysia.

2.2. The conduction characteristics on the national exchange-rate fluctuations to the currency mismatch in the ASEAN countries

In the ASEAN countries, the scale of countries' currency mismatch are quite different, there are several types of currency mismatch, such as the type of debt and the type of creditor's rights, or the type of the conversion between both. As time went on, the performance of countries' currency mismatch is also unstable, and currency mismatches in some counties transferred in different forms. In order to examine the characteristics of different forms of conduction, currency mismatch would be analyzed as above three forms:

[1] Goldstein and Turner (2005) through the research based on the defects of the "original sin" currency mismatch measure indicators, proposed a indicator of measuring the total of currency mismatch called AECM (Aggregate Effective Currency Mismatch), see: Morris Goldstein and Philip Turner, Li Yang, Zeng Gangyi. Currency mismatch – the predicaments and countermeasures of emerging market countries (M). Social Sciences Academic Press, 2005(10), 66-79.

2.2.1. The fluctuant feature of the countries with uncertain currency mismatch

The countries with uncertain currency mismatch refer to those switched between the currency mismatch of debt type and creditor's rights type. During 1995 to 2008, there were three countries transmit from the currency mismatch of debt type turn into the creditor's rights type, namely Vietnam, Thailand and Malaysia.

First, Vietnam

Vietnam's currency mismatch and its exchange rate system are closely related. From 1990 to 2000, Vietnam implemented a single fixed exchange rate system, and was mainly the US dollar peg system, the interval of exchange rate fluctuations was narrow, the risk was low, made the enterprises and banks of currency mismatch do not feel the presence of the risk of exchange rate changes. Because the gap with the dollar which was the dominant currency was reduced, the enterprises didn't take the initiative to control and defuse the risk of currency mismatch, so the reduced degree of currency mismatch is not obvious. At the same time, the effect of Vietnam's exchange rate policy at this stage was not significant, such as the official exchange rate of foreign trade and non-commercial trade, the internal settlement exchange rate of compensating the export enterprises' loss and so on, plus the spread of the Asian financial crisis and the rapid depreciation of the VND, the currency mismatch was in a relatively high level during the whole period.

From 2000 to 2005, Vietnam adopted a managed floating exchange rate system, the central bank of the financial system reform canceled the fixed interest rate system of the dollar loans, made the interest rate's fluctuation follow the foreign market interest rate, it was the first time that Vietnam implemented the linkage system with the international market rates, narrowing of the gap between the interest rate made the net foreign currency assets of Vietnam fluctuate around 0, coupled with the slow depreciation of the VND, the degree of currency mismatch gradually reduced and maintained at a lower level, its currency mismatch changed alternately between the net foreign currency assets type and the net foreign currency debt type, it indicated that at this period a managed floating exchange rate system helped to weaken the degree of currency mismatch.

From 2005 to 2008, the net foreign currency assets of Vietnam increased year by year, the currency mismatch gradually converted from debt type into creditor's rights type, and the trend had gradually increased, achieved maximum in 2008. There were two main reasons: First, China as Vietnam's neighbors, had strengthened the trade cooperation with Vietnam, and imported a lot of Vietnamese

petrochemical, rubber, palm oil and other products to promote a substantial increase in foreign exchange earnings of Vietnam; second, the domestic inflation in Vietnam intensified, the VND depreciated continuously, the export competitiveness enhanced, the foreign exchange reserves increased substantially, and held a lot of the creditor's rights of foreign currency.

Second, Thailand

Before, during and after the Asian financial crisis, there has always existed serious debt-based currency mismatch, the basic reason is the sharp devaluation of the Thai baht.

Before the outbreak of the financial crisis, Thailand adopted the exchange rate policy of a basket of currencies dominated by pegging the US dollar, because of the heavy weights of the US dollar in currency basket, as 82.02% from 1991 to 1995 and reached 92% in 1997, it is a de factor dollar peg system. After 1995, the further appreciation of the dollar led to large-scale current account deficit in Thailand, and currency mismatch began to appear signs of accelerating accumulation. In 1995 and 1996, the degree of currency mismatch respectively rose 112%and 16.2% than last year. In 1997, under the impact of international speculative capital, Thailand's foreign exchange reserves decreased sharply, the exchange rate system of pegging dominated by the US dollar collapsed. On July 2, 1997, Thailand diverted to adopt free-floating exchange rate regime, and the Thai baht was down 20% on that day. Thai baht depreciated, foreign net assets were greatly reduced, and foreign currency debt soared, in that year the net foreign currency liabilities of Thailand accumulated to the largest scale, $ 109.276 billion (see Schedule 1 to Schedule 4), and then triggered a currency mismatch risk, the degree of currency mismatch reached the maximum in past years at -106039.167. And further to increase the settlement burden of the enterprise external debt, the bank had accumulated a huge amount of bad debt, the foreign exchange reserves depleted. Then the free-floating exchange rate policy of Thailand made local currency depreciated, the baht devaluation reached the highest point of 44.43 baht per US dollar. After that, the Thai economy began to recover slowly, the export competitiveness enhanced, the trade deficit decreased, the net foreign currency debt declined each year, and the degree of currency mismatch was better. In September 2001 to 2008, Thailand changed to implement a managed floating exchange rate system, and the Thai baht appreciated slowly. Since 2002, foreign exchange reserves have increased ceaselessly, foreign currency assets amounted to a new record at $8.126317 trillion, the net foreign currency positions from negative began to be positive in 2002, from debt type

currency mismatch into creditor's rights type, and the degree of currency mismatch was significantly improved. Thus, the free floating exchange rate system and the exchange rate measures of high frequency peg to the dollar in Thailand were the main reasons for the aggravation of currency mismatch, and the currency mismatch risk further aggravated the financial crises.

The third, Malaysia

From 1995 to 2008, the changes of net foreign currency assets in Malaysia and Thailand synchronized basically, but the scale and extent of currency mismatch in Malaysia was much smaller than in Thailand. After 1998, foreign liabilities declined year by year, and began to turn to be net foreign currency assets in 2001, with the surge in foreign exchange reserves, the scale of foreign currency net assets accumulated rapidly. This is due to that Malaysia had taken decisive and correct policy measures to deal with the financial crisis and stabilize the exchange rate, and it was the most rapidly the country of economic recovery after the crisis. Before the Asian financial crisis, Malaysia implemented a managed floating exchange rate policy, and its essence is pegged to the dollar, exchange rate of ringgit-dollar had been maintained at about 2.5:1. After the crisis, exchange rate of ringgit-dollar fell sharply and once fell to the lowest level of 3.92:1. To prevent the continued falling of local currency, Malaysia announced the introduction of capital controls on September 1, 1998, carried out a series of the related policy of stable exchange rate: the disposable depreciation of exchange rate of ringgit-dollar locked at 3.8 ringgit per US dollar; the ringgit was banned to enter and exit frontier, and was banned to exchange and circulate overseas; foreign investment capital in Malaysia’s stock market should be frozen for 12 months. A series of measures of capital controls prevented a massive outflow of funds, maintained the extraordinary stability of the ringgit exchange rate, and effectively control the currency mismatch risk. At the same time, the low interest rate policy promoted economic recovery, the currency devaluation curbed imports and stimulated exports, and maintained trade surplus, foreign exchange reserves proliferated, net assets of foreign currency was from negative into positive, and continued to accumulate with international payment surplus, the currency mismatch of the debt type turned into creditor's rights type. On July 25, 2005, Malaysia implemented the floating exchange rate system with reference to a basket of currencies, there was a slight appreciation of local currency, foreign exchange reserves was abundant, net assets of foreign currency increased steadily, and the accumulation of the currency mismatch of creditor's rights type gradually increased.

