



THE EQUILIBRIUM EXCHANGE RATE OF THAI BAHT
BY APPLYING REAL EFFECTIVE EXCHANGE
RATE THEORY

by

Ms. Suphaluck Paramasawat

A Final Report of the Three-Credit Course
CE 6998 Project

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
in Computer and Engineering Management
Assumption University

November, 2001

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The Graduate School of Assumption University has approved this final report of the three-credit course, CE 6998 PROJECT, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer and Engineering Management.

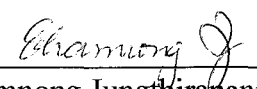
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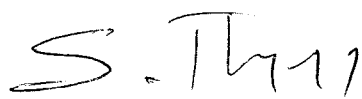
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ABSTRACT

After the exchange rate system of Thailand had changed from Basket of Currencies to Managed Float System, the consequence was the inconsistency of the exchange rate. Studying the Equilibrium Exchange rate was very important. The main objective of this study was to analyze and study the measurement of Equilibrium Exchange Rate for Thai based on the Purchasing Power Parity Approach by adjusting the Nominal Effective Exchange Rate Index in order to get the Real Effective Exchange rate Index (REER). The REER can be used to indicate the Equilibrium Exchange Rate for Thai Baht and also measure the change in the country 's competitiveness.

The study was based on 2 cases, setting REER against 1995 base year and REER against 1999 quarter 4 as the base year. The result demonstrated that when used base year 1995, the REER in 1999 was lower than 100. It implied that the Thai Baht was undervalued. However, comparing with the fourth quarter of 1999 base year, the exchange rate for Thai Baht was overvalued.

The study indicated that REER with different base year, would have different value, however, it still has the same direction of movement. Therefore, measuring the Equilibrium Exchange Rate in the long run by using the PPP Approach, the change will be influenced by the Money Market Mechanism, Equilibrium in the long run reflects the equilibrium exchange rate at that period. The REER can be higher or lower than 100. The data during January until December of 1999, The REER was stable but the stability in the short term did not mean that the exchange rate was at its long-term equilibrium.

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I. INTRODUCTION

1.1 Description of Exchange rate in Thailand

Foreign exchange rates effect every walk of life, not just financial market. Exchange rate movement can be significant for companies engaged in international trade exposed to revenues and costs in foreign currency or compete with foreign firms. After years of a relatively “fixed” exchange rate regime where the government announced exchange rate daily, Asian countries particular Thailand, woke up one day and found their currency floating. An end to be the fixed currency regime disrupted capital flow and put on local interest rate in short run leading to dull blow financial economic crisis, not only Thailand, but also spillover throughout the region. Most people are deeply shocked at high volatility of floating exchange rates. The result was what began as turmoil in the currency market, will have a serious impact on inflation, employment, investment and economic growth. Many wonder how owner can live with a floating currency regime. Some are concerned with what foreign exchange rate fundamentally should be.

As Thailand is regarded as a small open economy, the exchange rate, as it has blamed, has gained a relatively important role in the Thai economy and financial system through international trade and investments. With such rapidly changing economic and financial environment together with the fact that the exchange rate system of Thailand was changed from basket –pegging regime to managed floating regime on July 2,1997, the role of exchange rate has become increasingly important as a channel through which monetary policy may have affected the real sector and , thus , the inflation rate

It has been argued that this new exchange rate regime has given the Thai monetary authorizer more room to maneuver its exchange rate policy in the sense that an adjustment in the nominal exchange rate under the new regime can be implemented

continuously in response to developments at home and abroad and without the risk of being politically unacceptable which was the case under the previous exchange rate regime.

Under the present circumstance where the understanding of the monetary transmission mechanism in Thailand is still far from complete, an evaluation of the stance of monetary policy needs to rely on various sets of monetary indicators. It has been claimed, in evaluating the economic information and inflation level in Thailand, the Thai authorities rely on a variety set of economic information and monetary indicators, including in particular the manufacturing production index, import and export levels, the behavior of interest rate and exchange rate monetary aggregated, credit aggregates, to name but a few. The various economic information and monetary indicators mentioned.

In the near future, however, the authorizers will tend to encounter with an increasing difficulty in evaluating and estimating the effects that the interest rate and the exchange rate have on the inflation. This is because the facts of the changes in the interest rate and exchange rate on the direction of the inflation tend to change rather easily, as a result of shocks from both domestic and internal factors.

In year 2001, the Thai economy is still recovering with the estimated growth. Four years after Thailand floated the Baht be sailed into a disastrous economic crisis dragging the regime with it. Our economic still depends on the global economy. IMF demonstrates that the world economic will slow down from 4.8% in year 2000 to 3.2% in year 2001. The main reason is the slow down of economy of the developed countries especially USA , England and Japan.

In this report, I will study the evolution of exchange rate system in Thailand during 1955 –1963 which is the ancient exchange rate system and during 1963 –1977

which is par value system by using the data descriptive approach. Thailand exchange rate system was under the fixed exchange rate system during 1979- 1984. Those were separated into 2 periods, during 1979-1981 we switched to the daily fixing system. For the year during 1981- 1984 the exchange rate was quoted by the exchange equalization funds and also peg to the US \$. Then it turned to be the basket of currencies system during 1984- 1997 when exchange rate did not volatile (+/- not more than 5%) and since July 2, 1997 it changed to be as the managed float system which a lot of volatility has been found especially, it will affect the export and import business. Although today Thai currency is dramatically stable, the main issue that everybody always asks is what the appropriate level of exchange rate system for Thai Baht is.

Therefore, the purpose of the project is to find out the appropriate exchange rate for Thai currency which is one major problem, not only as the index to indicate the competitive of one country but also as the guideline for the exchange rate policy.

In order to measure the equilibrium exchange rate of one currency, there are many theories; for example Macroeconomic Balance approach or Long-Run Equilibrium. The Exchange Rate that can be applied are as follows:

- (1) Relative Purchasing power Parity (PPP)
- (2) Underlying Payment Disequilibrium Approach (UPD)
- (3) Asset –market Disturbances Approach (AMD)

In this case, I will use the theory of Relative Purchasing Power Parity (PPP) approach, which is widely used and it demonstrates the tendency of appropriate long run equilibrium exchange rate

1.2 Research Objectives

- (1) To study the evolution of Thai currency exchange rate.
- (2) To study the appropriate level of exchange rate for Thai currency by using the concept of equilibrium exchange rate applied from the Purchasing Power Parity (PPP) Approach.

1.3 Scope of Study

I will study the equilibrium of Thai Baht exchange rate against 9 countries, which are USA, England, Japan, Netherlands, Germany, Malaysia, Hong Kong, China and Singapore in Thailand market.

Most data come from the Monthly Economic and financial statistics from Bank of Thailand and International Monetary Fund (IMF); I will divide those information into 2 parts

- (1) The data in year 1994 –1996, analyzed yearly
- (2) The data in year 1997 – Quarter 2 of 2001 – analyzed quarterly

First of all, I will find the Nominal Effective Exchange Rate Index (NEER) for Thai Baht and then adjust the index for Thai bath by using the Relative Consumer Price Index among countries. Lastly I will get the Real Effective Exchange Rate Index (REER) for Thai Bath. This index is appropriate for measuring the level of exchange rate for Thai Bath.

In order to construct the index for Thai currency, I need the information as follow:

- (1) Currencies included in the index. In this case, I will choose by considering the foreign trade of those countries and Thailand which are USA, Japan, Singapore, England, Netherlands, Germany, Hong Kong, China and Malaysia. Because foreign trade among these countries are in the firstly of

Purchasing Power Parity Approach (PPP) which is widely used for finding the Real Effective Exchange rate Index.

Theory of Purchasing Power Parity

$$S = \frac{P}{P^*}$$

S = The relative consumer price level in two countries measured in common currency (exchange rate)

P = Domestic price index

P* = Foreign price index



9 rank 's foreign trade and total foreign trade value is 70% of all trade balance between Thai and other countries.

(2) Weighted value of trade which the information come from the foreign trade of Thailand from year 1994 –2001 and I will divide that into 3 categories as follows:

- (a) Import weighted
- (b) Export Weighted
- (c) Total Trade Weighted (Import plus Export)

(3) Base period, I will consider 2 periods:

First Period

I will use the year 1995 as the base for calculating the index for Thai Baht. In that period, our Thai currency was stabilized and also the basket of currency was used.

Second Period

I will use quarter 4 of year 1999 as the base because the Thai currency is much more stable after the turmoil of managed float system.

- (4) Currencies used: the currencies of the following 9 countries which are USA, Japan, Singapore, England, Netherlands, Germany, Hong Kong, China and Malaysia, and areas are used since they are the major destinations of Thai import and export. The exchange rate of each currency uses the exchange rate of Commercial Bank in Bangkok Metropolis released by the Bank of Thailand (selling, buying and monthly average)
- (5) For the relative price index between countries, I will use the consumer price index which will demonstrate the price in many countries.

In this project, I will use quantitative analysis to study the appropriate exchange rate by applying the Nominal Effective Exchange Rate Index for Thai Baht and also use

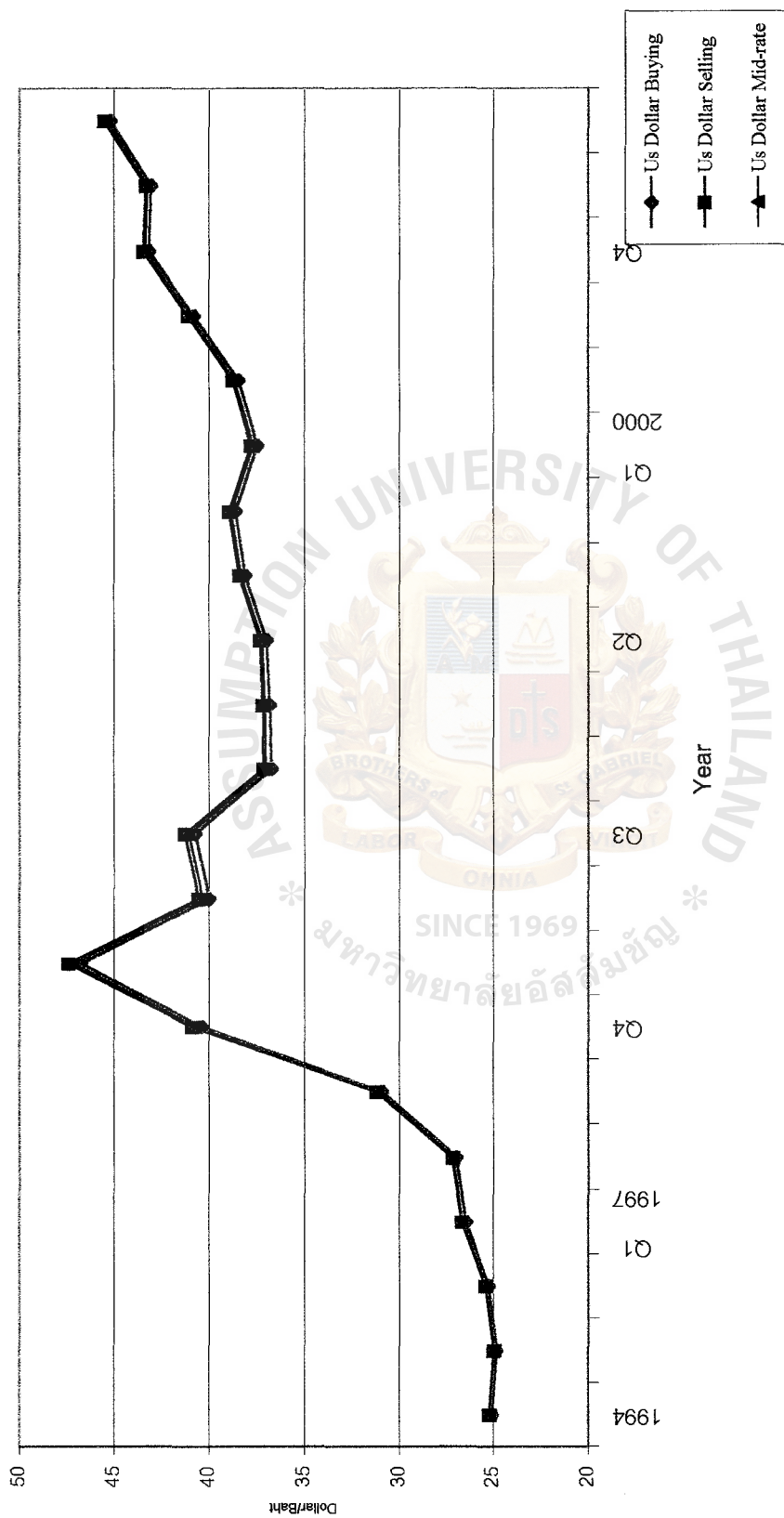


Figure 1.1. Graph of Exchange rate between US Dollar and Baht.

II. LITERATURE REVIEW

2.1 Introduction to Purchasing Power Parity

Purchasing power parity (PPP) is a theory of exchange rate determination and a way to compare the average costs of goods and services between countries. The theory assumes that the actions of importers and exporters, motivated by cross country price differences, induces changes in the spot exchange rate. In another vein, PPP suggests those transactions on a country's current account which affect the value of the exchange rate on the foreign exchange market. This contrast with the interest rate parity theory which assumes that the actions of investors, whose transactions are recorded on the capital account, induces changes in the exchange rate. PPP theory is based on an extension and variation of the "law of one price" as applied to the aggregate economy. To explain the theory, it is best, first to review the idea behind the law of one price.

