



CHAPTER 2

AN APPROACH ON IMPACT OF EXCHANGE RATE AND IMPORT DEMAND FUNCTION

2.1 Impact of Exchange Rate: Theoretical Approach

2.1.1 Trade and Economic Growth

After 160 years traditional trade theory was challenged in the late 1970s by Krugman (1990) called the “new trade theory”. While the traditional trade theory provides a basic philosophy for advocating free trade, the new trade theory suggests a more complex view. In this section, arguments will be based on theoretical work on trade, income level and growth using both static and dynamic analysis.

2.1.1.1 Static Aspect: Output Level and Trade

-Traditional Trade Theory

Gains from free trade arise as a result of more efficient resource reallocation. Rather than producing everything, a country is better off producing what it is best at and purchasing the rest. In other words, a country can gain by producing goods in which it has comparative advantage over other countries in exchange for goods in which it has comparative disadvantage. International trade allows a country to consume outside its production possibilities frontier.¹

The conclusion is that trade brings prosperity to countries and to the world as a whole in terms of an increase in the output level. In general, trade restrictions such as tariffs or quotas lead to dead weight losses² as a result of economic inefficiency. However, there are some situations such as externalities and cases of market failure, in which trade restriction can improve economic efficiency. In summary, restriction generally, except in some well-understood cases, is a bad thing and hence free trade is a recommended policy in the traditional trade model.

¹ Kiriya Kulkolkarn and Tanapong Potipiti. Trade and Economic Growth. International Trade:ERTC Economic Monitor, Nov-Dec 2000, p40-47.

² The reduction in consumers and producers surplus occurs when production is restricted to less than the optimum efficient level under free trade.

-New Trade Theory³

The new trade theory introduces a whole set of new possibilities and concerns. It agrees that differences between countries (comparative advantage) are one reason for free trade but it adds the opportunity to exploit increasing returns through exports as another important reason. The potential gains from trade are even larger in a world of increasing returns and therefore, the support for free trade is stronger. However, new trade models show that it is possible, not certain, that such tools as export subsidies and temporary tariffs may shift world specialization in a way that is favorable to the protecting nation.⁴

2.1.1.2 Dynamic Aspects: Output Growth and Trade

-Neo-classical Trade Theory

In neo-classical growth models, with exogenous technological change and diminishing returns to reproducible factors of production, trade has only a level effect but has no effect on the long-term steady state of output growth. However, there may be growth effects during the transition to the steady state. These transitional effects could be positive or negative depending on how the long-term level of output is affected by trade restrictions. In other words, trade may affect the convergence rate and the duration period it takes to move toward a steady state.⁵

-New Trade Theory or Endogenous Growth Theory

In recent endogenous growth models or new growth theory, trade can affect long-term growth through its impact on technological change. Openness to trade provides access to imported inputs, which embody new technology, increases the effective size of the market for producers (increasing returns to scale effect). And gives a country's specialization in research-intensive production (innovation, imitation and learning by doing effect). New growth theory has extended the neo classical framework to endogenous and examines the various channels of the growth process.

³ Kiriya Kulkolkarn and Tanapong Potipiti. Trade and Economic Growth, International Trade:ERTC Economic Monitor, Nov-Dec 2000, p.40-47.

⁴ Ibid.

⁵ Ibid.

Yet new growth theories do not predict that trade will obviously raise economic growth. Openness may lead to an increase in competition. Increased competition could discourage innovation by lowering expected profits.

In sum, an argument supporting a negative relationship between trade barriers and output growth rates cannot be made. It is not easy to determine a clear theoretical link between openness and growth when learning, technological change and market imperfections are taken into account. Unlike physical capital and labour, openness is very abstract.⁶

2.1.2 Exchange Rate

In order to complete the international transactions, people need to sell one currency and buy another. Exchange rate is derived from demand and supply of foreign exchange as figure 2.1