There was one country from the currency mismatch of creditor's rights type turned into the debt type: Singapore.

Since December 1987, Singapore has implemented a managed floating exchange rate system, and the exchange rate management can be divided into two stages:

The first stage: 1988 to 1997 is the appreciation stage of nominal effective exchange rate of Singapore dollar. The exchange rate of SGD/USD in January 1988 was 2.02, and rose to 1.40. During the next two years, it had been stable at around this level. The nominal effective exchange rate of this period cumulatively increased to 30%, about 3% per year.

Exchange rate appreciation brought the favorable factors are as follow: First, exchange rate appreciation made the inflation rate to be controlled within a certain range of fluctuation, and the average inflation rate of Singapore is only 2.4% in this period. Second, during this period, the foreign exchange reserves of Singapore remained adequate and stable. Because of the active management of foreign exchange reserves, under the premise of meeting the necessary liquidity and safety of reserve assets, to set up a special investment institutions separately with excess reserves, expand the channels of reserve assets investment, extend the reserve assets investment deadline, improve the income level of foreign exchange reserves investment. Third, the level of foreign debt was not serious. Before the financial crisis of 1997, Singapore's current account was basically surplus, there was no huge foreign currency liabilities, net foreign assets was positive, and had a solid capital base. These factors made the level of Singapore's currency mismatch to maintain a stable state. But the degree of its currency mismatch of creditor's rights type was the highest in the ASEAN countries.

The second stage: from July 1997 to now. The impact of the Asian financial crisis and the competitive devaluation in the area seriously affected the economy of Singapore. The exchange rate of SGD/USD was 1.43 in July 1997, and depreciated to 1.76 in October 2000, but the nominal effective exchange rate rose, because Singapore dollar appreciated sharply relative to the baht, the ringgit and especially the rupiah. In the middle of 1998, the crisis began to deepen, and the economy of Singapore shows weak with no inflationary pressure, the Monetary Authority of Singapore began to relax its currency policy allowing SGD devaluation. With the economic recovery, the primary task of exchange rate policy returned to control inflation, the nominal effective exchange rate of Singapore dollar began to rise. At this stage, due to the implementation of active reserve management, the foreign exchange reserves had no larger fluctuation, but can see from figure 5, since

1998, the Singapore dollar had depreciated slowly, on the one hand, to stimulate exports, and foreign exchange earnings increased, but on the other hand, once the Singapore dollar depreciated suddenly, the repayment burden of the enterprises and banks' foreign currency debt will be aggravated. These made the foreign currency debt proliferate, the net foreign assets was negative, suddenly led currency mismatch from creditor's rights type into the debt type, its extent of rapid amplification had a obvious correlation with foreign currency debt, the degree of currency mismatch become more serious with the increase of foreign currency debt, in 2008, the currency mismatch indicators NFCA of Singapore reached $231.84 billion. The main reason is that Singapore as the world's fourth largest financial center, capital flows is highly open, with a significant amount of domestic and foreign currency assets and liabilities, but the exchange rate risk between the domestic and the foreign currency net assets is small, so the alternative between domestic and foreign currency is very big. With the further devaluation of the Singapore dollar, foreign currency debt present the trend of increase, which indicates that the large net foreign currency liabilities further aggravate the degree of currency mismatch.

2.2.2. The fluctuant feature of the countries with currency mismatch of debt type

There were three countries remained the currency mismatch of debt type, namely Indonesia, Laos and the Philippines.

First, Indonesia

The change of exchange rate system in Indonesia is as follows: implemented a managed float exchange rate system from December 1983 to July 1997, implemented an independent variable exchange rate system from August 1997 to September 2001, and from September 2001 to now, implemented a managed floating exchange rate of no pre-announced path (the target framework of currency inflation). Before the outbreak of the Asian financial crisis, although Indonesia implemented a the managed floating exchange rate system, the weight of its peg to the US dollar was the highest in all affected countries, and as much as 100%. After the Asian financial crisis broke out in Thailand, and soon spread to Indonesia, on August 14, 1997, the central bank of Indonesia announced to implement the free floating exchange rate system. The rupiah depreciated sharply, and the decline of rupiah and US dollar was the most serious in all countries suffered from financial crisis, the range of decline as high as 244%. On the one hand, Indonesia enterprises depended heavily on the dollar loans of foreign Banks

and financial institutions, by the influence of the large devaluation of domestic currency, it was difficult for enterprises' management, the credit of bank slumped. On the other hand, enterprises were hard to get the international capital through the financing channels of domestic currency bonds, the enterprises and the government can only use foreign currency to borrow and invest, the enterprises had no channel to raise new funds to repay the foreign currency debt, thereby causing a crisis of liquidity. The large depreciation of domestic currency made the debt burden in Indonesia more heavy, in 1997, the foreign currency debt reached the highest as $157.316 billion, and suddenly increase 22% than in 1996, and its currency mismatch also achieved the most serious level, its value as high as -127443.96. Indonesia was the most serious country hit by the Asian financial crisis, and was also the most serious country affected by currency mismatch. Until 2001, by the impact of domestic political and instable social situation, the exchange rate of rupiah had been volatile. In September 2001, the Government of Indonesia announced the resumption of the managed floating exchange rate system, the central bank through the interventions in foreign exchange market to maintain the exchange rate at its closed target level. Since 2002, when the exchange rate of rupiah-dollar was within the range of 8500 to 10000, the exchange rate was close to stable, the degree of currency mismatch began to improve significantly. With the expansion of trade surplus, foreign exchange reserves rose steadily, although the heavy foreign debt problem has always existed, the proportion of short-term external debt in GDP continued to decline, the degree of currency mismatch was diminishing year after year, until 2008, Indonesia's NFCA was only $904 million, there was basically no currency mismatch. Because Indonesia had draw lessons and taken preventive measures, when the US subprime mortgage crisis broke out, the economic situation had improved obviously.

Second, Philippines

The Philippines' peso had been devalued from 1985 to the Asian financial crisis, because its implementation was the fixed exchange rate system of pegging to dollar, in order to make the dollar's exchange rate stable, Philippines implemented the strategy of the peso depreciating steadily, so when the Asian financial crisis came, the Philippine government had been powerless to control the exchange rate, and causing a big devaluation of peso. The Philippine peso is the first ASEAN countries' currency of serious attack after the collapse of the Thai baht. Before the Asian financial crisis, the exchange rate of peso-dollar had been stable at the level of 26:1. During June to December 1997, the Philippine exchange

rate was free floating, and the peso accelerated to depreciate, in 1998, the depreciation up to the highest point of 40.89, down 38.75%. Compared with other Southeast Asian countries that seriously suffered the depreciation of peso was still relatively light, but in 1997, the degree of currency mismatch in this country suddenly increased 32.7% than the previous year (see Schedule 1), it was not the reason of the increase of the foreign debt balance, but the result of the sharp decline of foreign currency assets. After the Asian financial crisis, the peso started to enter the channel of eight-year depreciation, occasionally rebounded, but collectivity was a sustained, rapid downward trend. From 1998 to 2005, the average exchange rate of peso-US dollar depreciated from 1:40.89 to 1:55.09, the range of devaluation was 34.7%, the devaluation of peso made the degree of currency mismatch aggravate, the serious currency mismatch was always a problem in Philippines before and after the Asian financial crisis, because foreign exchange reserves was limited, the foreign currency net assets had been negative, and with the devaluation of peso, the foreign currency debt reached the maximum $ 57.395 billion in 2003. After 2005, the peso began to appreciate, with the gradual appreciation of the domestic currency, foreign currency net debt sharply reduced, in 2006, the degree of currency mismatch reduced 57% than last year, in 2007, with the surge in foreign exchange reserves, the degree of currency mismatch basically disappeared, in 2008, it was the first time for currency mismatch from debt type turned into creditor's rights type. Therefore, the devaluation of peso was the main reason of the aggravation of the currency mismatch of debt type.