The Law of One Price (LOOP)

The law of one price says that identical goods should sell for the same price in two separate markets when there are no transportation costs and no differential taxes applied in the two markets. Consider the following information about movie video tapes sold in the US and Mexican markets.

Table 2.1. Spot Exchange Rate

| | |
|---|---------|
| Price of videos in US market ($P_{\v) | \$20 |
| Price of videos in Mexican market (P_p^v) | p150 |
| Spot exchange rate ($E_{p/\$}$) | 10 p/\$ |

The dollar price of videos sold in Mexico can be calculated by dividing the video price in pesos by the spot exchange rate as shown:

$$\frac{P_p^v}{E_{p/\$}} \left[\frac{\text{peso / video}}{\text{peso / \$}} = \frac{\text{peso}}{\text{video}} \times \frac{\$}{\text{peso}} = \frac{\$}{\text{video}} \right] = \frac{150}{10} = \$15 / \text{video}$$

To see why the peso price is divided by the exchange rate (rather than multiplied) notice the conversion of units shown in the brackets. If the law of one price held, then the dollar price in Mexico should match the price in the US. Since the dollar price of the video is less than the dollar price in the US, the law of one price **does not hold** in this circumstance. The next question to ask is what might happen as a result of the discrepancy in prices. Well, as long as there are no costs incurred to transport the goods, there is a profit-making opportunity through trade. For example, US travelers in Mexico who recognize that identical video titles are selling there for 25% less might buy videos in Mexico and bring them back to the US to sell. This is an example of "goods arbitrage." An arbitrage opportunity arises whenever one can buy something at a low price in one location and resell at a higher price and thus make a profit.

Using basic supply and demand theory, the increase in demand for videos in Mexico would push the price of videos up. The increased supply of videos on the US market would force the price down in the US. In the end the price of videos in Mexico may rise to, say, 180 pesos while the price of videos in the US may fall to \$18. At these new prices the law of one price holds since,

$$\frac{P_p^v}{E_{p/\$}} = \frac{180}{10} = \$18 = P_{\v$

The idea between the law of one price is that identical goods selling in an integrated market, where there are no transportation costs or differential taxes or subsidies, should sell at identical prices. If different prices prevailed then there would be

profit-making opportunities by buying the good in the low price market and reselling it in the high price market. If entrepreneurs acted in this way, then the prices would converge to equality.

Of course, for many reasons the law of one price does not hold even between markets within a country. The price of beer, gasoline and stereos will likely be different in New York City than in Los Angeles. The price of these items will also be different in other countries when converted at current exchange rates. The simple reason for the discrepancies is that there are costs to transport goods between locations, there are different taxes applied in different states and different countries, non-tradable input prices may vary, and people do not have perfect information about the prices of goods in all markets at all times. Thus, to refer to this as an economic "law" does seem to exaggerate its validity.

From Law of one price to PPP

The purchasing power parity theory is really just the law of one price applied in the aggregate, but, with a slight twist added (more on the twist a bit later). If it makes sense from the law of one price that identical goods should sell for identical prices in different markets, then the law ought to hold for all identical goods sold in both markets.

First, let's define the variable $CB_{\$}$ to be the cost of a basket of goods in the US denominated in dollars. For simplicity we could imagine using the same basket of goods used in the construction of the US consumer price index ($CPI_{\$}$). The CPI uses a market basket of goods which are purchased by an average household during a specified period.

The basket is determined by surveying the quantity of different items purchased by many different households. One can then determine, on average, how many units of bread, milk, cheese, rent, electricity, etc. are purchased by the typical household. You

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might imagine, it's as if all products are purchased in a grocery store, with items being placed in a basket before the purchase is made. $CB_{\$}$ then represents the dollar cost of purchasing all of the items in the market basket. We shall similarly define CB_{p} to be the cost of a market basket of goods in Mexico denominated in pesos. then it should hold for the market baskets as well. In other words,

$$\frac{P_p^v}{E_{p/\$}} = P_{\$}^v \Rightarrow \frac{CB_p}{E_{p/\$}} = CB_{\$}$$

Absolute Purchasing Power Parity

Now if the law of one price holds for each individual item in the market basket, rewriting the right-hand side equation allows us to put the relationship in the form commonly used to describe **absolute purchasing power parity**. Namely,

$$E_{\$/p}^{PPP} = \frac{CB_{\$}}{CB_p}$$

If this condition holds between two then we would say that PPP is satisfied. The condition says that the PPP exchange rate (pesos per dollars) will equal the ratio of the costs of the two market baskets of goods denominated in local currency units. Note that the reciprocal relationship is also valid.

$$E_{p/\$}^{PPP} = \frac{CB_p}{CB_{\$}}$$

Because the cost of a market basket of goods is used in the construction of the country's consumer price index, PPP is often written as a relationship between the exchange rate and the country's price indices. However, it is not possible merely to

substitute the price index directly for the cost of the market basket used above. To see why, let 's review the construction of the CPI.

Relative Purchasing Power Parity

There is an alternative version of the PPP theory called the "relative PPP theory." In essence this is a dynamic version of the absolute PPP theory. Since absolute PPP suggests that the exchange rate may respond to inflation, we can imagine that the exchange rate would change in a systematic way given that a continual change in the price level (inflation) is occurring. In the relative PPP theory, exchange rate changes over time are assumed to be dependent on inflation rate differentials between countries according to the following formula:

$$\frac{E_{\$/\text{P}}^2 - E_{\$/\text{P}}^1}{E_{\$/\text{P}}^1} = \pi_{\text{P}} - \pi_{\$}$$

Here the percentage change in the \$ value between period 1 and 2 is given on the left hand side. The right hand side gives the differences in the inflation rates between Mexico and the US, evaluated over the same time period. The implication of relative PPP is that if the Mexican inflation rate exceeds the US inflation rate, then the dollar will appreciate by that differential over the same period. The logic of this theory is the same as in absolute PPP. Importers and exporters respond to variations in the relative costs of market baskets so as to maintain the law of one price, at least on average. If prices continue to rise faster in Mexico than in the US, for example, price differences between the two countries would grow and the only way to keep up with PPP is for the dollar to appreciate continually versus the peso.

The PPP relationship becomes a theory of exchange rate determination by introducing assumptions about the behavior of importers and exporters in response to

changes in the relative costs of national market baskets. Recall, in the story of the law of one price, when the price of a good differed between two country's markets, there was an incentive for profit-seeking individuals to buy the good in the low price market and resell it in the high price market. Similarly, if a market basket, containing many different goods and services, costs more in one market than another, we should likewise expect profit-seeking individuals to buy the relatively cheaper goods in the low cost market and resell them in the higher priced market. If the law of one price leads to the equalization of the prices of a good between two markets, then it seems reasonable to conclude that PPP, describing the equality of market baskets across countries, should also hold.

However, adjustment within the PPP theory occurs with a twist compared to adjustment in the law of one price story. In the law of one price story, goods arbitrage in a particular product was expected to affect the prices of the goods in the two markets. The twist that's included in the PPP theory is that arbitrage, occurring across a range of goods and services in the market basket, will affect the exchange rate rather than the market prices.

Source of the Departure from PPP

Source of the departure from PPP can be viewed as two major aspects: structural and transitory sources. The departures from PPP can be “structure” in the sense that they arise systematically in response to new and lasting changes in the equilibrium relative prices. The deviation from PPP can also occur in a “transitory” fashion as a result of disturbances to which the economy adjusts with differential speeds in commodities and asset markets. These qualifications imply that the restricted or even weak form of PPP cannot be expected to hold closely.

2.2 Problems with the PPP Theory

The main problem with the PPP theory is that the PPP condition is rarely satisfied within a country. There are quite a few reasons that can explain this and so, given the logic of the theory, which makes sense, economists have been reluctant to discard the theory on the basis of lack of supporting evidence. Below we consider some of the reasons PPP may not hold.

(1) Transportation costs and trade restrictions

Since the PPP theory is derived from the law of one price, the same assumptions are needed for both theories. The law of one price assumed that there are no transportation costs and no differential taxes applied between the two markets. These means that there can be no tariffs on imports or other types of restrictions on trade. Since transport costs and trade restrictions do exist in the real world this would tend to drive prices for similar goods apart. Transport costs should make a good cheaper in the exporting market and more expensive in the importing market. Similarly, an import tariff would drive a wedge between the prices of an identical good in two trading countries' markets, raising it in the import market relative to the export market price. Thus the greater are transportation costs and trade restrictions between countries, the less likely for the costs of market baskets to be equalized.

(2) Costs of Non-Tradable Inputs

Many items that are homogeneous, nevertheless sell for different prices because they require a non-tradable input in the production process. As an example consider why the price of a McDonald's Big Mac hamburger sold in downtown New York city is higher than the price of the same

product in the New York city suburbs. Because the rent for restaurant space is much higher in the city center, the restaurant will pass along its higher costs in the form of higher prices. Substitute products in the city center (other fast food restaurants) will face the same high rental costs and thus will charge higher prices as well. Because it would be impractical (i.e., costly) to produce the burgers at a cheaper suburban location and then transport them for sale in the city, competition would not drive the prices together in the two locations.

(3) Perfect information

The law of one price assumes that individuals have good, even perfect, information about the prices of goods in other markets. Only with this knowledge will profit-seekers begin to export goods to the high price market and import goods from the low priced market. Consider a case in which there is imperfect information. Perhaps some price deviations are known to traders but other deviations are not known. Or maybe only a small group of traders know about a price discrepancy and that group is unable to achieve the scale of trade needed to equalize the prices for that product. (Perhaps they face capital constraints and can't borrow enough money to finance the scale of trade needed to equalize prices). In either case, traders without information about price differences will not respond to the profit opportunities and thus prices will not be equalized. Thus, the law of one price may not hold for some products which would imply that PPP would not hold either.

(4) Index-Number Problem

As can be expected, PPP will conform differently depending on the particular price index chosen for empirical testing. Generally, the most popular price indices are consumer price index (CPI), Wholesale price index (WPI) and GDP deflators. Theoretically, the price index used for PPP analysis must accurately reflect the prices at which transactions occur in a free market. Actual price index should be calculated from individual prices of only a sample of commodities rather than all commodities in the economy.

(5) Other market participants

Notice that in the PPP equilibrium stories, it is the behavior of profit-seeking importers and exporters that forces the exchange rate to adjust to the PPP level. These activities would be recorded on the current account of a country's balance of payments. Thus, it is reasonable to say that the PPP theory is based on current account transactions. This contrasts with the interest rate parity theory in which the behavior of investors seeking the highest rates of return on investments motivates adjustments in the exchange rate. Since investors are trading assets, these transactions would appear on a country's capital account of its balance of payments. Thus, the interest rate parity theory is based on capital account transactions. It is estimated that there are approximately \$1 trillion dollars worth of currency exchanged every day on international Forex markets. That's one-eighth US GDP, which is the value of production in the US in an entire year! Plus, the \$1 trillion estimate is made by counting only one side of each currency trade. Thus, that's an enormous amount of trade. If one considers the total

amount of world trade each year and then divide by 365, one can get the average amount of goods and services traded daily. This number is less than \$100 billion dollars. This means that the amount of daily currency transactions is more than ten times the amount of daily trade. This fact would seem to suggest that the primary effect on the daily exchange rate must be caused by the actions of investors rather than importers and exporters. Thus, the participation of other traders in the foreign exchange market, who are motivated by other concerns, may lead the exchange rate to a value that is not consistent with PPP.



2.3 PPP as a Theory of Exchange Rate Determination

The PPP relationship becomes a theory of exchange rate determination by introducing assumptions about the behavior of importers and exporters in response to changes in the relative costs of national market baskets. Recall, in the story of the law of one price, when the price of a good differed between two country's markets, there was an incentive for profit-seeking individuals to buy the good in the low price market and resell it in the high price market. Similarly, if a market basket, containing many different goods and services, costs more in one market than another, we should likewise expect profit-seeking individuals to buy the relatively cheaper goods in the low cost market and resell them in the higher priced market. If the law of one price leads to the equalization of the prices of a good between two markets, then it seems reasonable to conclude that PPP, describing the equality of market baskets across countries, should also hold.

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The PPP Equilibrium Story

To see why the PPP relationship represents an equilibrium we need to tell an equilibrium story. An equilibrium story in an economic model is an explanation of how the behavior of individuals will cause the equilibrium condition to be satisfied.

$$E_{p/\$}^{PPP} = \frac{CB_p}{CB_{\$}}$$

The equilibrium condition is the PPP equation developed above: The endogenous variable in the PPP theory is the exchange rate. Thus, we need to explain why the exchange rate will change if it is not in equilibrium. In general there are always two versions of an equilibrium story, one in which the endogenous variable ($E_{p/\$}$ here) is too high, and one in which it is too low.

PPP Equilibrium Story 1 - Let's consider the case in which the exchange rate is too low to be in equilibrium. This means that,

$$E_{s/p} < \frac{CB_{\$}}{CB_p} \longrightarrow CB_{\$} E_{p/\$} < CB_p$$

Where $E_{p/\$}$ is the exchange rate that prevails on the spot market and, since it is less than the ratio of the market basket costs in Mexico and the US, is also less than the PPP exchange rate. The right-hand side of the expression is rewritten to show that the cost of a market basket in the US evaluated in pesos, $CB_{\$}E_{p/\$}$, is less than the cost of the market basket in Mexico also evaluated in pesos. Thus, it is cheaper to buy the basket in the US, or, more profitable to sell items in the market basket in Mexico.