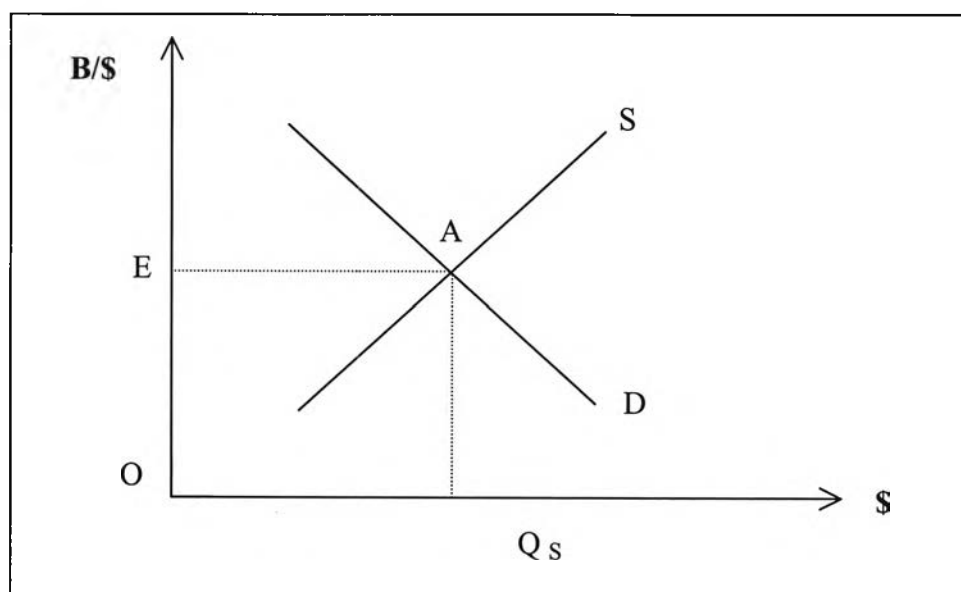


Figure 2.1 Exchange Rate Equilibrium

The demand for foreign exchange is derived from the domestic demand for foreign goods, services, and financial assets, whereas the supply of foreign exchange is similarly derived from the foreign demand for goods, services, and financial assets

⁶ Ibid.

coming from this country. Exchange rate equilibrium occurs at point A, Demand for \$ is equal to Supply for \$

We can separate exchange rate regime in to 3 systems:

- 1) Fixed exchange rate regime
- 2) Freely flexible exchange rate regime
- 3) Managed exchange rate regime

-Fixed Exchange Rate Regime

This system is sometimes called “The Bretton Wood system”, “ The IMF system”, “The Dollar system”, or “The Gold Exchange Standard”

If a country had a fixed exchange rate and a payments deficit, as shown in the figure 2.2 there would be an excess demand for foreign currencies in the exchange market. The central bank would then be obligated to buy up the excess domestic currency and sell the foreign currencies that were in excess demand. Such transactions would either reduce the country’s foreign exchange assets or increase foreign official holdings of domestic currency reserves. If the central bank failed to intervene to purchase the excess domestic currency, the price of foreign exchange would rise to the equilibrium level shown in Figure 2.2, and a fixed exchange rate would no longer exist. It is the willingness of central banks to maintain a commitment to purchase or sell foreign currencies as needed to maintain unchanging exchange rates that differentiates a fixed parity system from a world of flexible exchange rates.