Third, Laos

Laos is the currency mismatch country of debt type, and the main reasons are the relatively backward national economy, less export, more import, long-term trade deficit, and low foreign exchange reserves. From 1994 to 1997, the currency mismatch of debt type had been maintained at the level of around -20, the accumulated scale of currency mismatch was smaller, this is because: on the one hand, during this period, the Lao Government implemented the exchange rate system of crawling peg to dollar and double market, the crawling range was -2% to 2%, and consistent with the nature of the short-term exchange rate. As the dual exchange rate system had the characteristics of the fixed exchange rate system and the floating exchange rate system, it was a measure to deal with short-term international capital flows, it was more flexible than the direct control. With the implementation of the narrow way of crawling peg to the dollar, the government’s implementation of dual market to some extent inhibited

the accumulation of currency mismatch, and remained at low levels. On the other hand, in this period, the foreign net assets and the total amount of financial institutions foreign currency deposits of the monetary authorities and the deposit money banks basically fluctuated in the range of $180 million to $270 million, and at the same time, the country's foreign debt balance also fluctuated at about $1900 million, the difference between both was little. So the scale of the level of debt type currency mismatch was small and more stable. After 1998, by the effects of the Asian financial crisis, Laotian Kip appeared a big depreciation, the exchange rate from 1260 kip per dollar in 1997 depreciated to 7102 kip per dollar, and the Laotian foreign exchange reserves was not enough to stabilize the exchange rate, further led to the big depreciation of Laotian Kip, the depreciation reached 7887 kip per dollar in 2000, the foreign debt balance increased to $ 2,540 suddenly, which increased their foreign currency debt burden, in this period, the crawling interval implemented by the government eased to Plus or minus 5%. At the same time, with the inflation rate of two digits even three digits, leading to the maximum 24.7 of currency mismatch in 2002. But because the foreign currency deposit of financial institutions in 2003 jumped 21.4% than the previous year, foreign exchange reserves had increased, greatly weaken the degree of currency mismatch, and maintained at a smaller level on the future.

It can be seen, first, for the countries with smaller total of economy, the exchange rate system of double market helped to stabilize the degree of currency mismatch, but relaxing the creeping range and the lack of foreign exchange reserves increased the degree of currency mismatch, every fluctuation of currency mismatch was associated with the further depreciation of the kip. Second, the depreciation of long-term domestic currency was the reason of the maintaining and increase of debt type currency mismatch. Third, the free floating exchange rate system made the fluctuation of currency mismatch was intense, the increase in foreign exchange reserves with the managed floating exchange rate system, can make the debt type currency mismatch change to the weakening direction. Fourth, in recent years, the accumulation of the degree of currency mismatch of these three countries reduced year after year, which was due to that the economic development made the foreign exchange reserves have increased, the government through the foreign exchange reserves to intervene in the foreign exchange market, the result was that: can reduce the losses that exchange rate fluctuations possible brought to the micro-economic subjects, or directly bear the losses of currency mismatch for the micro-economic subjects, thereby, weakened the speculative

impulse of short-term capital, reduced the accumulation of the degree of currency mismatch, and the risk of mismatch currency was gradually improved.

2.2.3. The characteristics of the changes in the countries of the creditor's rights type currency mismatch

China and Burma showed the currency mismatch with the characteristics of net foreign currency assets from 1997 to 2008, it reflected in that the net foreign assets and the foreign currency deposits of financial institutions grew faster than foreign currency liabilities, and the creditor's rights type currency mismatch further expanded, for example, from 1997 to 2008, the average growth rate of the NFAMARK $ and NBKA $ in Burmese foreign currency assets were respectively 13.05%and 20.41%, while the average growth rate of foreign currency liabilities was only 4.23%, which accelerated the accumulation of the creditor's rights type currency mismatch. The degree of the creditor's rights type currency mismatch of China has been enlarged year by year (from the beginning of 1985), and suddenly accelerated in the year of 1997 when the Asian financial crisis was happening, the year-on-year growth rate was 48.5% in 1997, and then declined, but the average growth rate from 1997 to 2008 was still at 27.1% (the average growth rate from 1993 to 2006 was only 13.5%), particularly in recent years (since 2004), the currency mismatch with the main characteristics of net foreign currency assets accumulated faster.

Throughout these 10 years, an important characteristic of the conduction on ASEAN countries' exchange rate to currency mismatch was: the currency mismatch in the countries which suffered the financial crisis was relatively high before and when financial crisis broke out, and showed the form of net foreign currency liabilities, it said that the currency mismatch of net foreign currency liabilities and the currency crisis had a certain relevance, the national exchange rate was in a big devaluation when the Asian financial crisis broke out, the devaluation led the net foreign currency liabilities to the expansion, and the degree of currency mismatch further increased. In the Asian financial crisis, the exchange rate changes and the currency crisis in these countries presented the linkage and transmission effects. In addition, the changes of currency mismatch in these countries showed the following characteristics:

First, implemented independent or free floating exchange rate system, under the impact of international speculative capital, if foreign exchange reserves were not enough to cover the large outflow of foreign capital, will make the domestic

currency depreciate, increase the degree of debt type currency mismatch. But a moderate managed floating exchange rate system can help to weaken the currency mismatch.

Second, the foreign exchange risk prevention awareness that the exchange rate system of pegging to the dollar brought to the economic subjects was relatively weak, and the enterprises relaxed or did not recognize the the existence of a mismatch currency risk.

Third, the development of the financial market of the East Asian countries lagged, the domestic bond market which was valued by local currency was not perfect, the channels of domestic financing were few, and lacked of the hedging tool of hedging the foreign exchange risk.

Fourth, before the Asian financial crisis, some governments to ease the current account deficit, raised interest rates to attract foreign investment to ensure the capital account surplus, but increased the cost of domestic lending, which forced firms to borrow short-term foreign debt excessively, and invested in the long-term investment of high risk, exacerbated the double mismatch of currency.

Fifth, some countries made the government-guaranteed salvation as the mechanism of encouraged investment, led to moral risk, excessive bank lending and inadequate supervision, the accumulation of huge amounts of bad loans, credit decline, and indirectly increased the degree of currency mismatch.

Sixth, like the country of Laos, its total economy was smaller, the exchange rate system of double market helped to stabilize the level of currency mismatch, but the relaxation of the crawling interval increased the degree of currency mismatch.

3. The heterogeneity of the conductive effect on currency mismatch from exchange rate and foreign currency debt in different country

3.1. The inspection and construction of model

Introduce the lagged dependent variable in the Panel data model, and the model becomes dynamic panel data model. Its basic form is:

$$Y_{it}=\delta Y_{i,t-1}+X'_{it}\beta+\mu_i+\nu_{it} \quad (1)$$

Thereinto, δis a constant, β is a column vector, Xit and Yit are the vector formed by the dependent variable and the explanatory variables, i=1, 2, …, N, t=1, 2, …, T. $\mu_i \sim IID(0,\sigma 2\mu)$, $V_{it} \sim IID(0,\sigma 2_v)$, $u_{it}=\mu_i+v_{it}$. N is the total number of individual panel data, T is the time.

The main advantage of dynamic panel data model is: When the explanatory variables in the model have the presence of endophytism, through this model can eliminate the errors of endophytism, thus make the coefficients of the explanatory variables get consistent estimators.