The PPP theory now suggests that the cheaper basket in the US will lead to an increase in demand for goods in the US market basket by Mexico, and, as a consequence, will increase the demand for US dollars on the foreign exchange market. Dollars are needed because purchases of US goods require US dollars. Alternatively, US exporters will realize that goods sold in the US can be sold at a higher price in Mexico. If these goods are sold in pesos, the US exporters will want to convert the

proceeds back to dollars. Thus, there is an increase in US dollar demand (by Mexican importers) and an increase in peso supply (by US exporters) on the Forex. This effect is represented by a rightward shift in the US dollar demand curve in the adjoining diagram. At the same time, US consumers will reduce their demand for the pricier Mexican goods. This will reduce the supply of dollars (in exchange for pesos) on the Forex which is represented by a leftward shift in the US dollar supply curve in the Forex market

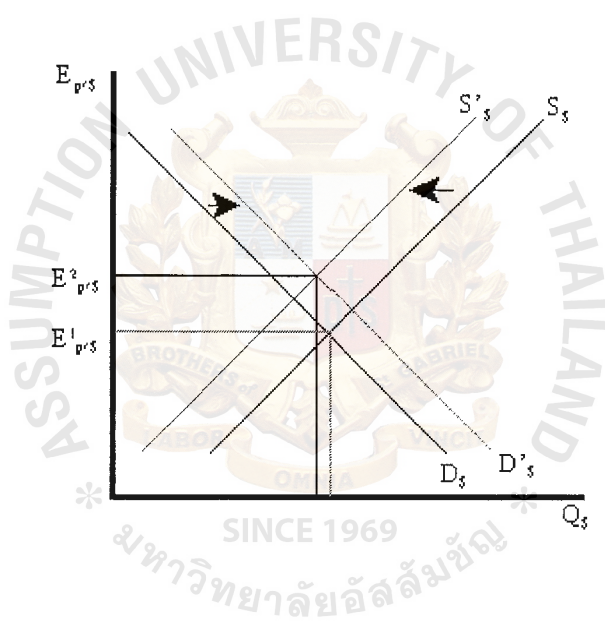


Figure 2.1. PPP Equilibrium Story 1.

Both the shift in demand and supply will cause an increase in the value of the dollar and thus the exchange rate, $E_{p/\$}$, will rise. As long as the US market basket remains cheaper, excess demand for the dollar will persist and the exchange rate will continue to rise. The pressure for change ceases once the exchange rate rises enough to equalize the cost of market baskets between the two countries and PPP holds.

PPP Equilibrium Story 2 - Now let's consider the other equilibrium story, that is, the case in which the exchange rate is too high to be in equilibrium. This implies that,

$$E_{p/\$} > \frac{CB_p}{CB_\$} \Rightarrow CB_\$ E_{p/\$} > CB_p$$

The left-hand side expression says that the spot exchange rate is greater than the ratio of the costs of market baskets between Mexico and the US. In other words the exchange rate is above the PPP exchange rate. The right-hand side expression says that the cost of a US market basket, converted to pesos at the current exchange rate, is greater than the cost of a Mexican market basket in pesos. Thus, on average US goods are relatively more expensive while Mexican goods are relatively cheaper.

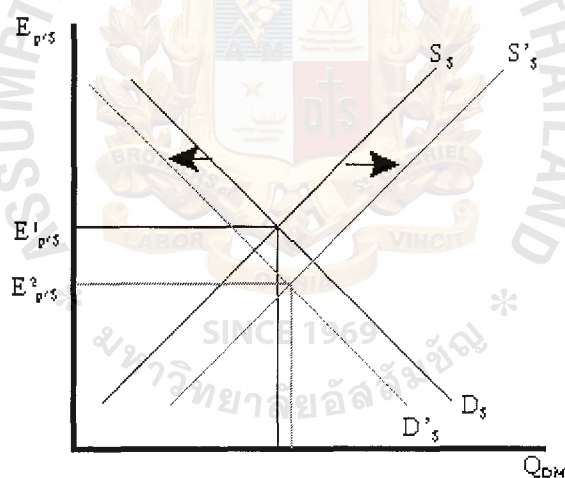


Figure 2.2. PPP Equilibrium Story 2.

The price discrepancies should lead consumers in the US, or importing firms, to purchase less expensive goods in Mexico. To do so, they will raise the supply of dollars in the Forex in exchange for pesos. Thus, the supply curve of dollars will shift to the right as shown in the adjoining diagram. At the same time, Mexican consumers would refrain from purchasing the more expensive US goods. This would lead to a reduction in demand for dollars in exchange for pesos on the Forex. Hence the demand curve for

dollars shifts to the left. Due to the demand decrease and the supply increase, the exchange rate, $E_{p/\$}$, falls. This means that the dollar depreciates and the peso appreciates.

Extra demand for a pesos will continue as long as goods and services remain cheaper in Mexico. However, as the peso appreciates (the \$ depreciates) the cost of Mexican goods rises relative to US goods. The process ceases once the PPP exchange rate is reached and market baskets cost the same in both markets.

Adjustment to Price Level Changes Under PPP.

In the PPP theory, exchange rate changes are induced by changes in relative price levels between two countries. This is true because the quantities of the goods are always presumed to remain fixed in the market baskets. Therefore, the only way that the levels between two countries. This is true because the quantities of the goods are always presumed to remain fixed in the market baskets. Therefore, the only way that the cost of the basket can change is if the goods' prices change. Since price level changes represent inflation rates, this means that differential inflation rates will induce exchange rate changes according to the theory.

If we imagine that a country begins with PPP, then the inequality given in equilibrium story #1, $CB_{\$}E_{P/\$} < CB_P$, can arise if the price level rises in Mexico (peso inflation), if the price level falls in the US (\$ deflation), or if Mexican inflation is more rapid than US inflation. According to the theory, the behavior of importers and exporters would now induce a dollar appreciation and a peso depreciation. In summary, an increase in Mexican prices relative to the change in US prices (i.e., more rapid inflation in Mexico than in the US) will cause the dollar to appreciate and the peso to depreciate according to the purchasing power parity theory.

Similarly , if a country begin with PPP , then the inequality given in equilibrium

story #2, $CB_{\$} E_{p/\$} > CB_P$, can arise if the price level rises in the US (\$ inflation), the price level falls in Mexico (peso deflation) or if US inflation is more rapid than Mexican inflation. In this case, the inequality would affect the behavior of importers and exporters and induce a dollar depreciation and peso appreciation. **In summary, more rapid inflation in the US would cause the dollar to depreciate while the peso would appreciate.**



2.4 The Consumer Price Index (CPI) and PPP

The CPI is an index that measures the average level of prices of goods and services in an economy relative to a base year. In order to track only what happens to prices, the quantities of goods purchased is assumed to remain fixed from year to year. This is accomplished by determining, with survey methods, the average quantities of all goods and services purchased by a typical household during some period of time. The quantities of all of these goods together is referred to as the average market basket. For example the survey might find that the average household in one month purchases 10 gallons of gas, 15 cans of beer, 3.2 gallons of milk, 2.6 pounds of butter, etc., etc. The basket of goods would also contain items like health and auto insurance, housing services, utility services and many other items. We can describe the market basket easily as a collection or set of quantities ($Q_1, Q_2, Q_3, \dots, Q_n$). Here Q_1 may be the quantity of gasoline, Q_2 the quantity of beer, etc. The set has "n" different quantity entries implying that there are n different items in the market basket.

The cost of the market basket is found by surveying the average prices for each of the n products in the market in question. This survey would yield a collection or set of prices ($P_1, P_2, P_3, \dots, P_n$). The cost of the market basket, then, is found by summing the product of the price and quantity for each item. That is, $CB = P_1Q_1 + P_2Q_2 + P_3Q_3 + \dots + P_nQ_n$ or .

$$CB = \sum_{i=1}^n P_i Q_i$$

The first year in which the index is constructed is called the base year. Suppose 1996 is the base year for the US. Let CB_{YY} represent the cost of the market basket evaluated at the prices that prevail in year YY. (e.g., CB_{00} is the cost of a market basket evaluated in 2000 prices) The CPI is derived according to the following formula,

$$\mathbf{CPI_{YY} = \frac{CB_{YY}}{CB_{96}} \times 100}$$

Where CPI_{YY} is the CPI in the year YY. The term is multiplied by 100 by convention, probably because it reduces the need to use digits after a decimal point. Notice that the CPI in the base year is equal to 100, i.e., $CPI_{96} = 100$, because $CB_{96}/CB_{96} = 1$. This is true for all indices—they are by convention set to 100 in the base year. The CPI in a different year (either earlier or later) represents the ratio of the cost of the market basket in that year relative to the cost of the same basket in the base year. If in 1997 the cost of the market basket rises, then the CPI will rise above 100. If the cost of the market basket falls then the CPI would fall below 100. If the CPI rises it does not mean that the prices of all of the goods in the market basket have risen. Some prices may rise more, some less. Some prices may even fall. The CPI measures the average price change of goods and services in the basket. The inflation rate for an economy is the percentage change in the CPI during a year. Thus if CPI_{96} and CPI_{97} are the price indices on January 1st, 1996 and 1997 respectively, then the inflation rate during 1996, 96, is given by,

$$\pi_{96} = \frac{CPI_{97} - CPI_{96}}{CPI_{96}} \times 100$$

PPP using the CPI

$$\frac{CPI_p^{97}}{CPI_{\$}^{97}} = \frac{\frac{CB_p^{97}}{CB_p^{96}}}{\frac{CB_{\$}^{97}}{CB_{\$}^{96}}} = \frac{CB_p^{97}}{CB_{\$}^{97}} \frac{CB_{\$}^{96}}{CB_p^{96}} = \frac{CB_p^{97}}{CB_p^{96}} \frac{CB_{\$}^{96}}{CB_{\$}^{97}}$$

The Purchasing power parity relationship can be written using the CPI with some small adjustments. First, consider the following ratio of 1997 consumer price indices between Mexico and the US,

Given that the base year is 1996, the ratio is written in terms of the market basket costs on the right-hand side and then rewritten into another form. The far right-hand side expression now reflects the purchasing power parity exchange rates in 1997 divided by the PPP exchange rate in 1996, the base year. In other words,

$$\frac{CPI_p^{97}}{CPI_{\$}^{97}} = \frac{\frac{CB_p^{97}}{CB_{\$}^{96}}}{\frac{CB_p^{96}}{CB_{\$}^{96}}} = \frac{{}^{97}E_{p/\$}^{PPP}}{{}^{96}E_{p/\$}^{PPP}}$$

In general then if you want to use the consumer price indices for two countries to derive the PPP exchange rate for 1997 you must apply the following formula, derived by rewriting the above,

$${}^{97}E_{p/\$}^{PPP} = {}^{base}E_{p/\$}^{PPP} \times \frac{CPI_p^{97}}{CPI_{\$}^{97}}$$

Where it represents the PPP exchange rate that prevails in the base year between the two countries. Note that in order for this formula to work correctly, the CPIs in both countries must share the same base year. If they did not, a more complex formula would need to be derived.

2.5 The concept of Real Effective Exchange Rate

Recently the concept of Real Effective Exchange rate (REER) has become a significant subject of concern. It is used as a criterion from gauging trade competitiveness among trading partners. The real exchange rate can be defined by two approaches

First:

Based on traded and non-traded commodities, REER is defined as the relative domestic price of tradable commodities (P_t) to non-tradable commodities (P_n):

$$REER = P_t / P_n$$

The resource allocation between tradable and non-tradable sectors can be considered. A decrease in REER means that the production of non-tradable is relatively more profitable including resource movements from tradable to non-tradable goods sector.

Second:

Real Exchange Effective rate is a traditional, but still popular, definition of the real exchange rate, which bases on the purchasing power parity approach. According to this approach, the PPP real exchange rate:

$$E = \sum_{i=1}^n R_i W_i$$

E = the real exchange rate of any one currency compared to the group of foreign currencies

R_i = the ratio of foreign exchange rate level divided by the domestic exchange rate

$$W_i = \text{the weight load denoted by } \sum_{i=1}^n W_i = 1$$

N = Number of the countries

The weights utilized to construct the index are based on the trade flows between one country and its trading partners. Trade-weights, determined by the value of both a country's exports and imports, are the most common types of weights utilized internationally, although some countries use export-weights or import-weights only. In essence, these indices measure the overall (international) competitiveness of exports and non-exported goods that face competition in domestic markets from trading partner imports.

Effective exchange rate (EER) indices measure a country's international competitiveness relative to that of its major trading partners. In general, a distinction is made between nominal and real effective exchange rate indices. The nominal effective exchange rate (NEER) index reflects the effects of changes in the value of a country's currency resulting from variations in the value of the currencies of its major trading partners relative to a given base year.

The real index is obtained by adjusting the nominal index for changes in relative prices/costs of the country's major trading partners. The NEER index is constructed as a ratio of one country exchange rate to a weighted average of the exchange rates of its major trading partners. The real effective exchange rate (REER) which have one base year, are based on relative movements in national consumer (or retail) price indices (CPI) Consumer price indices are employed as a measure of the prevailing level of prices in each country and provide an estimate of the cost of goods originating from each country. Therefore, the EER indices estimate the price or cost competitiveness of goods produced in one country relative to those of its major trading partners.