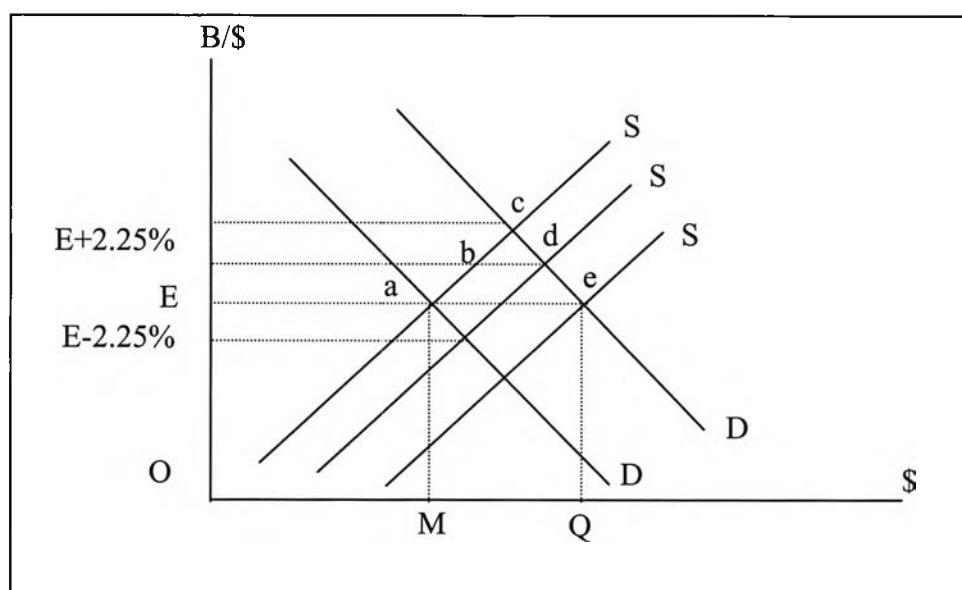


Figure 2.2 A Fixed Price of Foreign Exchange

A fixed price of foreign exchange of E produces an excess demand for foreign exchange of MQ , which the central bank must absorb through exchange market intervention. Allowing the price of foreign exchange to rise to $E+2.25\%$, which is the price that would prevail if floating exchange rates, existed.⁷

-Freely flexible exchange rate regime

In theory, a flexible exchange rate system means that there is no central bank intervention in the exchange market and that rates are determined the way prices of common stocks are settled: through shifts in supply and demand without official stabilization.

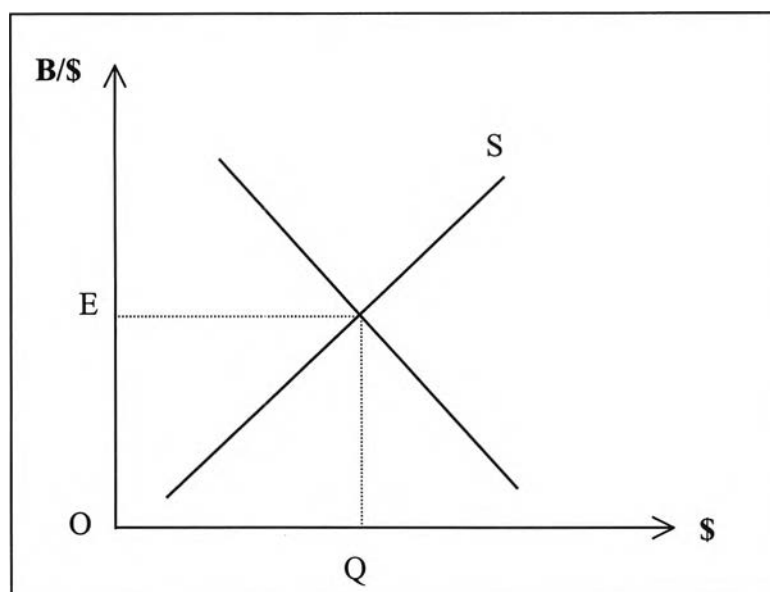


Figure 2.3 Freely Flexible Exchange Rate

-Managed Floating Exchange Rate System

The policy of intervention in foreign exchange markets by monetary authorities to smooth out short-run fluctuations without attempting to affect the long-run trend in exchange rates.

⁷ Gerald M. Meier, *International Economics. The theory of policy* (Oxford University press, 1980).

2.1.3 Devaluation

A condition that arises when a government or central bank change a fixed exchange rate or parity for its currency in a direction that reduces the value of the local currency compared to foreign currencies.⁸

Devaluation, on the other hand, refers to the deliberate (policy) increase in the exchange by the nation's monetary authorities from one fixed or pegged level to another. However, since both a depreciation and devaluation operate on prices to bring about adjustment in the nation's current account and the balance of payments, they are both referred to as the price adjustment mechanism.

2.1.3.1 Devaluation and the Trade Balance⁹

The effect of devaluation to the trade balance could be done in the case of small country, for example, in the case of devaluation of Thai Baht. This effect can be derived through the elasticity of the trade balance with respect to the exchange rate:
Etb

The elasticity of the trade balance with respect to the exchange rate needs the relationship between changing in exchange rate and elasticity of demand and supply for foreign exchange:

$$TB_B = S_B - D_B = V_X - V_M = P_X^B X - P_M^B M \quad (6)$$

$S_B = V_X$ is the supply for foreign exchange in current account or value of export.

$D_B = V_M$ is demand for foreign exchange in current account or value of import.

Differentiate equation (6) gets,

$$dT_B = dS_B - dD_B \quad (7)$$

$$d(T_B/V_M) = dS_B/V_M - dD_B/V_M \quad (8)$$

⁸ Robert M. Dunn JR., James C. Ingram, "International Economics" (New York: John Wiley & Sons, Inc., 1996), p. 543.