For the estimated problem of the dynamic panel data model, Arellano and Bond (1991) proposed the Generalized method of moments of dynamic panel system, the first of the treatment of this method is to carry out the first-order differential to remove the influence of fixed effects, then make several groups of lagged explanatory variables as the instrumental variables, and get a consistent estimator, and can better solve the problem of instrumental variables validity. This method also includes one-step system GMM and two-step system GMM, because the standard deviation of two-step method (two-step system GMM) exist downward errors, it is common to use one-step system GMM in practical applications (Bond, 2002).

In this research, not only to consider the spillover effects on exchange rate to currency mismatch, but also consider the time lag effect of currency mismatch. Therefore, we set up the following basic model of dynamic panel data:

$$Nfca_{it} = v_{it} + \mu_{it} + \delta_{it} Nfca_{it-1} + \beta_0 rex_{it} + \sum_{k=0}^{m} \beta_{it} rex_{it-k} + \alpha_0 wzy_{it} + \sum_{L=0}^{n} \alpha_{it} wzy_{it-L} \quad (2)$$

The “i” denotes the number of country: 1-China, 2-Singapore, 3-Thailand, 4-the Philippines, 5--Laos, 6-Burma, 7-Vietnam, 8--Indonesia, 9--Malaysia. Nfca means the currency mismatch of the i-th country, rex and wzy respectively means the nominal exchange rate and the total foreign debt balance of the i-th country, the time is from 1997 to 2008 (the corresponding dummy variables are from year1 to year12).

From the above analysis, we know that the co-mobility relationships between the different types of currency mismatches and exchange rate are quite different, so these nine countries are divided into three types to research.

First, the countries of the creditor's rights type currency mismatch, China and Burma.

Using the commands of Stata software xtabond2 (Arellano-Bond system dynamic panel data estimator) to estimate, to get the following results through systematic testing, see table 1.

Table 1. The dynamic panel model of the creditor's rights type currency mismatch

Dynamic panel-data estimation, one-step system GMM

Group variable: nation				Number of obs	=	20
Time variable : year				Number of groups	=	2
Number of instruments = 20				Obs per group: min	=	10
Wald chi2(6) = 28656.58				avg	=	10.00
Prob > chi2 = 0.000				max	=	10

nfca	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
nfca						
L1.	.9647786	.1168923	8.25	0.000	.735674	1.193883
wzy1	9.145716	2.770024	3.30	0.001	3.716568	14.57486
wzy2	63.18753	18.42936	3.43	0.001	27.06665	99.3084
wzy						
L1.	6.879108	3.908904	1.76	0.078	-.7822029	14.54042
rex						
--.	140984.4	50349	2.80	0.005	42302.16	239666.6
L1.	-161110.3	41280.44	-3.90	0.000	-242018.5	-80202.16
_cons	-307298.2	245893.8	-1.25	0.211	-789241.1	174644.8

Arellano-Bond test for	AR(1) in first differences: z = -1.80	Pr > z=0.072
Arellano-Bond test for	AR(2) in first differences: z = -0.39	Pr > z=0.698
Sargan test of overid.	restrictions: chi2(13) =21.32	Prob> chi2=0.093

Note: the "1" in the model is on behalf of China, "2" is on behalf of Burma.

Thereinto, nfcaL1.=nfcat-1 , wzyL1.=wzyt-1 , rex--.=rext , rexL1.=rext-1 , wzy1、wzy2 respectively means the total foreign debt balance of China and Burma. It is the same below.

Second, the countries of the debt type currency mismatch, the Philippines, Laos and Indonesia.

Table 2. The dynamic panel model of the debt type currency mismatch

Dynamic panel-data estimation, one-step system GMM

Group variable: nation				Number of obs	=	30
Time variable : year				Number of groups	=	3
Number of instruments = 29				Obs per group: min	=	10
Wald chi2(19) =	2926.71			avg	=	10.00
Prob > chi2 =	0.000			max	=	10

nfca	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
nfca						
L1.	.647083	.1289181	5.02	0.000	.3944081	.8997579
wzy1	-3.579539	.8054828	-4.44	0.000	-5.158256	-2.000822
wzy2	-19.54547	5.390476	-3.63	0.000	-30.11061	-8.980333
wzy3	-1.271406	.3965432	-3.21	0.001	-2.048617	-.4941956
l1wzy1	.4644298	.8978037	0.52	0.605	-1.295233	2.224093
l1wzy2	-21.44586	6.659696	-3.22	0.001	-34.49863	-8.393099
l1wzy3	.1475411	.5844132	0.25	0.801	-.9978878	1.29297
rex1	1257.521	540.9123	2.32	0.020	197.3528	2317.69
rex2	1.042901	1.397625	0.75	0.456	-1.696393	3.782195
rex3	4.66179	2.984234	1.56	0.118	-1.187201	10.51078
year3	-33823.18	8594.733	-3.94	0.000	-50668.55	-16977.81
year4	-34280.46	7288.074	-4.70	0.000	-48564.83	-19996.1
year5	-40183.64	8554.536	-4.70	0.000	-56950.22	-23417.06
year6	-36717.09	7870.515	-4.67	0.000	-52143.01	-21291.16
year7	-34326.23	7634.829	-4.50	0.000	-49290.22	-19362.24
year8	-41323.64	7732.814	-5.34	0.000	-56479.68	-26167.6
year9	-35435.42	7280.869	-4.87	0.000	-49705.66	-21165.18
year10	-20631.68	6146.628	-3.36	0.001	-32678.84	-8584.506
year11	-7039.856	4044.174	-1.74	0.082	-14966.29	886.5799
_cons	129719.7	30502.85	4.25	0.000	69935.26	189504.2

Arellano-Bond test for	AR(1) in first differences: z = 0.01Pr > z	=0.991
Arellano-Bond test for	AR(2) in first differences: z = -0.32 Pr > z	=0.745
Sargan test of overid.	restrictions: chi2(9) =30.58 Prob> chi2	=0.102

Note: the "1" in the model is on behalf of the Philippines, "2" is on behalf of Laos, "3" is on behalf of Indonesia. Thereinto, China l1wzyi means the total foreign debt balance of these three countries.

Third, the countries of the uncertainty type currency mismatch, Singapore, Thailand, Vietnam and Malaysia.

Table 3. The dynamic panel model of the uncertainty type currency mismatch

Dynamic panel-data estimation, one-step system GMM

Group variable: nation			Number of obs	=	40
Time variable : year			Number of groups	=	4
Number of instruments = 36			Obs per group: min	=	10
Wald chi2(10) = 4588.08			avg	=	10.00
Prob > chi2 = 0.000			max	=	10

nfca	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
nfca						
L1.	1.162795	.0653339	17.80	0.000	1.034743	1.290847
wzy	-2.179665	.4181056	-5.21	0.000	-2.999136	-1.360193
wzy1	1.252712	.4190911	2.99	0.003	.4313091	2.074116
wzy2	1.406422	.4878607	2.88	0.004	.4502323	2.362611
wzy3	2.625034	1.097766	2.39	0.017	.473453	4.776615
wzy						
L1.	1.06414	.2097559	5.07	0.000	.6530256	1.475253
rex1	-32317.11	22089.22	-1.46	0.143	-75611.18	10976.97
rex2	-1381.126	861.1711	-1.60	0.109	-3068.99	306.7386
rex3	-5.0435	3.438679	-1.47	0.142	-11.78319	1.696187
rex4	3213.115	12530.35	0.26	0.798	-21345.93	27772.16
_cons	54606.42	44430.54	1.23	0.219	-32475.84	141688.7

Arellano-Bond test for AR(1) in first differences: z = -2.13 Pr > z =0.033
Arellano-Bond test for AR(2) in first differences: z = -0.01 Pr > z =0.989
Sargan test of overid. restrictions: chi2(25) =21.85 Prob> chi2=0.644

Note: the "1" in the model is on behalf of Singapore, "2" is on behalf of Thailand, "3" is on behalf of Vietnam, and "4" is on behalf of Malaysia.