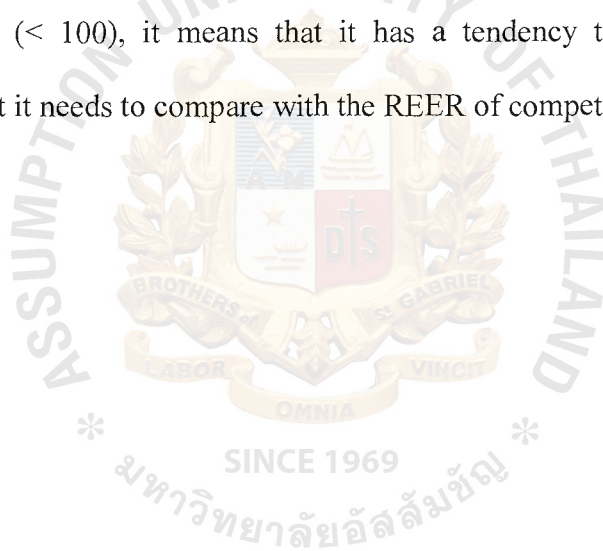
$$\text{REER} = \text{NEER} / \text{RCPI}$$

REER = Relative effective exchange rate

NEER = Nominal effective exchange rate

RCPI = Relative consumer price index between the foreign price and domestic price

The index from the calculation will be equal to 100 as base period, which shows the suitable level of exchange rate. IF the REER is equal to 100, it shows that the exchange rate is in the appropriate level, but if REER is more than 100 (>100), it means that there is a tendency to appreciate in currency or overvalue. In contrast if REER is less than 100 (< 100), it means that it has a tendency to devalue of currency or undervalue but it needs to compare with the REER of competitor.



2.6 How to Construct the Real Effective Exchange Rate

The construction of real effective exchange rate index requires number of decisions. Because many of the decisions have more than one defensible alternatives, it is not surprising that a number of effective exchange rate indexes are used. Six decision exchange rate are examined:

- (1) Which formula is used to calculate the average?

There are 2 methods of calculating an average value that are Arithmetic mean which compute a simple average or geometric mean. Each method compares the effective value of Baht with its value in a given period

- (2) Which foreign currencies is used

Ideally, an effective exchange rate for the Baht should include all currencies for which the Baht is exchanged. Such an ideal however, is tempered by the reality that the construction of the index requires timely, reliable data. As a result most indexes are limited to the currencies of the principal industrial economies. Normally the countries that choose, should involve in the majority of Thai volumes trade and shouldn't be lower than 70% of all total trade. Each country has a well developed foreign exchange market with exchange rates that depend on the primarily in the supply and demand decisions of private individuals and firms.

- (3) Which Measure of Economic Activity is used as the basis of weighting the importance of individual currencies

Deciding how many countries to include in the index also requires decisions concerning how much importance should be attached to the currency from a particular country. The relative importance of currency is determined by its weight in the average.

Because effective exchange rate indexes are most often constructed to measure changes in a country's international competitiveness, generally some measure of international trade is used to calculate the weights. For this reason, effective exchange rates are frequently termed trade weighted exchange rates. International trade, however, is not only measure of international economic activity that could be used. The exchange value of the Baht is determined by supply and demand forces involving the international exchange rate of goods, services and asset.

Though trade flows are used to calculate the weights given to each currency in an effective exchange rate index, based on international financial movements, one could use international capital flows to determine the weights. Both the absolute levels and the rapid growth rates of international capital flows suggest that capital flows might currently more importance determinant of exchange rates than trade flows. Thus using the capital flows, the currencies of the countries with larger investment and portfolio flows are more important in determination of the value of the Baht than the currencies of the countries with smaller investment and portfolio activity.

A key reason trade is used for weighting purposes is that, although trade data subject to errors, they are much easier to obtain on a timely basic than capital flows

(4) How to calculate the weights for individual currencies?

Another issue in weighting the importance of a specific currency involves the selection of weight scheme. If Effective Exchange Rate Index is to reflect changes in a country 's international competitiveness, then

ideally the weights should be chosen to reflect the responsiveness of country's trade flows to changes in exchange rates.

Three Method of Weighting as follows:

(1) Bilateral Weighted Method (Arithmetic average)

Each Country is weighted by the proportion of its share of total trade flows to and from Thai used to construct the index.

$$W_i = \frac{THXi + THMi}{\sum_{i=1}^n (THXi + THMi)}$$

W_i = The weight for country i

$THXi$ = The export from Thailand to country i

$THMi$ = The import from Thailand to country i

n = Number of countries that used to construct index

(2) Multilateral Weighted Method (Geometric average)

The price of home country in term of foreign currencies, relative to the base period. Each Country is weighted by the proportion of its share of total trade flows throughout the World. The weight for each country i is the sum of country i's worldwide exports and imports divided by the sum of worldwide exports and imports of all countries including in the index. Once again assuming that n country is used to construct the index, the weight for country i is:

$$W_i = \frac{WX_i + WM_i}{\sum_{i=1}^n (WX_i + WM_i)}$$

- W_i = The weight for each country i
 WX_i = The Worldwide export of country i
 Wmi = The Worldwide import of country i
 n = Number of countries that used to construct index

The multilateral weighting approach attempts to capture the competition between 2 countries in countries outside of their domestic markets but it gives too much weight to nations that trade more extensively with each other than with Thailand.

(3) Double Weighted Method

Recognizes the competitive position of domestic producers of import substitutes and therefore requires information on production for local consumption as well as on trade flow. It attempts to combine the advantages of both bilateral and multilateral weighting schemes.

$$TH-INDEX = \sum_{i=1}^n (SI_i / THB)^w$$

TH-Index = Proportion of total Thai's export to other countries

SI_i = The currency index of country i that import goods to other countries

THB = Thai currency

n = Number of countries that used to construct index

(5) The base period for calculating the weighted

In most cases, the Real Effective Exchange Rate calculations described above are converted into indices by taking a certain year as the base year. However, the characteristics of the base year become the main issue in the disputes as how to interpret the developments in the real exchange rates. In fact, the real exchange rate movements based on different years can be interpreted quite differently. The main criterion for the base year is that both the internal and external equilibrium should be met simultaneously in that specific year.

(6) Price Index

In order to calculate the Real Effective Exchange Rate Index, it needs to adjust the index in term of nominal tem (NEER). Effective exchange rate indexes are most often constructed to measure changes in a country's international competitiveness. The price index according to theory, it should be export price index. However export price index has limitation in "Sampling Bias" which are the commodities in the basket cover only traded good not cover the exportable goods.

Other index that can cover more goods for example Wholesale Price index, GDP Deflator, Unit Labor cost which is used for the industry. But in normal practice these index have a lot of limitation especially frequency of the information and delay of information. In practice, we may use Consumer Price Index which is widely used, easily, reliable and faster in gathering the information. Normally in predicting the future inflation, it may be based with changing in Consumer Price Index.

2.7 Evolution of Exchange Rate in Thailand

In this chapter, I will describe the type of exchange rate arrangement in the world and also the evolution of exchange rate system in Thailand.

Exchange rate arrangement:

(1) Par value system:

The value of currency under a fixed exchange rate regime (Bretton Woods agreement).

Bretton Woods Agreement

An arrangement which was signed in Bretton Woods New Hampshire, USA in 1944 created the International Monetary Funds (IMF). Its set rules for exchange rate behavior and created a pool of common currencies thereby, making the IMF world 's lender of last resort. The agreement achieved was a compromise between Keynes's proposals for an International Clearing Union and Harry White's plan for an International Stabilization Fund. Par value of exchange Rate was fixed in terms of gold. A country has to intervene if its exchange rates were 1 % above or below the Par but revaluation or devaluation was permitted without IMF authorization. An adjustment of more than 10% was permitted if the IMF thought there was a fundamental disequilibrium (a condition vaguely defined). Temporary borrowing from the IMF was impossible to support a currency. The gold exchange standard of Bretton Woods was abandoned on 15 August 1971.

Critics of Bretton Woods noted that the agreement did not provide a mechanism for changing inappropriate national exchange rate policies, failed to make national monetary and exchange rate policies compatible and

discouraged frequent changes in the exchange rate parities. However, this international monetary regime was in force from 1944 to 1971. Its demise was hastened by the problems created in the US economy by the Vietnam War. In practice, it was a dollar standard as most countries were against the US dollar.

(2) Daily Fixing currency to single currency

A domestic currency is pegged to a major currency with infrequent adjustment of the party.

(3) Pegged currency basket:

A combination of currencies to produce a common unit e.g. The ECU. The value of these currencies are weight e.g. by sharing in the World trade or the gross national products of the countries participating in the fixed exchange rate. An exchange rate's value is tied to a goal or a major currency or basket of currencies.

The gold standard was not used after the Second World War. It was being replaced by a dollar standard, under Bretton Woods agreement until 1971. Later in Europe, a fixed exchange rate regime tied several currencies to other European currencies under the exchange rate mechanism of the European monetary system. Currencies with a fixed party are permitted to vary only within a narrow range above and below par value, Fixed exchange rate promotes stability in the international trade but carries the cost of holding greater reserves of foreign currencies and other reserve asset. A revaluation or devaluation of fixed exchange rate creates considerable problems of adjustment in the nation economy concerned.

(4) Managed Float system

It determined exchange rate which can change continuously as it is not pegged to another currency or to gold by a central bank. Indicator for adjusting the rate includes the balance of payments position, international reserves; some countries adopt the managed float base on certain currency composite.

In Practice, speculation or central bank, intervention, the latter being “A Dirty Float”, can stabilize an exchange rate

Although lower reserves of gold and hard currencies are needed under a floating exchange rate regime, Thai regime has disadvantage including a greater amount of uncertainty against exporters.

(5) Independent Float

Rates are market-determined, with any intervention aimed at moderating rate of change, rather than at setting a level of rule.

There are 5 phases of exchange rate arrangement as follows:

Phase 1: The Ancient Money

In order to better understand what money is and what role it plays in our lives, we should begin by defining what we mean by the word 'money'. Simply put, money is nothing more than what is offered or received for the purchase or sale of goods and services. The earliest money came in many forms--cattle, salt, grain, tobacco, whiskey and stones, to name a few. In Southeast Asia, the use of cowry shells (*bia*) dates back to pre-history. Traders realised that it was easier to assess the quality and weight of metals than other commodities

The history of ancient money is fascinating and Thailand can be a coin collector's dream or nightmare, depending on how you look at it. Thai pig-mouth money, bracelet money and bullet coins are unique in world coinage, but the scarcity of old coins makes research and comparisons difficult for the collector.

Thai coinage, along with that of most of Southeast Asia, traces its origin to the Funan Kingdom, which lasted from the first to the sixth century, whose people were Buddhist with a strong Brahmin influence. The **Kingdom of Funan** was established as a Hindu (Indian) kingdom in the Mekong delta area to foster trade between Hindu and parts of Asia, particularly China. It was at **Oc-Eo**, the port city of **Funan**, that coinage first appeared in Southeast Asia during the first few centuries of the Christian era. This coinage was based on the Hindu models of silver coins, and throughout the region's history, most coins have been local variations of this early Indian silver coinage.

The importance of **Hindu India's role** in the coinage of Southeast Asia is closely related to the reason Hindu ventured into the region to begin with. In the first century **A.D.**, **Rome**, **Hindu's (India's)** supplier of gold and silver, suddenly cut off all exports of these metals because of trade deficits and the undermining of their own economy at

home. Hindu, in great need of new sources of both metals, turned to Southeast Asia and began to build trade and exploration settlements that later evolved into kingdoms such as Funan. At the time of the Roman decision to stop exports of precious metals, India already had a long history of silver coinage. When the Hindu explorers found silver in Southeast Asia, this supplanted the earlier Roman supplies and the Hindu and Buddhist kingdoms that arose followed India's lead and began their own silver coinage own silver coinage. The coinage of the **Funan** era was silver, molded and hammered in a method very similar to that of sixteenth-century England. One side of a Funan coin shows the sun; the reverse side shows Vishnu's hair, a drum, the sun and the moon. These coins, apparently divided to make small change, are sometimes found cut in pieces. They were widely distributed from present-day Burma to Vietnam.

By the sixth century, the Funan Kingdom was in decline and was succeeded in Thailand by the **Dvaravat Kingdom** which prospered from the sixth to the eleventh century, when it declined after an Angkorat Khmer invasion. The coinage from this period was also hammered, with more designs including conch shells, goats, rabbits, lotus blossoms and water jars.

The Srivijaya Kingdom spread north from Sumatra through the Malay Peninsula to southern Thailand, existing from the eighth to the thirteenth century. Its coinage includes gold and silver coins with a sandalwood flower mark and a **namo** (prayer) mark. These three ancient kingdoms all contributed to coinage produced in Thailand.

The Kingdom of Laan Chang (Laos and northeast Thailand) used silver tiger-tongue money sometimes called "**leech money**" because it resembles a leech found in Thailand. However, the foreigners preferred to use the term of "**bar money**." Brass versions were changed for the silver version. Governors in southern provinces issued tin-based coins, similar to Chinese coins, with Chinese, Arabic and Thai inscriptions.