⁹ Dominick Salvatore, International Economics (New York: Macmillan publishing Company, 1983.), p.335.

Assume that,

$E_{tb} = (dT_B/V_m)/(dr/r)$ is elasticity of trade balance to exchange rate (or price of foreign exchange in Baht / Dollars US.

$E_s = (dS_B/S_B)/(dr/r)$ is elasticity of supply for foreign exchange (or value of Export) to Exchange rate.

$E_d = (dD_B/D_B)/(dr/r)$ is elasticity of demand for foreign exchange (or value of import) to exchange rate.

So when divide (8) with dr/r we get:

$$E_{tb} = (V_x/V_m)E_s - E_d \quad (9)$$

$$\text{And } E_{tb} = (V_x/V_m) \frac{d_x + 1}{(d_x/S_x) - 1} - \frac{S_m + 1}{(S_m/d_m) - 1} \quad (10)$$

Which $d_x =$ Elasticity of demand for export

$S_x =$ Elasticity of supply for export

$d_m =$ Elasticity of demand for import

$S_m =$ Elasticity of supply for import

From the equation number 10, the more elasticity of demand of import and export goods, the better balance of trade.

In case of small country, both import and export prices would be considered as stable, in term of foreign money rate, and elasticity of foreign countries, which are elasticity of export demand (d_x) and elasticity of import supply (s_m), would be considered as indefinite. Therefore, Baht devaluation would highly affect the increase of demand and the decrease of supply in the same direction as the value of the Baht decreased. And balance of trade would get better.

$$s_m = -d_x = \infty$$

so $E_{tb} - (V_x/v_m) S_x - D_m > 0$

The case of small country is realistic and can be used with many countries even some big countries, which are price-takers in the international trade market.¹⁰

¹⁰ Gerald M. Meier, International Economics, The theory of policy (Oxford University press, 1980).

2.1.3.2 Importing

-As Graph C, Baht devaluation shifts, in term of Baht, the supply line of import upward because foreign exporters would sell goods with higher price to compensate their lower income from the Baht devaluation. And when import prices, in term of Baht, are higher, Thai people would decrease there purchasing, which effects moving along demand of importing.

-As Graph D, Baht devaluation shifts the demand line of import downward, which shows that Thai people decrease their purchasing import goods and lead the import decreased because the value U.S. Dollar is higher and Thai people has to pay more.