At the significant level of 5%, to test the dynamic panel data model as follow: First, Wald (joint) testing, Wald testing is the test of testing the significance of the estimated overall model. Second, Sargan testing, this method is used to test whether the instrumental variables are overall available, the original hypothesis is: instrumental variable is available. Third, AR testing, it is used to test whether it can eliminate residual serial correlation, and this testing determines that whether the selection of the lag period of model is suitable. For the selection of the lag period of dynamic panel data model, there is no accepted judgment standard at present, the experienced way is that: use the method whether it can eliminate residual serial correlation to discriminate. In the estimation of GMM, the premise of its assumption is that: allow residual exist first-order serial correlation, but not the second-order serial correlation, which means that the estimation of GMM only request no second-order serial correlation, and whether the first-order serial correlation exists does not affects the validity of the estimation of GMM.

For the dynamic panel model of the creditor's rights type currency mismatch, first, Wald testing, the value of Wald in this model = 28656.58, the concomitance

probability P = 0. So we can conclude the overall test of model is significant. Second, Sargan testing, the value of Sargan in this model = 21.32, and while the corresponding concomitance probability P = 0.09, and this concomitance probability P > the significant level of 5%, then accept the original hypothesis that the instrumental variable is available. Third, in this model, the value of AR (1) = 1.80, the value of its concomitance probability P is 0.072. P > 0.05, then accept the original hypothesis at the significant level of 5%, and there is no first-order serial correlation. Meanwhile, AR (1) value = -0.37, the value of its concomitance probability P is 0.698. P > 0.05, then accept the original hypothesis, and there is no second-order serial correlation, the test shows that the selection of the lag period of model is reasonable and steady.

Similarly it is clear that both of the dynamic panel model of the debt type currency mismatch and the dynamic panel model of the uncertain type currency mismatch are reasonable.

3.2. The heterogeneity of the conductive effect on currency mismatch from exchange rate and foreign currency debt

3.2.1. The heterogeneity of marginal effect

First, the countries with the currency mismatch of the creditor's rights type

Dynamic panel model shows that, first of all, the dominant factor of currency mismatch accumulation in the countries with the currency mismatch of the creditor's rights type is caused by its endogenous changes, the spillover effect on the next year from the previous year is 0.964778. Secondly, when the marginal effect on currency mismatch from exchange rate was 140984.4, it means that the exchange rate appreciate (corresponding Rex value reduce), and the accumulation of currency mismatch is weakened, the currency exchange rate devaluate, and the accumulation of currency mismatch is aggravated. But the effect on the currency mismatch of the next year from the exchange rate of the previous year is reverse, this positive and negative alternate influence on currency mismatch from exchange rate can not make the accumulation of currency mismatch continuously increased or decreased, and can help to the fluctuation of currency mismatch to be stabilized in a relatively band. Again, the increase of foreign currency debt will lead to the aggravation of currency mismatch, the effect on currency mismatch from foreign debt balance in Burma is more obviously than in China, its effect value is 63.18753 and 9.145716 respectively, for Burma, every increase of one

million dollars in foreign currency debt will lead to the increase of 63.18753 in currency mismatch. Therefore, the small countries like Burma, has to reduce the risk brought by currency mismatch, the attention of the fluctuation of exchange rate is minor, the key is to reduce foreign currency debt, and control the proportion of foreign currency debt and foreign exchange reserves to be within a reasonable limit.

Second, the countries with the currency mismatch of the debt type

From the dynamic panel model of the debt type currency mismatch of table 2, it shows that, first of all, the same as the countries with the currency mismatch of the creditor's rights type, the dominant factor of currency mismatch accumulation is also itself, but it is weaker than the creditor's rights type, the spillover effect on the next year from the previous year is 0.647083. Secondly, the effect on currency mismatch from exchange rate is still the positive correlation, whether the creditor's rights type or the debt type, the exchange rate appreciation helps to weaken the degree of currency mismatch, and the exchange rate depreciation means the accumulation of currency mismatch is increased, but the differences of the degree of response between countries are large. The marginal effects of Philippines, Laos and Indonesia are respectively 1257.521, 1.042901 and 4.66179, and the marginal effect of Philippines is almost a thousand times than other two countries. Thus, the accumulation of Philippine currency mismatch is mainly from the fluctuations of exchange rate, compared to the other two countries, it is not very serious. Again, in the aspect of foreign currency debt, the effect on currency mismatch from these three countries' foreign currency debt is in the process of positive and negative alternation, the effect in that year is negative, while the effect on the currency mismatch of the next year from foreign currency debt becomes positive. Which explains that after the Asian financial crisis (because the data in the model are after the year of 2007), the effect on currency mismatch from these countries' foreign currency debt is uncertain, the direction and extent of influence are all unstable, so the control of the scale of foreign currency debt is particularly critical. Finally, from the effect on the time dynamic factors of model, we know that over time, the level of overall currency mismatch of the countries with the currency mismatch of the debt type presents a downward trend, and its risk is significantly reduced.

Third, the countries with the currency mismatch of the uncertain type

Because of the exchange rate fluctuations of these countries, the currency mismatch is converted between the debt type and the creditor's rights type, so the results of each country reflected in the model are inconsistent, the positive effect

on currency mismatch from exchange rate is in Malaysia, and the negative is in Singapore, Thailand and Vietnam, but its effects are not significant, it shows that there are the effects of the other ignored factors and random endogenous factors, and needs further research. But the effect on currency mismatch from foreign currency debt is significant, and it is in the process of positive and negative alternation. Obviously in these countries, the foreign debt balance is the main factors to affect the currency mismatch changes directly.

3.2.2. The heterogeneity of the conduction sensitivity on currency mismatch from exchange rate and foreign currency debt in different countries

According to the dynamic panel data model:

$$Nfca_{it} = v_{it} + \mu_{it} + \delta_{it} Nfca_{it-1} + \beta_0 rex_{it} + \sum_{k=0}^{m} \beta_{it} rex_{it-k} + \alpha_0 wzy_{it} + \sum_{L=0}^{n} \alpha_{it} wzy_{it-L}$$

The flexibility on exchange rate from currency mismatch is:

$$\eta_{it} = \frac{\partial(Nfca_{it})}{\partial(rex_{it})} \times \frac{rex_{it}}{Nfca_{it}} = \frac{(\beta_0 + \beta_{it}) rex_{it}}{\delta_{it} Nfca_{i,t-1} + \sum_{k=0}^{m} \beta_{it} rex_{it-k} + \sum_{L=0}^{n} \alpha_{it} wzy_{it-L}},$$

The calculated results are in table 4.

Table 4. The value of dynamic elasticity on exchange rate from currency mismatch

years	China	Burma	Philippines	Laos	Indonesia	Singapore	Thailand	Vietnam	Malaysia
1998	22.338	-57.888	3.127	.101	-.752	.309	.629	82.678	-.939
1999	4.529	-150.45	-1.417	-40.459	-.305	.357	.807	24.167	-7.156
2000	3.479	23.103	-2.039	-7.256	-.375	.407	1.933	14.539	1.436
2001	2.760	23.125	-2.281	-1.862	-.610	.399	4.440	27.397	4.255
2002	2.369	16.604	-2.093	-1.168	-.692	.372	-18.084	33.694	.364
2003	1.951	12.086	-1.834	-8.563	-.628	.342	-1.566	29.046	.340
2004	1.540	9.626	-2.181	5.408	-.590	.287	-1.002	39.853	.252
2005	1.108	5.842	-2.975	-3.986	-.830	.289	-.769	-135.54	.129
2006	.804	4.921	-9.165	11.038	-1.380	.285	-.620	-14.645	.131
2007	.562	3.901	23.365	10.129	-4.004	.279	-.395	-5.596	.092
2008	.372	2.484	3.345	-3.836	10.443	.201	-.262	-3.333	.101

From 1998 to 2008, the 10 years after the Asian financial crisis, shows the following characteristics:

First, the sensitivity of the conduction on currency mismatch from exchange rate in China and Singapore had been positive, for the sensitivity of the conduction on currency mismatch from exchange rate in other seven countries of ASEAN, whether from its numerical size or the direction to see, the positive and negative fluctuation was more intense, and there was no orderliness. Which indicates that after the Asian financial crisis, China and ASEAN countries was active to carry out the reform of the exchange rate system, the sensitivity of exchange rate system from currency mismatch become more unstable.