The northern **Lanna Kingdom**, which lasted from 1239 to 1564, used **leaf (or line) money** made of brass and silver bubbles, which is called "**pig-mouth**" money . Nobody has been able to duplicate the technique of making pig-mouth money, and because the silver is very thin and breakable, good pieces are now very rare. **Flower money**, which is flat, round and small, is of better quality silver than other coins from this period. One side is decorated with flower like patterns, and the reverse face is dented or pitted. **Bracelet money** was also used in the Lanna Kingdom. Called this because of their shape, bracelet coins are actually too small to fit around a wrist, although some experts believe that this type of coinage originated in a larger size that was worn by mountain people around the wrist for easy transport. King Ramkhamhaeng (1279-1298) of **Sukhothai** is credited with introducing bullet coins. Some experts think they were developed to resemble cowry shells, which had been used as money from ancient times. Others believe they were only a more convenient form of bracelet money. A **bullet coin** is shaped something like a signet ring. It was made from a short bar of silver, widest at the middle, with its ends bent around to form a complete circle. It was then stamped with various circular decorations which could indicate certain reigns or places of manufacture. The coins were solid silver, but since their weight varied, their value had to be assessed by weighing before a transaction could take place. During the **Kingdom of Ayudthaya** (1569-1767) many high-quality bullet coins were produced, but because of the destruction of Ayudthaya's records during the Burmese sacking in 1767, it is difficult to attribute the marks on the bullet coins to the correct reign. Ayudthaya coins are well made and, aside from their markings, can be distinguished by their shape. Ayudthaya bullets have one hammer mark.

After the Ayudthaya era, **King Taksin (1767-1782)** resigned over a traditional kingdom at **Thonburi** (opposite to the present day Bangkok). The most distinguishing

feature of **Rattanakosin** (Bangkok) era coins is the mark of the **chakra** , the Buddhist Wheel of Law and symbol of the Chakri Dynasty. Ninety-five percent of Bangkok coins have the chakra as a dynastic mark, plus another personal mark. The stamping of the marks was done with the newly made bullet coin held in a mold in an elephant bone. Elephant bone was used because wood was too soft and would split, and iron was too hard and would flatten the coin.

The old Thai monetary units were complicated. The largest denomination was a **chung**, that was used only for accounting purposes. Twenty **tamlueng** equaled one **chung**, four **baht** equaled one **tamlueng**, four **salueng** equaled one **baht** and two **feungs** equaled one **salueng** with further breakdowns into **seeg ziew or pai utt** and **solot** This system prevailed until 1897, when it was replaced with the current system of Baht and **satang** (one hundred satang equals one Baht).

Cowry shells from the **Mekong River** had been used as currency for small amounts since the **Sukhothai period**. **Rama III (1824-1851)** was the first king to consider the use of a flat coin. He did so not for the convenience of traders, but because he was disturbed that the creatures living in the cowry shells were killed. When he learned of the use of flat copper coins in Singapore in 1835, he contacted a Scottish trader, who had two types of experimental coins struck in England. However, the king rejected both designs. The name of the country put on these first coins was **Muang Thai**, not Siam.

Flat coins were finally introduced for use in the Kingdom during the reign of **King Mongkut, Rama IV (1851-1868)**, although bullet coins were still produced during the early years of his reign. The manufacture of bullet coins was slow; only 240 coins in a day could be produced by a single group of craftsmen. But commerce and trade were on the increase, creating a great need for more coins. A lot of poorly stamped

and hammered bullet money was made during this time because the artisans were under constant pressure to speed up their work. Two experimental series of flat coins were issued, but the production of these coins by hand was even slower. Large numbers of foreign coins were coming into the Kingdom at this time, and the normal practice was to melt them down and manufacture bullet coins. This procedure was time-consuming, so **King Rama IV** issued a decree legalizing the use of foreign coins.

Mexican coins were especially popular for international use because Mexico was the biggest silver producer in the world, and large numbers of coins were exported, especially to China. Many merchants in Thailand were reluctant to accept the foreign silver coins, even after the **Royal** decree in November 1857 that made the foreign coins legal tender. Because of this lack of acceptance, the king issued another decree, this time ordering the counter-stamping of the chakra and the crown on the Mexican coins. These markings clearly made them Thai coins. They soon became so popular and desired as jewelry that another decree was issued to prohibit the use of foreign coins as children's ornaments.

Also in 1857, England's Queen Victoria became aware of the coin shortage in Thailand and sent **King Rama IV** a coining machine as a gift. This was used to produce the first machine-made Thai coins. The first series of coins in gold and silver have the chakra and elephant on one side and the crown on the other. Stars are used to show the denominations. Because the machine was a gift, these are known as **banagarn** (royal gift) coins. The machine was hand operated, so only a small total of coins was actually issued. The king was impressed by the minting technology, so he ordered a new minting machine from England, which cost three thousand pounds, and included an engineer's services as part of the purchase agreement. The machine arrived in Bangkok in 1858, but the engineer unfortunately died on arrival. Two replacement engineers were sent;

one drowned, but the other set the minting machine up before he also died. Fortunately he had time to train a Thai engineer who was able to carry on.

King Rama V continued the manufacture of flat coins and an occasional commemorative issue of bullet coins. In 1876 **King Rama V** introduced the first Thai coin with a king's portrait. This required special assurances to the people that they could handle the coins and put them in cash boxes without being guilty of lese majesty. To make sure policemen were not overzealous, the king proclaimed that any policeman arresting a person for this offense would himself be punished. Bullet coins continued in use for many years, and were finally withdrawn from circulation in October 1904.

Money Through Revolution and War

It has been argued that the American, French, Russian and Chinese revolutions were fought on the back of paper money printed by their respective governments. The economic base and political will simply not exist to raise the necessary funds from taxation. Moreover, no banker in their right mind would lend such enormous amounts when there was little or no intention to repay. In fact, the inflation which resulted from increases in government-issued money was far less damaging for the domestic political agenda than enormous interest payments to foreign creditors would have been. However, there is one very powerful group whose interests are negatively affected by such inflation--banks.

By the beginning of the nineteenth century, the world's leaders had devised a system which, they believed, would stabilize currencies. Known as the 'gold standard', it meant that each country's currency could be exchanged into gold, and then from gold into another currency at a fixed exchange rate. (Siam first passed the Gold Standard Act in 1908). This system facilitated international trade, but, more importantly for bankers, it assured that their loans would not be repaid in money of inferior purchasing power.

The experiment with the gold standard ended abruptly with the outbreak of World War One. Gold flowed out of Europe and into the United States for the purchase of American goods, eventually forcing European countries to suspend gold payments for fear that their gold reserves would be completely exhausted. US gold reserves rose from \$203 million in 1914 to \$2.9 billion in 1917. This fact, and the effects of the war, started two economic processes in motion:

On the one hand, the outflow of gold was symbolic of a more general lack of confidence in European economies. As governments printed more and more notes to try to repair the damage of five years of war, runaway inflation gripped many parts of Europe. In Germany, by the end of 1923, prices had reached 1 422 900 000 000 times their pre-war levels! A single US dollar could buy room and board for a week. This attracted an international army of bargain hunters; rumors were spread in Germany that they were Jews. The importance of money management is highlighted by the fact that all of the countries of Central Europe which suffered a collapse of their currencies following World War One were eventually to experience fascism, communism or both.

On the other hand, the massive inflow of investment in the US inflated stock prices and real estate values to unheard-of levels, fostering a nearly decade long economic boom. When it finally sank in that earnings expectations were far beyond actual performance, the bubble burst. In 1929, the Great Depression began. The newly created US Federal Reserve system (the American central bank) proved powerless to either slow the initial expansion or counteract the even more rapid contraction. In an expression used at the time, it was suggested that monetary policy, the manipulation of interest rates and the money supply to influence the economy, was like a string. You could pull it with incalculable results. But you couldn't push it at all. That is, you can increase interest rates and shrink the money supply to slow the economy down, but once

the economy has hit rock bottom, the reverse action does little or nothing at all to start the engine back up again--depression era efforts to stimulate the economy using monetary tools failed miserably.

Money politics played a key role in the Siamese People's Committee Revolution of 1932, the event which marked Siam's political transition from an absolute to a constitutional monarchy. During the uncertainty of the depression, investors sought to change their money into gold. This resulted in an outflow of gold from government reserves, eventually forcing the United Kingdom to (once again) abandon its promise to exchange pound notes for gold. Siam, however, did not leave the gold standard, making Siamese exports more expensive relative to those of Britain and its colonies. There was a general feeling that the Siamese government would eventually be forced to devalue the baht. This lead speculators to withdraw baht from banks to buy foreign currency, in the hopes that they would be able to buy back the baht at the devalued rate. (This should sound familiar to contemporary Thai readers!) The Siamese economy continued to deteriorate, eventually forcing the government to abolish several government agencies, lower pay and lay off civil servants. These disgruntled cadres would play pivotal roles in supporting the People's Committee Revolution just a year later.

One beneficial outcome of the various experiences of inflation and depression during this period were the experiments with 'scrip money' in Europe. In the absence of a stable national currency, hundreds of communities printed their own, interest-free, currencies which could only be used within the boundaries of the issuing region. The most successful of such systems was in Worgl, Austria, where local authorities printed 5000 Worgl Shillings which, within a year, had circulated 463 times--14 times as much as the Austrian Shilling. This meant that the same amount of money created 14 times as many jobs. After two years, Worgl achieved full employment alongside impressive

infrastructure development. When news of the success of the local currency scheme got out, over 200 other Austrian communities made plans to establish their own systems. Despite their success, such systems were perceived as a threat to state control over credit creation and were outlawed by the Austrian State Bank.

What the experiments with scrip money clearly illustrated on a micro-economic scale was that re-starting the economic engine after the Great Depression required that money not just be made available, but be spent. After much, painful delay, this idea, in an altered form, finally reached the mainstream. Not surprisingly, officials decided that the government should do the spending. The man who was credited with popularising this idea, which came to be known as 'fiscal policy', was the British economist, John Maynard Keynes. The Second World War is often offered as proof of what Keynes said--with the outbreak of conflict, gold flowed into the US once again and the economy boomed, pulling the rest of the world's economies along with it

Phase 2: Par Value system (1963-1978)

Post World War Two: The Bretton Woods Agreements

At the end of the Second World War, 730 policy makers from 44 countries attended the Bretton Woods conference in a small resort town of the same name in New Hampshire. While Thailand was not an original signatory to the Bretton Woods treaties, she did agree to join the gold standard in January, 1946, and eventually joined the IMF and World Bank in May, 1949. The primary objective of the Bretton Woods agreement was to attempt to reinstate the gold standard--once again--in order to facilitate international trade and protect creditors from any potential currency devaluation.

However, in 1944, the world's supplies of gold were even more unevenly distributed than they had been when the gold standard was abandoned thirty years earlier. The United States held nearly two-thirds of the world's gold supply in its vaults. Many countries which had been buying too much and selling too little were left with no gold reserves at all. The only way to overcome such a deficiency, according to economists, was to make a country a more attractive place for others to buy and make imports less attractive for its own citizens.

Unfortunately, this involved keeping government expenditures low, freezing wage rates and keeping interest rates high--in other words, sacrificing the domestic social agenda to the needs of international trade. In the meantime, the International Monetary Fund (or, 'IMF') would provide the funds needed to keep the trade flowing.

Under the Bretton Woods arrangement, countries agreed to keep the value of their currencies stable in relation to other currencies (called the 'par value system'). If a country was buying more than it was selling and the value of its currency started to fall, the central bank was expected to step in and buy the currency to maintain its value. If the central bank did not have sufficient reserves to maintain the value of the currency, it

could borrow funds from the IMF on a temporary basis. It would then be up to the government to correct the situation which had created the trade imbalance in the first place by raising taxes and interest rates and lowering government expenditure.

In contrast to the role of the IMF as banker to balance of payments troubles, the World Bank (initially called the International Bank for Reconstruction and Development, or 'IBRD') was to provide the funds necessary for the reconstruction and economic growth of post-war Europe. In fact, the World Bank played a relatively minor role in this respect; the great majority of such funds came from the US brokered Marshall plan, a transfer of nearly 13 billion \$US to war-torn European countries in the ten year period following the end of the war. Towards the end of the 1950s, as the economies of Europe recovered, the IMF began to play its role bridging the gap between exports and imports. It was only in the 1970s that the World Bank began moving towards its current focus on rural poverty alleviation through the provision of (small credit schemes). As part of its agreements with the IMF, Thailand was under obligation to move towards the par value system, whereby the value of the baht would be determined in gold (the 'par' value) and the government would agree to maintain the value of the currency within 1% above or below the par value. This was accomplished in stages. At the end of the war, Thailand's reserves, made up mostly of Japanese yen, were greatly depreciated. Foreign currencies were needed for post-war reconstruction, so the government required that holders of dollars and pounds sell them to the Bank of Thailand at an official exchange rate. Not surprisingly, this resulted in the establishment of a black market where exchange rates were nearly double the official rate. The government established a multiple exchange rate system which required exporters of primary commodities such as rice, rubber, tin and teak to sell all foreign currency receipts to the Bank of Thailand at official rates. Furthermore, foreign currency needed

to finance government expenditure and pay for the consumption of essential goods was to be supplied through the official market. This allowed the government to rebuild its foreign currency reserves while subsidizing the price of basic necessities for urban consumers--at the expense of rural producers. All other trades could change hands at market rates.