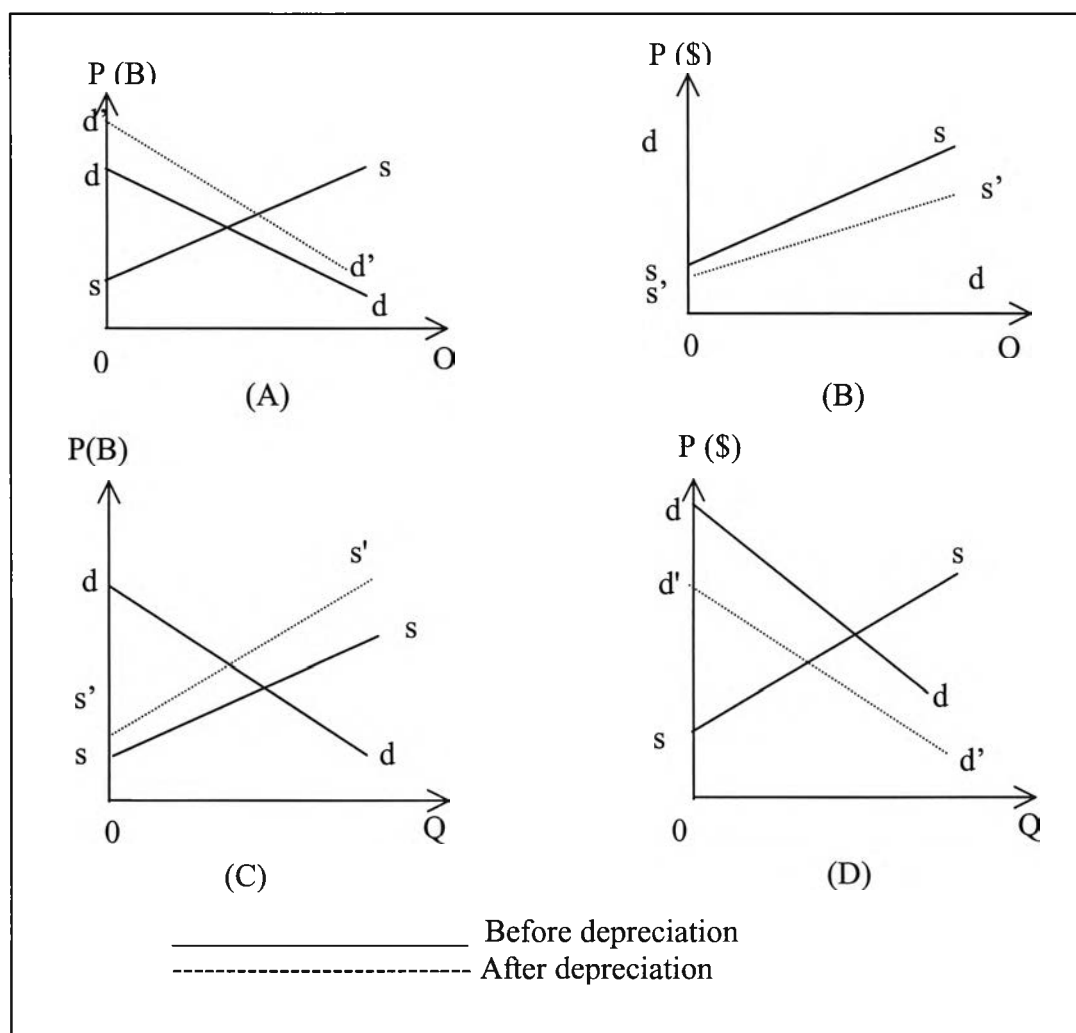


Figure 2.4 Devaluation

However, Baht devaluation may lead the import, in term of Baht, as the same, lower or higher ratio. It depends on elasticity of import.

If elasticity were equal 1, Importing would be the same

If elasticity were less than 1, Importing would be higher

If elasticity were more than 1, Importing would be lower

Therefore, the result depends on elasticity of export and import goods. However, according to small country case, money devaluation would affect balance of trade to be better.

2.2 Import Demand: Related Studies

There is the researches concern with this thesis separate into 2 parts.

2.2.1 The Openness and Economic Growth

They interested in GDP and import-export or Term of Trade or sometime balance of Trade.

*Supaporn Kajornsirisakul (1990)*¹¹ studied the factors affecting import value of Thailand. This study analyzed consumer goods, capital goods, intermediate products and raw materials and fuel and lubricant were major part of import value.

The price elasticity of imported consumer goods value was positive and greater than one. This implied that high import price caused more percentage of import value. Such phenomenon could be caused by lack of domestic substitute goods for imported consumer goods.

The price elasticity of imported capital goods value was minus whereas the domestic fixed capital formation elasticity was positive and less than one. The domestic capital formation thus had minor role to imported capital goods value.

For intermediate products and raw materials, the price elasticity was negative while the domestic fixed capital formation elasticity was positively greater than one.

¹¹ Supaporn Kajornsirikul. A study of factors affecting import value of Thailand. Master's Thesis, Faculty of Economics, Kasetsart University, May 1990.

The last items to be analyzed in this thesis were fuel and lubricant imported to Thailand. The price elasticity, growth rate of gross domestic product elasticity and number of vehicle elasticity on fuel and lubricant imported value were all positively greater than one.

The recommendations based on this study were to reduce high value of imported consumer goods higher import tax on such imported goods should be introduced together with the promotion of domestic consumer goods production to Thai producers. The consideration of reasonable prices and qualities were also necessary. The imported value of capital good could be reduced by promotion of machines and tools productions in the country. Starting from uncomplicated tools and then gradually developed to complicate ones. To reduce intermediate products and raw materials, Thailand should revise her production structure in accordance with her domestic raw material and should produce some intermediate products for her own uses. To reduce the imported value of fuel and lubricant, the government should control the number of new vehicles each year, let the real fuel price to vehicle owners without supporting any burden, and improving traffic system in big cities.

*Kriengsak Yothaprasert (1972)*¹² Kriengsak studied the relationship by using Econometric Method.