Second, the sensitivity of the conduction on currency mismatch from exchange rate in most countries had the trend of wave-type gradually weakening. The countries with the sensitivity gradually weakening were: China, Burma, Singapore, Thailand, Vietnam and Malaysia, and Burma and Vietnam were most obvious. Although the sensitivity was weakened, in these 11 years, the absolute values of flexibility on exchange rate from currency mismatch in most countries were all bigger than 1, and maintained high sensitivity. After the Asian financial crisis, all countries maintained the relative stability of exchange rate, but the value of the strong flexibility on currency mismatch from exchange rate did not change much.

Third, in ASEAN countries, the sensitivity on currency mismatch from the change of exchange rate in relatively backward country was more intense, the range of fluctuations was bigger, such as Burma, Laos, Indonesia and Vietnam and other countries. These countries were under the dual pressure of that the foreign exchange relatively was not abundant and the exchange rate was not stable, the conduction on their currency mismatch from exchange rate was more direct, and the spillover effect was more obvious. But for China and Singapore and other countries with relatively good economic development, in recent years, the conduction on exchange rate from currency mismatch appeared slow and weakening signs, the reason why this happened was that the monetary policy of these countries was changed, such as foreign currency derivatives contracts hedge, goods and services project management hedge behavior and equity assets hedge and other policies, these policies had bigger flexibility and choice, which can help to alleviate the degree of currency mismatch.

4. The impulse response analysis of the impact on currency mismatch and foreign currency debt from exchange rate

Use a panel VAR model to analyze the impact effect on currency mismatch from the exchange rate of all countries, when respectively using the panel VAR model to estimate the currency mismatch of the debt type, the creditor's rights type

and the uncertain type, we found that some types of cross-section of individuals were too small (only two countries), which led to the instability of model estimates, so we do not classify modeling, and make the years of 1907 to 2008 of nine countries combined together to form a total panel data VAR model, after the testing of the panel unit root and AIC, SC testing, the lag period is determined as 1. Through the calculation of Stata software, get the panel VAR model of exchange rate (Rex), currency mismatch (nfca) and total foreign currency debt (wzy), the results are as follows in Table 5, and also calculate the figure of impulse response of the Rex, nfca and wzy (figure 1).

Table 5. Panel VAR model

```
================================================
 Panel Vector Auto-Regression: System-GMM Results
================================================
Group variable: id                              Number of groups   =         9
Number of obs=     90                           Number of equations=         3
Number of instruments used: 9
```

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
h_nfca						
h_nfca L1.	.7579796	.0511697	14.81	0.000	.6576888	.8582705
h_rex L1.	2.223669	2.269184	0.98	0.327	-2.223851	6.671189
h_wzy L1.	.1885941	.1602831	1.18	0.239	-.125555	.5027433
h_rex						
h_nfca L1.	.0001009	.0001555	0.65	0.516	-.0002038	.0004057
h_rex L1.	.6004643	.149854	4.01	0.000	.3067558	.8941728
h_wzy L1.	-.0033139	.0048618	-0.68	0.495	-.0128428	.006215
h_wzy						
h_nfca L1.	-.0093216	.0045505	-2.05	0.041	-.0182405	-.0004027
h_rex L1.	.9453051	1.037841	0.91	0.362	-1.088827	2.979437
h_wzy L1.	.9725585	.1087867	8.94	0.000	.7593406	1.185776

*Note: thereinto, h_rex, h_nfca and h_wzy, respectively means exchange rate, currency mismatch, and total foreign currency debt. h_*L1 means the corresponding variable * lag 1. Using the programs pvar2 written by Lian Yujun to estimate.*

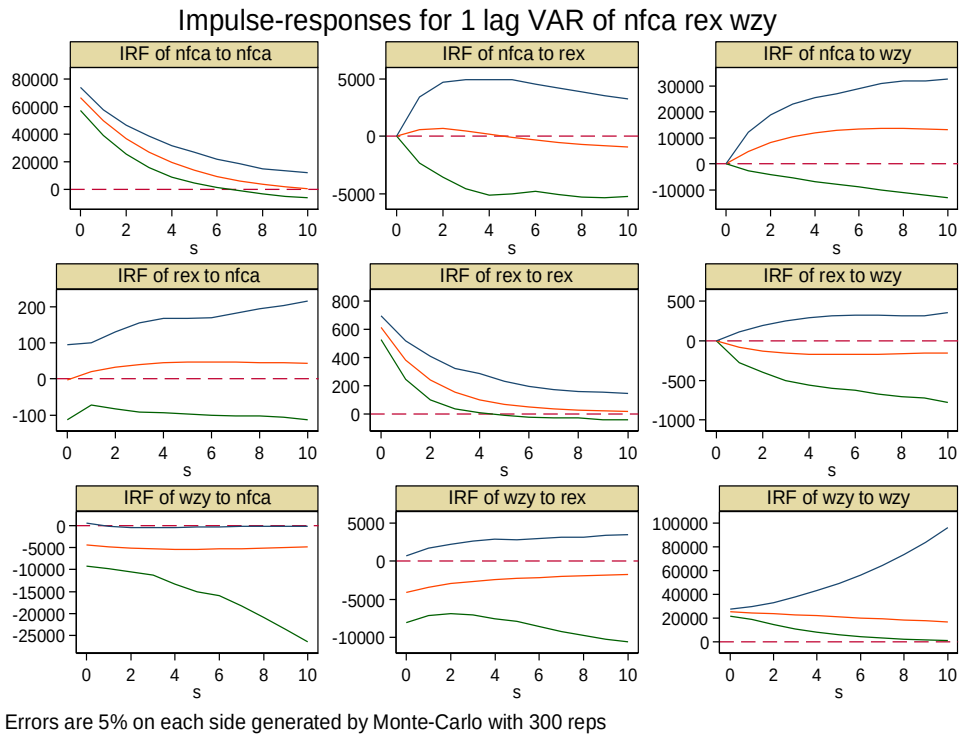

Figure 1: The figure of impulse response of the Rex, nfca and wzy

4.1. The response of the impact on exchange rate from currency mismatch

For the impact on a standard deviation of exchange rate, the response of the changes of currency mismatch are obvious in phase 2 and 3, reaching the highest value and then start to gradually decay, and disappear in phase 5 and 6, and later in a negative response. Overall, After the Asian financial crisis of 1998, the response of the impact on exchange rate from currency mismatch was not strong, and maintaining a weak state, but the duration is relatively long. The main reason is that after the Asian financial crisis, ASEAN countries had adopted a flexible and effective exchange rate mechanism to inhibit the trend of the serious devaluation of exchange rate. For example, Burma after 1997 adopted the exchange rate system of the dual market, the official exchange rate peg to the SDR and the unofficial parallel markets existed at the same time, made the exchange rate in the channel of appreciation, for the characteristics of the currency mismatch of the creditor's rights type, it can weaken the impact on currency mismatch. In the aspect of foreign exchange, after 1999, Burma had taken the measures of three aspects to increase foreign exchange reserves: First, the use of fishery,