By 1955, foreign reserves had adequately recovered to allow a return to a free market exchange rate system. The Exchange Equalisation Fund (EEF) was established to act as a buyer and seller of foreign exchange for short-term stabilization purposes. The EEF performed its task quite effectively, eventually stabilizing the value of the Baht relative to the world's major currencies, but with a little more flexibility. On 7 August 1978, the EEF adjusted the buying and selling rate of US dollar by 1 per cent from B 20.375 and B 20.425 to B 20.175 and 20.225 per US dollar respectively. The objective was to prevent the Baht value from falling excessively as a result of depreciation of the US. Dollar, which possible adverse effects on prices of imported goods and the domestic cost of living. It should be recognized that this system was adopted for every short period. According to Wibulsawasdi (1992), the value of Baht-dollar rate changes every day where as the foreign exchange market needed more confidence in the Baht-dollar rate. Therefore, the authority adopted 100% weight US. Dollar in practices. Preparations were made for Thailand's entry to the par value system in 1963, when the baht value was fixed at 0.0427245 grams of gold or 20.8 baht per US dollar. This par value was successfully maintained until mid 1972.

Phase 3: The Daily Fixing system (1978-1984)

The problem, of external and internal instabilities occurred in 1978 - Thailand confronted with high deficits in balance of trade and balance of payment s, accompanying with high cost of living. Two main characteristics of the government policy were to subsidize some exporters in agricultural sectors, which had problem s, and to slow down an expansion of domestic demand. An important policy to solve the problem of external instability was that the government declared to change our exchange rate system from the par value system to be basket of currencies pegged system. In August 1978, the value of Baht appreciated for 20 Satang. In order to reflect more closely the market supply and demand for foreign currencies and at the same time contribute to the development of the local foreign exchange market. The Daily Fixing system was adopted on November 1st, 1978. Under this system, the US.dollar was determined in the daily fixing session by the representatives from EEF and commercial bank. Demand for the supply of the US Dollar at various exchange were observed. The EEF would intervene by buying and selling at a certain rate, i.e., and a fixing rate. Basically, the daily fixing rate was determined partly by the demand for and supply of foreign currencies in the foreign exchange market and partly by the EEF in an endeavored to maintain and orderly market condition, The U.S. Dollar fixing rate was used as the base rate at which transactions between commercial banks and customers were conducted. Buying and selling rate applicable to customers ' transactions in other six currencies were determined on the basis of the cross rate between fixing rate for US Dollar and the exchange rate of the currency concerned in the international markets.

After Thai adopted the new policy, the interest rate was raised twice in order to slow down the domestic demand from 9% to in 10.5% per year in February 1978 and from 10.5% to 12.5% per year in December 1978. Additionally the BOT conducted the

financial program to control domestic credits, while the fiscal policy is also restrictive by increasing some taxes. As a result of contractionary policies, the real exchange rate in 1978 was depreciated. The second oil shock in 1979 affect the Thai economy severely due to a weak economic Structure of Thailand. In addition, there were some chronic economic problems such as lack of liquidity in the monetary system, saving shortage, capital flight and inflation. First three problems based on an inflexible interest rate structure. Furthermore, the serious inflation problem reduced the real interest rate and hence a reduction in saving, The BOT managed these problems by (1) forming the repurchase market on April 9th, 1979 to add liquidity among commercial banks and financial institutions. (2) adjusting the structure of domestic interest rate by increasing the interest rate ceilings of time and saving deposit and give up the ceiling of interest rate of deposit form foreign countries m finance company and IFCT at the commercial banks. For the fiscal policy in this year, the government remitted personal income tax and corporate tax including the increase of minimum wage by 10 Baht. However, the oil tax was raised and changes from the specific tax to as valorem tax for reducing in demand for oil. There was exception for interest rate tax of foreign borrowing to induce capital inflows and to increase liquidity into the monetary system. In this year, the relative domestic price of tradable to nontradables was high due to the oil shock. Domestic inflation rate of tradable was as high as 23.91% while inflation rate of nontradables was 15.59% in 1979. Therefore, the real exchange rate depreciated in this year. Noticeable, the year with the oil shock, 1973 and 1979, the real exchange rate depreciated pr the domestic prices of tradable were more expensive than the domestic price of nontradables relatively.

The problem of economic instability was still important especially for high cost of living.

Since 1981, the problem of inflation was loosened up. So the value of the Baht continued to decline against US dollar. This was due to the strong appreciation of the US dollar compared to other major currencies following a restrictive monetary system intended to arrest the inflationary trend while the fiscal policy reduces some expenditure and rose some taxes to increase government revenue. In order to keep the value of the Baht stable against other currencies, the Baht was devalued by 1.07 percent (21 Bahts to 20.775) and 8.7 percent (21 Bahts to 23 Bahts per US\$) in term of US dollar on 12 May and 15 July 1971 respectively. The exchange rate adjustment was conceived as a means of boosting export while deterring imports

Fixed to US Dollar (July 1981 – November 1984)

After the war devaluation of Baht, the values of dollar in the international foreign exchange market continued to be high, thus forcing the EEF to release an unusual amount of dollars on to the market. In order to promote the country's financial stability and exports as well as relieve the trade and payments problem, the daily fixing exchange system was discontinued on 1 July 1981. Under the new system, the EEF was solely responsible for the determination process and that the EEF offered to buy and sell an unlimited amount of US\$ at the intervention rate, which was fixed at Bht 23 / US Dollar. Some researchers suggest that there are many objectives to be considered when the authority decides to fix Baht to the US Dollar. If the authority fixes the value to the us Dollar, when the value of US dollar depreciates, it will be suitable to relieve the trade deficit. However, if the economy faces the import inflation, the authority should fix the value of the Baht to US dollar.

Phase 4: A Basket –Pegged of currencies (1984 – July 1997)

After the maintaining a fixed exchange rate against the US Dollar for three years, the continuous appreciation of the US dollar abroad caused the Thai authorizer to further devaluing the Baht by 14.6% from 23 to 27 baths per dollar on November 8, 1984. The exchange rate of the Baht against the United States dollar was announced daily by the Exchange Equalization Fund, which stood ready to buy and sell the US dollar with the commercial banks at determined rates. This system resulted in the Baht becoming one of the most stable currencies in the world and supported Thailand's repaid growth over the year.

The objective of this system: To increase the competitiveness of Thai exports in the world market and more realistically reflect the condition of Thailand's economy. Under this system the Baht was again linked to a basket of the seven currencies mentioned above. The average values of the currencies in the basket would be weighted according to the significance of trade conducted with Thailand. The Baht's parity against these currencies fluctuated according to their performances. For example due to the recent dominant position of Japan in Thailand's external trade, the Japanese yen has been weighted relatively higher apart from the weighted basket index, two other factors: the short term domestic foreign exchange rate supply/ demand situation and the country's long term balance of payments position, were also taken into consideration. The Exchange rate Equalization Fund (EFF) can intervene in the market by determining the value of Baht occasionally when necessary.

Phase 5: Floated exchange rate market (July 1997 – Present)

The Thai economy faced severe difficulties in 1997, mainly as a result of the bubble economy, which made the country highly dependent on short-term foreign capital and overly exposed to unproductive and speculative investment in the asset markets. The economic problems greatly affected market confidence, leading in particular to chronic currency speculation which persisted throughout the half of 1997 and obliged the bank of Thailand to intervene in the foreign exchange market as seemed necessary. While the intervention was successful to some degree in stemming offshore currency speculation, it proved insufficient to regain confidence in the Baht, and foreign capital outflow continues. At the same time, the sharp economic slowdown began to affect the performance of financial institutions. The problem of non-performing loans provokes the loss of both creditors and depositors' confidence in a number of finance companies, sixteen of which were declared temporarily suspended on June 26, to ease narrative panic.

On July 2, the authority abandoned the basket-pegged exchange rate system, replace it with the managed floating exchange rate system. , whereby the value of the Baht will be determined by market forces to reflect economic fundamentals. The bank of Thailand intervenes in the market when necessary. It ignored to prevent excessive volatile and achieve economic policy targets. The floated regime enhances more flexibility and efficiency in monetary policy implementation, increases confidences of domestic and international investors and improves foreign capital flow.

In that period, the Ministry of finance, Thanong Bidaya had announced on July 2 ,1997 “the change of Foreign Exchange System” as follow:

By virtue of the power conferred upon him under Section 8 Paragraph Three of the Currency Act B.E. 2501 as amended. by the Currency Act (No 4, B.E. 2516, The

Finance Minister, upon the recommendation of the Bank of Thailand, hereby issues this notification as follows:

- (1) The Notification of the Ministry of Finance dated 2 November B.E. 2527
Re: Change of Foreign Exchange System is hereby repealed.
- (2) The foreign exchange system shall be such that the value of the Baht is set by conditions in the foreign exchange market.
- (3) The Bank of Thailand shall engage in buying and selling of foreign currency for the purpose of maintaining the stability of the Baht under the system mentioned in 2.
- (4) The Bank of Thailand shall from time to time as deemed necessary, publish the exchange rates between the Baht and foreign currencies for use as a reference rate in conversion of foreign currencies into Baht.

Reform of the Bank of Thailand Act

After since the BOT adopted the floating exchange rate regime on 2nd July 1997, there had been, however, no changes made to the relevant financial regulations governing monetary policy operations. All regulations were still as if the former fixed exchange rate regime were still in operation. Consequently, the Bank of Thailand Act was thus now being appropriately amended. Important issues in the proposed reforms are:

- (1) Objectives and the scope of operations of the BOT

The objectives are to maintain stable price stability and to maintain the health and stability of financial institutions. The suitable scope of operations of the BOT is also specified. This mainly includes the tasks that the BOT has already done such as supervising and monitoring financial institutions, note printing, monetary policy, exchange rate policy, and

foreign exchange control and it also acts as banker to the government and to all domestic financial institutions. However, the BOT will reduce its role in lending to important economic sectors. Furthermore, it will not lend directly to the government, the only exception being an emergency situation of a caused by a highly unstable economy, in order to alleviate the difficulties in achieving the inflation targets.

(1) Monetary Policy Board formation:

The board will determine the monetary policy. The board will include five senior executives from the BOT and a panel of four panel experts from outside the BOT. Each member can hold the position for three years. The terms of membership will be for three years, cannot be served consecutively more than twice but can be extended to a second consecutive term. The board will take monetary policy decisions without intervention from the government.

(2) Relationship between the BOT and the government

The BOT will support policies of the government by giving advice and recommendations, including providing information to the government, without anywhere they do not conflict with the BOT's stated objectives. main operation of its own. The cabinet has the role in recommending of appointing and withdrawing dismissing the governor and deputy governor of the BOT, the BOT Board, and the Monetary Policy Board. However, the cabinet members cannot bring forth the cite monetary policy conflicts as reasons for withdrawn dismissal. In addition, the finance minister will continue to perform the role of supervising and monitoring the BOT's

general operations except for the matter in issues that come under the responsibility of the Monetary Policy Board.

(4) Limited terms of the governor and the deputy governor of the BOT

The governor and the deputy governors shall hold office for a term of five years. And, the term may be repainted, but shall not hold office for more than two consecutive terms. Presently, the Bank of Thailand Act does not specify the terms of office of the governor and or the deputy governor. Specifying with limited serving term, it can limit the terms for these positions which will help to reinforce BOT's independence in its monetary policy operations. Nevertheless, the cabinet still has to approve the designated inflation target level, the type of inflation target being used, and the time frame duration to achieve the specified target.

(5) Measures to increase the operational transparency and responsibility of the BOT

- (a) Mandated the release of the minutes of the Monetary Policy Board in the meetings in the Royal Gazette.
- (b) Regularly reports on the status of foreign reserves will be made to the finance minister for the presentation to the cabinet. When there is a problem with the status of foreign reserves, the BOT will be required to work together with the Finance Minister by giving recommendations and advice. Once and, when the the problem is alleviated, the BOT will be required to recommend measures to reduce the future possibilities likelihood of a recurrent recurring foreign reserve problems.

- (c) Regularly report on monetary policy, the process of implementation, and performance to the parliamentary committees board assigned by the parliament and to the cabinet.
- (d) Set up establishment of an internal auditing supervisory and monitoring committee for investigating, scrutinizing internal affairs of the BOT.

The committee reports directly to the BOT Board.

Under the new system, movements in the exchange rate are expected to be quite large at the initial stage. However, relative stability should be attained after a brief adjustment period. Thailand received financial assistance from IMF. During IMF program, monetary targeting regime was adopted.

Under this regime, the bank targeted domestic supply, using the financial programming approach in order to ensure macroeconomic consistency as well as to reach the ultimate objective of sustainable growth and price stability. The bank set the daily and quarterly monetary base targets on which its daily liquidity management was based. Daily liquidity management was essentially aimed to ensure against excessive volatility in interest and liquidity in the financial system. The Bank of Thailand will intervene in foreign exchange markets from time to time to achieve policy objectives and guard against excessive fluctuations. To support the new foreign exchange regime, a cautious monetary policy stance will continue to be followed. Effective today, the Bank of Thailand has raised the bank rate from 10.5 percent to 12.5 percent. In due course, the Bank will allow market forces to adjust interest rates downward in the context of a stable or strengthening Baht. In the longer run, the managed float system will enable the authorities to implement monetary policy consistent with domestic policy objectives and support healthy capital inflows. Some slowdown in economic activity must be accepted in wake of the new exchange rate regime. However, this will

lay the groundwork for growth with stability in the years ahead. In the short run, so as to alleviate any negative effect on debt servicing and prices that may result from an adjustment in the Baht value, the authorities are prepared to consider supplementary measures, particularly those related to prices of goods considered as necessities, tax deduction for businesses suffering exchange losses, and financing facilities for priority economic sectors.