This study separate in to two part which :

1.) Finding the demand for imports of Thailand in four categories by Economic classification which are, consumer goods. Intermediate products and Raw materials, capital goods, Fuel and lubricant. This 4 equations use “Single equation” and use Double Logarithm in each equation.

$$\ln M = \ln A + b \ln Y + c \ln P_i^m (1 + t_i) / P_i^d$$

Which M_i = Index of import volume of good I and use Fisher Model

Y = Income variables which are GDP, government and Private sector expenditure and capital formation

P_i^m = Index of import price of good I and use Fisher model.

P_i^d = Domestic Price of import goods in each categories.

T_i = import tax rate of good I (income tax rate divide by value of import goods in each category)

¹² Kriengsak Yothaprasert. An Empirical study of Thailand's Import: 1960-1970. Master's Thesis, Faculty of Economics, Thammasat University, 1972.

This study use annual data from 1960 – 1972 . The assumption of this study is the price elasticity and income elasticity are constant all the study time and estimate this demand for import model with ordinary least squares. The result of this study is

Table 2.1 Elasticity of Import Demand using annual data from 1960 - 1972

Categories of goods	Price	Income
1. consumer goods	-1.130	+ 0.783
2. intermediate products and raw materials	+ 0.337	+ 1.175
3. capital goods	- 1.124	+ 0.914
4. Fuel and lubricant	- 1.243	+ 1.157
5. Other imports	n.9	+ 1.159
Total imports	- 0.9	+ 1.292

Sources: Kriengsak Yothaprasert An Empirical study of Thailand's Import: 1960-1970. Master's Thesis, Faculty of Economics, Thammasat University, 1972.

2.) In the second part of this study, Kriengsak evaluated the policy such as :
The change in import goods tax, devaluation or appreciation of Baht and the effect of Economic growth to the imports.

*Olarn Chaipravat, Kanitta Messook, and Siri Ganjarerndee (1979)*¹³ created Demand for import model for Thailand. They separate import goods in four categories by economic classification (1) Intermediate products and raw materials (2) capital goods (3) consumer goods (4) service goods

This study use annual data from 1760 – 1976 and conclude the result of model in the Table 2.2

Table 2.2 Elasticity of Import Demand using annual data from 1760 - 1976

Categories of goods	Price	Income
1. Intermediate products and raw materials and Fuel	- 0.9934	+ 0.8175
2. Capital goods	- 1.1903	- 0.9366
3. Consumer goods	- 0.8609	+ 0.7705
4. Service goods	- 1.0956.	+ 1.4666

Sources: Olarn Chaipravat, Kanitta Mesook, and Siri Ganjarerndee. "Bank of Thailand model of the Thai Economy." Bangkok: Dept. of Economic Research, Bank of Thailand, 1979.

¹³ Olarn Chaipravat, Kanitta Mesook, and Siri Ganjarerndee. "Bank of Thailand model of the Thai Economy." Bangkok: Dept. of Economic Research, Bank of Thailand, 1979.

*Khan and Montiel (1987)*¹⁴ studied the improvement in terms of trade is brought about by an increase in export prices. The improvement in the terms of trade creates an excess demand in the market for nontraded goods, so that the real exchange rate appreciates. The new higher real income from the terms of trade improvement will induce the private sector to save, and this accumulation of wealth is associated with a further real appreciation.

2.2.2 Exchange rate or devaluation to the import-export or Balance of payment

Most of Thai studies pay more attention on the nominal exchange rate as followings.

*Suchat Sakkarnkoson (1982)*¹⁵ studied the effect of monetary policies on the balance of payments and international reserves by investigating the process of adjustments on the current account and capital account when there is disequilibrium in the money market.

*Amnaj Srisuksan (1988)*¹⁶ studied on the measurement for appropriate exchange rate in the form of bath price index and investigated factors affecting the exchange rate determination of Thailand.

*Yenko(1982)*¹⁷ explain that the degree of exchange rate flexibility is rather influenced by the economic characteristics of the economy pertaining to its capital market and trade such as capital market integration, openness, price elasticity of trade, diversification of the external sector, and sources of shocks. Yenke employed these criteria to make implication of the appropriate degree of exchange rate flexibility in ASEAN¹⁸ countries.

¹⁴ Mohsin S. Khan and Peter J. Montiel. "Real Exchange Rate Dynamics in a Small, Primary-Export Country." *International Monetary Fund Staff Papers* 34, No.4 (December 1987), p. 681-710.