forestry, gems resources, including the transfer of logging rights to develop foreign exchange; second, to actively increase exports and reduce imports, improve the trade surplus foreign exchange earnings;

third, actively negotiating with the state, to request derating part of foreign debt, and indirectly to make the response of the impact on exchange rate from currency mismatch reduce. Another example is Indonesia, most obvious feature of this country is that after the Asian financial crisis, the impact on currency mismatch from exchange rate was more serious, but did not last long, it benefited from the floating exchange rate system which was announced in September 2001 by this country, central bank through the interventions of currency market to make the exchange rate maintain its closed target level, which made the exchange rate of rupiah-dollar fluctuate within the range of 9000 to 10000, and the exchange rate was nearly stable. For Philippines, from 1997 to 2008, Philippines was experiencing the period of the severe fluctuation of the exchange rate which was from serious depreciation to appreciation, Philippines through the intervention of central bank to make the bilateral exchange rate keep stable, after 2005, the Philippine peso began to appreciate, foreign currency net debt fell sharply, the currency mismatch of the debt type greatly reduced, and even in 2008, it became the currency mismatch of the creditor's rights type. For Malaysia, in 2005, implemented the floating exchange rate system which was adjusted reference to a basket of currencies, the local currency had a slight appreciation, and foreign exchange reserves were ample.

Thus, the direction of the impulse response on currency mismatch from exchange rate and its continuous time are closely related to the stability or instability of the country's exchange rate and its intense fluctuation, the relative stability of the exchange rate helps to weaken the currency mismatch, the intense changes in the exchange rate can make the duration of the impulse response prolong when the currency mismatch was impacted.

4.2. The response of the impact on foreign currency debt from currency mismatch

For the impact on a standard deviation of foreign currency debt, the change response of currency mismatch is stronger and lasts longer, and always shows the response of positive effect, the response reaches the highest value in the phase 6 and 7. The expanded foreign currency debt played the role of aggravation in the accumulation of currency mismatch, and the effect and the explained ability on currency mismatch from foreign currency debt become stronger and stronger year

after year. Therefore, to weaken the currency mismatch, must reduce the phenomenon of the sudden increase of short-term foreign currency debt and the continuous accumulation of long-term foreign currency debt, and try to increase the foreign exchange reserves, which can reduce the risk of currency mismatch.

5. Conclusions

From above analysis, the characteristics and heterogeneity of conduction on currency mismatch from exchange rate were shown as follow:

First, the long-term local currency devaluation or the lack of foreign exchange reserves was the main reason of the maintaining and increase of the debt type currency mismatch. After the Asian financial crisis, the main way of ASEAN countries was that: stabilizing the exchange rate and increasing foreign exchange reserves, ample foreign exchange reserves made government have the ability to use foreign currency reserves to intervene in the foreign exchange market, and reduce the losses of the micro-economic subjects possibly suffered from the fluctuations of exchange rate, or directly bear the losses of currency mismatch for the micro-economic subjects, thereby weaken the speculative impulse of short-term capital, and reduce the accumulation of the degree of currency mismatch.

Second, the exchange rate system which maintained the exchange rate of local currency fluctuating within a narrow range helped to stabilize or weaken the level of currency mismatch. But the free floating exchange rate system, or the exchange rate system of the US dollar of excessive big weight in a basket of currencies policy which was dominated by dollar, or the exchange rate system of relaxing its crawl range increased the degree of currency mismatch.

Third, an important special feature of conduction on currency mismatch from the exchange rate of ASEAN countries was that: the large-scale foreign currency debt and the big depreciation of local currency exchange rate triggered the risk of currency mismatch of the debt type, and the high foreign debt and the currency crisis presented the linkage effects.

Fourth, the dominant factors in the accumulation of currency mismatch were caused by the endogenous changes of itself.

Fifth, in general, the exchange rate appreciation helps to weaken and stabilize the level of currency mismatch, while the exchange rate depreciation means the increase of the accumulation of currency mismatch, but the extent of the response

on the fluctuation of exchange rate from the currency mismatch of each country were quite different.

Sixth, the influence of the conduction on currency mismatch from the exchange rate of the countries with the creditor's rights type and the uncertain type was alternately positive and negative, which will not make the accumulation of currency mismatch continued to increase or decrease, and will make the currency mismatch stably fluctuated in a relative range. But the countries with the currency mismatch of the debt type did not have this phenomenon, and the effect on exchange rate from the currency mismatch of the countries with the debt type was the positive correlation.

Seventh, after the Asian financial crisis, China and ASEAN countries were active to carry out the reform of exchange rate system, although the sensitivity on exchange rate system from currency mismatch became more unstable, most countries still keep it at the level of strong elasticity.

Eighth, in the ASEAN countries, the sensitivity on the fluctuation of exchange rate from the currency mismatch of the relatively backward countries was more intense, and range was bigger. the direction of the impulse response on currency mismatch from exchange rate and its continuous time are closely related to the stability or instability of the country's exchange rate and its intense fluctuation, the relative stability of the exchange rate helps to weaken the currency mismatch, the intense changes in the exchange rate can make the duration of the impulse response prolong when the currency mismatch was impacted.

Ninth, after the Asian financial crisis of 1998, although the sensitivity on the fluctuation of exchange rate from the currency mismatch of individual relatively backward countries was increased, overall, the response of the impact on exchange rate from the currency mismatch of each country was not strong, and the duration is relatively long. The main reason is that after the Asian financial crisis, ASEAN countries had adopted a flexible and effective exchange rate mechanism to inhibit the trend of the serious devaluation of exchange rate.

Tenth, the expanded foreign currency debt played the role of aggravation in the accumulation of currency mismatch, and the effect and the explained ability on currency mismatch from foreign currency debt become stronger and stronger year after year. Therefore, to weaken the currency mismatch, must reduce the phenomenon of the sudden increase of short-term foreign currency debt and the continuous accumulation of long-term foreign currency debt, and try to increase the foreign exchange reserves, which can reduce the risk of currency mismatch.

Acknowledgement

This article is the result of the National Social Science Fund Project as "the research on the co-mobility relationship and conduction mechanism of exchange rate policy and currency mismatch" (09BJY107).

REFERENCES

[1] **Calvo, G., and Reinhart, Carmen (2002),** ***Fear of Floating*** . *The Quarterly Journal of Economics,* vol.2, pg.379- 408;

[2] **Ye Wenyu (2011),** ***Currency Mismatch and the Stability of Economy and Finance: Comparative Analysis of the Asia-pacific Experienc .*** *Financial Theory and Practice,* vol. 2, pg.47;

[3] **Guo Ping (2010),** ***Currency Mismatch-the Trouble of the Choice of Exchange Rate System in Emerging Market Countries.*** *Economy of Industrial technology,* vol.29 (9), pp.23-26;

[4] **Li Xingong (2009),** ***Currency Mismatch and the Choice of the Path of the East-Asian Financial Cooperation.*** *The Asia-pacific Economy,* vol. 3, pp. 23-27;

[5] **Wang Zhongzhao (2010),** ***The Analysis of the Co-mobility Relationship and Mechanism between Exchange Rate and Currency Mismatch .*** *International Financial Research,* vol.5, pp.30-39;

[6] **Fang Xia (2009),** ***The Research of the Anchor of East Asia Regional Monetary .*** *The Publisher of Economy and Science;*

[7] **Arellano,M.and Bond S. (1991),** ***Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Applicationto Employment Equations,*** *Review of Economic Studies,*Vol.58: 277-297 ;

[8] **Bond , S. (2002),** ***Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice****,CEMMAP Working Paper CWP09/02,Department of Economics,Institute for Fiscal Studies,London ;*

[9] **Peng Fangping, Wang Shaoping (2007),** ***The Microscopic Effects of Chinese Interest Rate Policy- The Research Based on Dynamic Panel Data Model.*** *The world of management,* vol.1, pp.24-29 ;

[10] **Carmen M .Reinhart, Kenneth S. Rogoff,** ***The Modern History of Exchange Rate Arrangements;A Reinter pretation***, *NBER working Paper* ,NO.8963.