On 4 October 1999, The bank of Thailand clarified that the term “per counter party” refer to all transactions taken by the head office, branches, representative offices and all affiliated companies of a particular non-resident to be count as one. Non-residents who do not have any underlying trade or investment activities in Thailand are allowed to obtain Thai Baht credit facilities from their on-shore counter parties up to a combined outstanding amount of 50 million Bahts. The Ministry of Finance and the Bank of Thailand believe that the managed float system will benefit Thailand's overall economic development. The new system will provide sufficient flexibility to accommodate developments in Thailand's economy and respond to the situation in financial and foreign exchange markets.

III. RESEARCH METHODOGY

3.1 Overview

In this chapter, I will analyze in quantitative measurement by gathering data from 1994 until June 2001. I will explain the way in finding the Nominal Effective Exchange Rate (NEER), Relative Consumer Price Index (RCPI) and Real Effective Exchange Rate (REER) and also the result of equilibrium exchange rate of Thai currency.

The method in construction NEER, RCPI and REER

In Real Effective Exchange rate index computation, bilateral Nominal exchange rate adjusted for relative consumer price index is weighted by the importance of partner countries. The first part demonstrates the way to calculate the Nominal Effective Exchange Rate Index for Baht and then will adjust index by using the Composite competitor Index between countries in order to get the Real Effective Exchange Rate Index for Thai Baht.

As in the last chapter, it has demonstrated how to construct the index and way to choose it. In order to find NEER, RCPI and REER, it needs to choose the appropriate alternative decision as follows:

- (1) Which formula is used to calculate the average?

This project uses Arithmetic mean which computes a simple average

- (2) Which foreign currencies is used?

Mostly the currencies should cover 9 - 20 currencies and the total trade value should not be lower than 70% of total trade of the country.

In this case, I will choose by considering those countries involved in the majority of Thai trade which are USA, Japan, Singapore, England, Netherlands, Germany, Hong Kong, China and Malaysia because foreign trade among these countries are in the firstly of 9 rank's foreign trade and

total foreign trade value is 70 % of all trade balance between Thai and other countries.

- (3) Which Measure of Economic Activity is used as the basis of weighing the importance of individual currencies?

It uses total trade (export and import)

- (4) The base period for calculating the weighted

The index may use fixed weights, weighted that are updated periodically or weights that are updated annually. I will consider 2 periods.

First period

I will use the year 1995 as the base for calculating the index for Thai Baht. In that period our Thai currency was stabilized and also used the basket of currency

Second Period

I will use quarter 4 of year 1999 as the base because the Thai currency was much more stable after the turmoil of managed float system.

- (5) Price index

In this case we can use aggregate price deflator for example wholesale Price Index, GDP Deflator, Unit Labor cost which is used for the industry. But in normal practice, these index have a lot of limitation especially frequency of the information and delay of information. So in this case, I will use the consumer price index which is widely used, it is easy, reliable and quick to gather the information. Normally in predicting the future inflation, it may base with changing in Consumer Price Index.

(6) How to calculate the weights for individual currencies?

Another issue in weighing the importance of a specific currency involves the selection of weight scheme. If Effective Exchange Rate Index is to reflect changes in a country 's international competitiveness, then ideally the weights should be chosen to reflect the responsiveness of the country 's trade flows to change in exchange rates.

In this report, I use Bilateral Weighted Method. Weighed value of trade has formed the foreign trade of Thailand from year 1994 – June 2001 and I will divide into 3 categories

- (a) Import weight
- (b) Export Weight
- (c) Total Trade Weight

Most data come from the foreign trade between Thailand and other countries in order to construct the most appropriate weight scheme in analyzing the trade weight in each year.

In order to construct the Nominal Effective Exchange Rate (NEER), the most important factors are how to measure the change in exchange rate between Thailand and other currencies (In other foreign currency / Baht or Baht / foreign currencies). Differentiate alternatives will get the different result. By principle, these 2 alternative are supported as follows:

(1) Import

If we consider the impact of exchange rate 's movement, it will affect import of quantity of goods and price. In this case, the measurement in Baht per 1 unit of foreign currency is appropriate because it demonstrates the changes in import price when exchange rate changes. In order to import

goods, the importer needs to convert Thai currency into other currency before settlement. So the exchange rate used is the selling rate (Baht/currency).

(2) Export

When we consider the impact of exchange rate that affects the export price, it should measure in term of foreign currency against 1 unit of Baht. The reason is that the fluctuation in exchange rate will affect the export price when converted into Baht, affecting the producer and exporter in changing the quantities of export goods. The World market and demand set most of the price in Thailand's export commodities, mechanical. For the export, it should use buying rate (the foreign currency / 1 unit of Baht).

(3) Total Trade

Using the Mid- exchange rate.

The Formula used in calculating the Nominal Effective Exchange Rate are:

$$EXW = \sum R * W$$

(Table 3.1 , Figure 3.1)

EXW = denoted weighted exchange rate

R = denoted as the exchange rate in different currencies
(Baht / 1 unit of foreign currency)- Table A.1

W = denoted as the weighted used in calculating the nominal effective exchange rate

Export Weight

$$W_E = \frac{X_i}{\sum_{i=1}^n X_i}$$

W_E = denoted as weighted value of export quantities (Table A.7)

X_i = denoted as the exports from Thailand to country I (Table A.2)

n = denoted as the number of countries

$\sum_{i=1}^n X_i$ = denoted as the total of exports from Thailand to all countries

Import weight

$$W_I = \frac{M_i}{\sum_{i=1}^n M_i}$$

W_I = denoted as weighted value of import quantities (Table A.8)

M_i = denoted as the imports of Thailand from country I (Table A.3)

n = denoted as the number of countries

$\sum_{i=1}^n X_i$ = denoted as the total of imports from Thailand to all countries

Trade weight

$$W_T = \frac{X_i + M_i}{\sum_{i=1}^n (X_i + M_i)}$$

W_T = denoted as weighted value of total trade quantities
(Table A.9)

X_i = denoted as the exports from Thailand to country I

M_i = denoted as the imports of Thailand from country I

n = denoted as the number of countries

$\sum_{i=1}^n (X_i + M_i)$ = denoted as the total trade value

Total weighted against export trade

$$EXW_E = \sum_{i=1}^n R_B * W_E$$

EXW_E = Exchange rate weighted against export trade
(Table A.10)

W_E = Export weighted

R_B = Buying rate

n = The number of countries

Total weighted against import trade

$$EXW_I = \sum_{i=1}^n R_I * W_I$$

EXW_I = Exchange rate weighted against import trade
(Table A.11)

R_I = Selling rate

W_I = Import weighted

n = The number of countries

Total weighted against total trade

$$EXW_T = \sum_{i=1}^n R_M * W_T$$

EXW_T = Exchange rate weighted against total trade
(Table A.12)

| | | |
|-------|---|-------------------------|
| R_M | = | Mid- rate |
| W_T | = | Total trade Weighted |
| n | = | The number of countries |



Table 3.1. Total Weighted Exchange Rate.

| WEIGHTED | | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|----------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | EXW (Export) | 14.20 | 13.94 | 13.95 | 14.46 | 15.06 | 17.79 | 23.57 | 26.85 | 23.35 | 24.75 | 21.69 |
| 2 | EXW(Import) | 9.94 | 10.10 | 10.64 | 11.73 | 11.38 | 12.99 | 17.71 | 20.36 | 16.43 | 16.73 | 15.48 |
| 3 | EXW(Total) | 11.96 | 11.86 | 12.16 | 13.07 | 13.17 | 15.44 | 21.03 | 24.13 | 20.46 | 21.61 | 19.20 |

| WEIGHTED | | 1999 | | | | 2000 | | | | 2001 | | | |
|----------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | EXW (Export) | 20.39 | 21.34 | 22.11 | 22.04 | 19.92 | 20.89 | 22.67 | 22.92 | 22.15 | 23.30 | 23.30 | 23.30 |
| 2 | EXW(Import) | 15.87 | 14.38 | 14.21 | 14.41 | 14.26 | 13.73 | 14.72 | 16.53 | 17.52 | 16.52 | 16.52 | 16.52 |
| 3 | EXW(Total) | 18.57 | 18.37 | 18.76 | 18.65 | 17.39 | 17.55 | 19.11 | 20.08 | 19.93 | 20.18 | 20.18 | 20.18 |

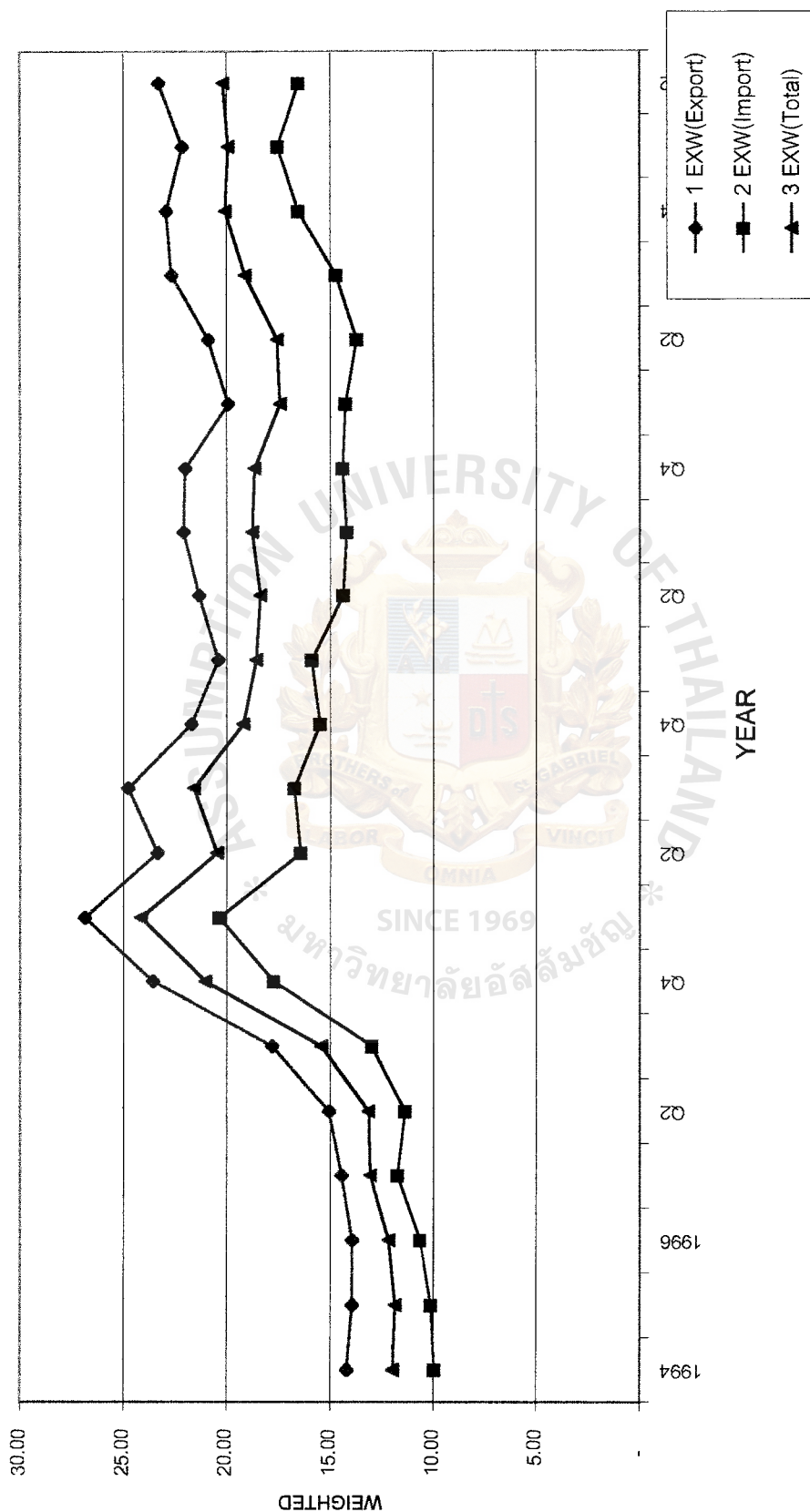


Figure 3.1. Graph for Exchange Rate of Thailand against Different Weighted.

3.2 Nominal Effective Exchange rate

$$\text{NEER} = \frac{1}{\text{EXW}}$$

Tables 3.2 and 3.3 (Figures 3.2 and 3.3)

NEER weighted against export trade(NEER_E)

$$\text{NEER}_E = \frac{1}{\text{EXW}_E}$$

EXW_E = Exchange rate weighted against export trade

NEER weighted against import trade(NEER_I)

$$\text{NEER}_I = \frac{1}{\text{EXW}_I}$$

EXW_I = Exchange rate weighted against import trade

NEER weighted against total trade(NEER_T)

$$\text{NEER}_T = \frac{1}{\text{EXW}_T}$$

EXW_T = Exchange rate weighted against total trade

** NEER index must be compared with base year

There are 3 types of NEER Index, those are NEER (Export), NEER (Import), and NEER (Total import and export). By the way, this index will show the average group of currency per 1 unit of Baht and it should be 100 in Base year.

- (1) If the NEER is higher than 100, it means that Baht is appreciated when compared with the currency's group.
- (2) If the NEER is lower than 100, it means that Baht is depreciated when compared with the currency's group.