¹⁵ Suchat Sakkarnkoson. "The Effects of Monetary Policies on the Balance of Payments of Thailand," Master's Thesis, Thammasat University (in Thai), 1988

¹⁶ Amnaj Srisuksan. "Index of Baht Value and Exchange Rate Determination of Thailand," Master's Thesis, Thammasat University (in Thai), 1988.

¹⁷ Aleth U. Yenke, "Exchange Rate Regimes of ASEAN Countries; Critical Evaluation," Research Notes and Discussions Paper No. 30, Institute of Southeast Asian Studies, January, 1982.

¹⁸ Indonesia, Malaysia, Philippines, Singapore, and Thailand.

According to Yenko(1989), countries whose domestic financial market is well integrated with international markets ensure high capital mobility or substitutability between domestic and foreign assets. Thus, the adjustments of the balance of trade and balance of payments go through capital movement rather than changes in the exchange rate, so a floating rate will be stable at least in the short run. This criterion indicated that Singapore could adopt floating system and that Malaysia and Thailand should favor less flexibility. However, it was doubtful which system Indonesia and Philippines should adopt.

In Indonesia, the foreign assets attributed to the high income from oil, so foreign currency activities may be restricted to trade and may not reflect a well-integrated capital market. In Philippines, large stock of foreign assets came from the presence of offshore banking units and might be insulated as a result of foreign exchange controls.

Yenko further described that if countries have high degree of openness, the exchange rate changes would largely affect the domestic price level, high cost of exchange rate adjustment, and the advantage of domestic money. Therefore, according to the openness criterion, all of the five ASEAN countries favor less flexible system.

In the LDCs, the price elasticity of demand for imports is relatively low due to very limited substitutability between domestically produced goods and imported goods whereas the price elasticity of supply of exports is low in the short run since their major exports are primary products whose production is time consuming. Therefore, large exchange rate changes and long time periods would be required to produce the desired trade balance criterion implied that Philippines, Singapore and Thailand should adopt less flexible system.

On the contrary, Indonesia and Malaysia were in doubt since they had some market power, so their trade balance could be responsive to exchange rate changes. Therefore, a floating rate could be relatively stable at least in the long run.

The commodity concentration of trade for ASEAN was also higher than that of the average floater, especially in the case of Indonesia and Singapore who have large petroleum exports. Therefore, no ASEAN countries should adopt floating system.¹⁹

If the disturbances, which most significantly affect the economy, came from domestic origin, exchange rate should not be used as a corrective measure. Thus, a less flexible exchange rate system is appropriate. This is a result of the multiplier effects. The multiplier of a less flexible system, $1/(MPS+MPM)$ for the fixed system, is lower than that under the more flexible system, $1/MPS$. Thus, the fixed system should be used to stabilize the economy from the internal disturbances. However, the fixed system was inappropriate to stabilize the economy from the external disturbances due to its limited fluctuation of the exchange rate to correct the disturbances. On the contrary, a more flexible exchange rate system is suitable to stabilize the economy from the external disturbances. Thus, the flexible exchange rate system should be adopted because the flexible system could insulate the economy from the disturbances that occur in the rest of the world. The sources of shocks criterion indicated that Malaysia and Singapore, which had low inflation rate, could employ flexible system, a situation contrary to that of Indonesia, Philippines and Thailand.

In general, the four ASEAN countries, Indonesia, the Philippines, Thailand and to a lesser extent Malaysia, possessed the characteristics of peggers. Singapore faced a conflict in the policy implications derived from the determinants described above since it has a relatively integrated capital market to ensure short run stability the floating system, but the economy is so open that adjustment costs can be very high. Therefore, the need for weighting the various determinants is required to determine the suitable degree of flexibility.

*Goldstein(1984)*²⁰ recognized that most developing countries and many smaller industrial countries adopted limited flexibility. This limitation is due to “Structural” factors. Besides, the stability of exchange rates in LDCs depends on the stability in the exchange rates of the major currencies too. Goldstein also provided four criteria to

¹⁹ Most LDCs whose economy is undiversified, then external disturbances can lead to disruptive exchange rate changes under a floating system.