***http://www.imf.org/external/index.htm , International Monetary Fund

*** Stata11.0 software

Schedule 1. The Currency mismatch NFCA (million dollars) and the nominal exchange rate Rex (the amount of local currency / USD) of China and ASEAN countries

year	China		Singapore		Thailand		Philippines		Laos
	NFCA	Rex	NFCA	Rex	NFCA	Rex	NFCA	Rex	NFCA
1994	116819	8.62	46578.79	1.53	-32901.90	25.15			
1995	134719	8.35	53165.67	1.42	-69890.00	24.92	-23995.3	25.71	-1966.75
1996	160158	8.31	55024.31	1.41	-81088.95	25.34	-22680.2	26.22	-1985.28
1997	237868	8.29	49576.49	1.48	-106039.17	31.36	-30095.2	29.47	-1966.29
1998	240375	8.28	-197234.28	1.67	-90637.98	41.36	-28808.8	40.89	-2124.54
1999	276625	8.28	-145949.27	1.69	-57948.76	37.81	-28833.6	39.09	-2184.75
2000	336306	8.28	-146379.17	1.72	-34132.63	40.11	-30548.0	44.19	-2097.54
2001	417924	8.28	-147194.56	1.79	-15355.30	44.43	-32404.1	50.99	-2111.04
2002	499864	8.28	-159211.91	1.79	13867.65	42.96	-31175.5	51.60	-2469.56
2003	565927	8.28	-158381.12	1.74	35208.00	41.48	-33247.2	54.20	-1650.39
2004	775838	8.28	-184448.29	1.69	50579.14	40.22	-28372.1	56.04	-1869.50
2005	1034914	8.19	-182771.76	1.66	63439.33	40.22	-22853.1	55.09	-2024.99
2006	1365890	7.97	-170761.51	1.59	83205.23	37.88	-9833.66	51.31	-2089.30
2007	1895627	7.60	-179929.51	1.51	130323.06	34.52	-2565.61	46.15	-1889.82
2008	2664695	6.95	-231840.22	1.41	178711.86	33.31	21509.01	44.47	-1936.64

Schedule 2. The Currency mismatch NFCA (million dollars) and the nominal exchange rate Rex (the amount of local currency / USD) of China and ASEAN countries

year	Laos	Burma		Vietnam		Indonesia		Malaysia	
	Rex	NFCA	Rex	NFCA	Rex	NFCA	Rex	NFCA	Rex
1995	804.7			-23620.2	11038.3				2.5
1996	921.0			-23951.0	11032.6				2.52
1997	1260.0	9372.0	6.18	-18640.0	11683.3	-106852.7	2909.4	-33058.7	2.81
1998	3298.3	17086.0	6.27	-18429.1	13268.0	-127444.0	10013.6	-19192.6	3.92
1999	7102.0	27194.0	6.22	-15889.9	13943.2	-121043.8	7855.2	-10005.1	3.80
2000	7887.6	44709.0	6.43	-1980.8	14167.7	-103466.6	8421.8	-8795.6	3.80
2001	8954.6	60184.5	6.68	716.7	14725.2	-77035.2	10260.9	20605.2	3.80
2002	10056.3	74399.6	6.57	-342.8	15279.5	-69083.4	9311.2	20226.7	3.80
2003	10569.0	54563.7	6.08	-1925.8	15509.6	-67236.9	8577.1	37566.7	3.80
2004	10585.4	94268.2	5.75	-1543.4	15746.0	-70712.1	8938.9	73178.4	3.80
2005	10655.2	112804.3	5.76	1830.4	15858.9	-55672.1	9704.7	78803.5	3.79
2006	10159.9	147917.4	5.78	7611.0	15994.3	-25102.0	9159.3	96029.4	3.67
2007	9603.2	202375.6	5.56	14442.9	16105.1	-2715.7	9141.0	119171.3	3.44
2008	8744.1	289318.3	5.39	20864.0	16302.3	-903.6	9699.0	103573.8	3.34

Schedule 3. The foreign debt balance of China and ASEAN countries (million dollars)

countries / year	China wzy1	Singapore Wzy2	Thailand Wzy3	Philippines Wzy4	Laos Wzy5
1994		7649	64867	37351	2080
1995		8368	100832	37697	2165
1996		9803	108742	39883	2263
1997	3785.28	13803	109276	42972	2327
1998	29786.20	266860	105062	46146	2451
1999	32246.91	223834	95051	50997	2535
2000	35056.77	220298	79715	51206	2508
2001	36208.77	222073	67509	51900	2494
2002	34353.02	234393	59459	53645	2948
2003	38652.89	245233	51909.12	57395	2194
2004	45910.35	287785	51443.94	54846	2521
2005	50708.00	300359	52161.78	54186	2707
2006	60486.70	313551	61027.31	53367	3037
2007	75828.51	340996	61873.26	54938	3337
2008	91381.35	420461	65224.56	53856	3501

Schedule 4. The foreign debt balance of China and ASEAN countries (million dollars)

countries / year	Burma Wzy6	Vietnam Wzy7	Indonesia Wzy8	Malaysia Wzy9
1994	6555	24800		28984
1995	5771	25428	124398	34343
1996	5184	26255	128985	39673
1997	5503	21777	157316	47228
1998	5647	22458	151460	42409
1999	6004	23210	151460	41903
2000	5928	12825	144286	41874
2001	5670	12585	133817	45089
2002	6583	13344	132966	48272
2003	7319	15991	136845	48557
2004	7239	18049	139555	52156
2005	6645	19211	132794	51981
2006	6828	20202	130800	56491
2007	7373	24222	140783	53717
2008	7963	21816	149141	70801

The introduction of schedules 1 to 3: The formula

NFCA=NFAMABK+NBKA$-NBKL$-IB$.

Indicator explanation: 1. NFAMABK means the foreign net assets of the monetary authorities and deposit money banks, NBKA$ means the foreign currency (multinational) assets of non-banking sector, NBKL$ means the foreign currency (multinational) debt of non-banking sector, IB$ means the amount of outstanding international bonds. Data sources: The NFAMARK of each country is from the statistical data (IFS) of the International Monetary Fund (IMF). As NBKL$ and IB$ are not available, instead of using the balance of the foreign debt. Philippines: NBKA$ and the balance of foreign debt are from Bangko central ng Pilipinas(bsp) Annual; Laos: NBKA$ is from bank of Lao PDR Annual, and the balance of foreign debt is from Asian development bank(ADB); Malaysia: NBKA$ is from central bank of Malaysia statistics, and the balance of foreign debt is from development

bank(ADB); Burma: the balance of foreign debt is from Asian development bank(ADB); Thailand: the balance of foreign debt is from bank of Thailand(bot) commercial banks sectoral balance sheet& foreign exchange position of commercial banks; Singapore: NBKA$ is from MONTHLY statistics bulletin of MAS, and the balance of foreign debt is from the statistical data (IFS) of the International Monetary Fund (IMF); Vietnam: the balance of foreign debt is from Asian development bank(ADB).

2. The nominal exchange rate Rex of each country is from the statistical data (IFS) of the International Monetary Fund (IMF).