²⁰ Morris Goldstein, “whether the Exchange Rate System?” *Finance and Development* 21 (June 1984): 2-6.

evaluate the exchange rate regime. First, does the system help or hinder macroeconomic policy in pursuit of fundamental domestic economic objectives (price stability, sustainable growth, and high employment)? Second, how effective is the system in affect the volume and efficiency of world trade and capital flows (and thereby resource allocation in the international economy at large)? Fourth, how robust or adaptable is the system to significant changes in the global economic environments?

Another study which employed costs and benefits approach to evaluate the exchange rate system is *Black(1976)*²¹. The study classified the exchange rate policy into five categories; exchange controls or import quotas plus reluctant adjustment of single currency peg, optimally chosen and manage single currency peg by means of reserves or borrowing, pegging to the SDR, the managed float designed to stabilize the effective exchange rate or move it in the direction indicated by differential inflation rates, and the free market floating policy. The criteria employed to evaluate the system are the level of market institution development required or the need for investment in exchange market facilities, saving on holding or borrowing reserve, the size of resource misallocation, the variance of the effective exchange rate the variance in the relative price of traded goods, the strength of black market, the size of a political costs, and costs of exchange control.

According to *Quirk (1989)*²², there were many factors affecting the choice of exchange rate regime such as amount of international reserves, the efficiency of controls, the fiscal and monetary situation, and the political and social consequences in the transitional period, and the international obligations of IMF. Furthermore, the choice of regimes in developing countries depends on the smoothing path of the exchange rate in the face of exogenous shocks, the basis of performance, and the institutional weaknesses.

²¹ Stanley W. Black, "Exchange Policies for Less Developed Countries in a World of Floating Rates," Seminar Paper No. 53, Institute for International Economic Studies, Stockholm, Sweden, March 1976.

²² Peter J. Quirk, "Issues of Openness and Flexible for foreign Exchange Systems," IMF Working Paper (WP/89/3), January 1989.

In Thailand, *Wibulsawasdi (1988)*²³ studied about the effective exchange rate of the baht. The calculation was based on the exchange rate of large group (27 countries of Thailand to assign the weights. There were four weights applied to calculate the indexes; that is, import weights, export weight, trade weight, and average weight. The quarterly data of the exchange rates were employed from 1970 to 1977 whereas 1973 was used as the base period. Therefore, the index was equal to 100 in 1973. The baht was appreciated when compared with the currencies of these trading partner countries if the index was greater than 100 and vice versa.

The result was that indexes from import weight were likely to be the highest whereas those from export weight tended to be the lowest. The indexes from trade weight and from average weight were relatively equal because they lied between import weight indexes were treated as good representative to measure the average value of the baht in that period. The trade weight indexes of the large group indicated that the baht was appreciated about 7% and its fluctuation was less than 1% during 1970 to mid 1972. The appreciation declined to 3.4% in the first quarter of 1973. The baht was depreciated about 1.7-2% during the second quarter and the third quarter of 1973. During mid 1973 to mid 1976, the value of the baht tended to increase and to reach the highest level in mid 1976, about 5.6% appreciation, After mid 1976, the appreciation of the baht steady declined until it was depreciated about 3.1% in the fourth quarter of 1977.

The study further adjusted the nominal indexes with the relative consumer price index; that is, the nominal indexes were transformed into the real indexes. The real trade weight effective exchange rate index indicated the overvaluation of baht in 1974 during 1970-1972. The baht was closed to equilibrium in 1973. The overvaluation in 1974 was a result of the excessive appreciation of baht. Baht was undervalued in 1975 and 1976, however, it was closed to equilibrium. After mid 1976 to 1977, the undervaluation of the baht was a result of the depreciation and relative low domestic price.²⁴

²³ Chaiyawat Wibulsawasdi. Economic Policies of Thailand During 1980-1987. "Bank of Thailand Monthly Bulletin 28 (28 February 1988): 57-72. (in Thai).

²⁴ Ibid.

In 1992 Wibulsawasdi suggested that there are many objectives to be considered when the authority decides to fix bath to U.S. dollar. If the authority fixes the value of the baht to the U.S. dollar when the value of U.S. dollar depreciates, it will be suitable to relieve the trade deficit. However, if the economy faces the import inflation authority should fix the value of the bath to U.S. dollar when the value of U.S. dollar appreciates. Therefore, both cases offer positive effects to the economy. During the time when the value to bath fixed to U.S. dollar, the Thai foreign exchange market needed more confidence in the monetary system. Therefore, the authority employed rate management policies because the exchange rate management policies have great impacts on the economy.