Table 3.2. Nominal Effective Exchange Rate (Base 1995).

| TRADE BY COUNTRY | | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|------------------|--------------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| BASE 1995 | | | | | | | | | | | | |
| 1 | NEER(Export) | 98.16 | 100.00 | 99.97 | 96.44 | 92.58 | 78.38 | 59.16 | 51.94 | 59.72 | 56.33 | 64.27 |
| 2 | NEER(Import) | 101.59 | 100.00 | 94.94 | 86.04 | 88.73 | 77.72 | 57.02 | 49.59 | 61.47 | 60.36 | 65.24 |
| 3 | NEER(Total) | 99.14 | 100.00 | 97.53 | 90.75 | 90.03 | 76.83 | 56.40 | 49.14 | 57.97 | 54.89 | 61.78 |

| TRADE BY COUNTRY | | 1999 | | | | 2000 | | | | 2001 | |
|------------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| BASE 1995 | | | | | | | | | | | |
| 1 | NEER(Export) | 68.37 | 65.34 | 63.05 | 63.35 | 69.98 | 66.76 | 61.51 | 60.84 | 62.94 | 59.83 |
| 2 | NEER(Import) | 63.61 | 70.20 | 71.06 | 70.05 | 70.80 | 73.51 | 68.62 | 61.09 | 57.62 | 61.11 |
| 3 | NEER(Total) | 63.86 | 64.57 | 63.20 | 63.58 | 68.19 | 67.58 | 62.05 | 59.07 | 59.52 | 58.75 |

Table 3.3. Nominal Effective Exchange Rate (Base 1999-Quarter 4).

| TRADE BY COUNTRY | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|------------------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|--------|
| | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 NEER(Export) | 154.95 | 157.85 | 157.82 | 152.23 | 146.15 | 123.73 | 93.39 | 81.99 | 94.28 | 88.92 | 101.46 |
| 2 NEER(Import) | 145.03 | 142.76 | 135.53 | 122.83 | 126.68 | 110.96 | 81.40 | 70.80 | 87.75 | 86.16 | 93.13 |
| 3 NEER(Total) | 155.93 | 157.30 | 153.40 | 142.74 | 141.61 | 120.84 | 88.72 | 77.29 | 91.19 | 86.33 | 97.17 |

| TRADE BY COUNTRY | 1999 | | | | 2000 | | | | 2001 | |
|------------------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 NEER(Export) | 107.93 | 103.15 | 99.54 | 100.00 | 110.48 | 105.38 | 97.10 | 96.05 | 99.36 | 94.45 |
| 2 NEER(Import) | 90.81 | 100.21 | 101.44 | 100.00 | 101.08 | 104.95 | 97.96 | 87.21 | 82.26 | 87.23 |
| 3 NEER(Total) | 100.45 | 101.56 | 99.41 | 100.00 | 107.25 | 106.29 | 97.60 | 92.91 | 93.62 | 92.42 |

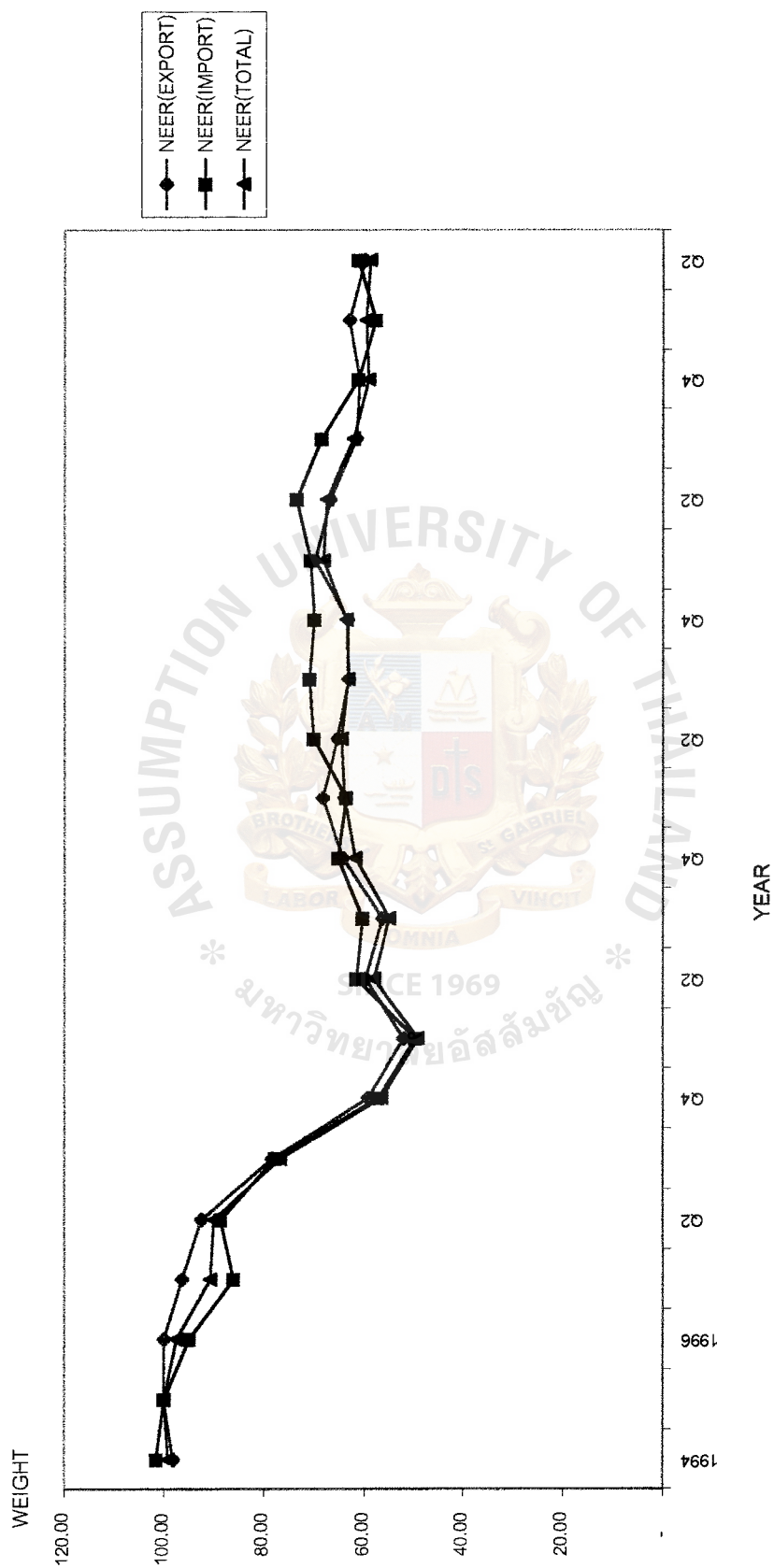


Figure 3.2. Graph for Nominal Effective Exchange Rate (Base 1995).

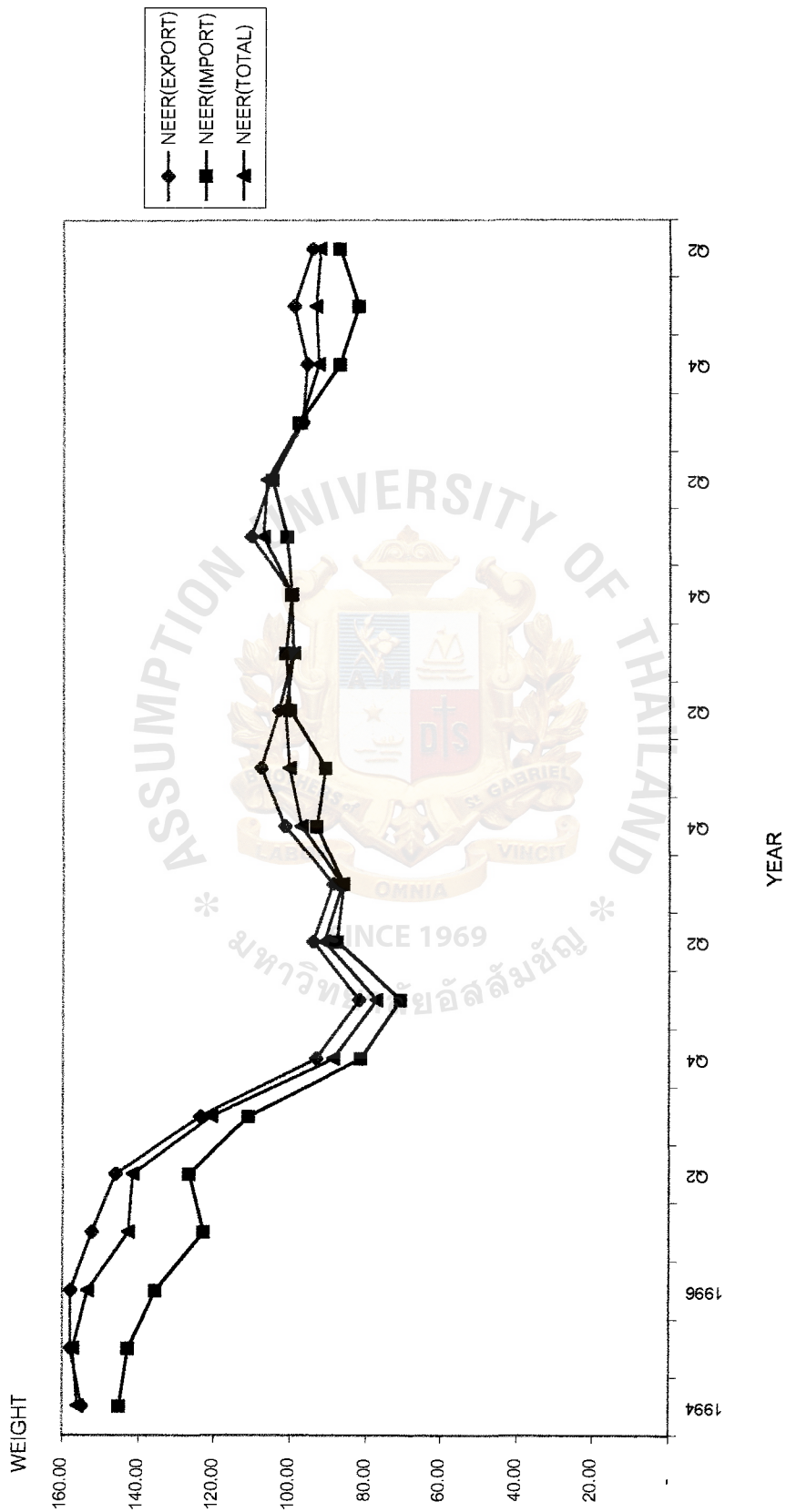


Figure 3.3. Graph for Nominal Effective Exchange Rate (Base 1999 -Quarter 4).

3.3 Relative Price Index

After constructing the Nominal Effective Exchange Rate, the next step is to adjust the Nominal Effective Exchange Rate Index with Consumer Price Index in order to get the Real Effective Exchange Rate or Effective exchange rate adjusted price which is appropriate to measure the equilibrium of exchange rate.

Step in constructing the Relative price between Trading Partners and Thailand or Relative Price Index (RCPI)

$$CPI = \sum_{i=1}^n (W * CPI_i)$$

(Table 3.4 and 3.5 , figure 3.4 and 3.5)

CPI_i = Consumer Price Index for country I(Table A5 and A6)

CPI = Consumer price index against different weighted

W = Weighted

n = Number of countries

Consumer Price Index Weighted against Export Trade

$$CPI_E = \sum_{i=1}^n (W_E * CPI_E)$$

CPI_E = Consumer Price Index in foreign country weighted against export
(Tables A.13 and A.16)

W_E = Export weighted

n = The number of countries

Consumer Price Index Weighted against Import Trade

$$CPI_I = \sum_{i=1}^n (W_I * CPI_I)$$

CPI_I = Consumer Price Index in foreign country weighted against import
(Tables A.14 and A.17)

W_I = Import weighted

n = The number of countries

Consumer Price Index Weighted against Total Trade

$$CPI_T = \sum_{i=1}^n (W_T * CPI_T)$$

CPI_T = Consumer Price Index in foreign country weighted against total trade
(Tables A.15 and A.18)

W_I = Total trade weighted

n = The number of countries

***** CPI must be compared with the base year,**

Table 3.4. Consumer Price Index against Different Weighted (Base 1995).

| BASE 1995 (1: Million Baht) | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|--------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 CPI _E | 97.39 | 100.00 | 102.41 | 104.41 | 105.03 | 105.28 | 105.70 | 106.23 | 106.73 | 106.46 | 106.31 |
| 2 CPI _I | 98.03 | 100.00 | 101.71 | 103.45 | 104.39 | 104.35 | 104.49 | 105.03 | 105.83 | 105.25 | 105.85 |
| 3 CPI _T | 97.72 | 100.00 | 102.03 | 103.91 | 104.70 | 104.83 | 105.16 | 105.71 | 106.35 | 105.97 | 105.87 |
| 4 CPI _{THAI} | 94.54 | 100.00 | 105.86 | 108.63 | 109.74 | 122.91 | 115.75 | 118.44 | 121.05 | 122.08 | 121.53 |

| BASE 1995 (1: Million Baht) | Q1 | Q2 | Q3 | Q4 | 1999 | | | | 2000 | | | | 2001 | |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 CPI _E | 106.91 | 107.36 | 107.47 | 108.34 | 109.13 | 108.62 | 109.24 | 109.49 | 109.74 | 109.74 | 109.49 | 109.49 | 109.74 | 110.50 |
| 2 CPI _I | 106.05 | 106.04 | 106.17 | 107.63 | 107.02 | 106.69 | 106.96 | 107.46 | 108.12 | 108.12 | 108.12 | 108.12 | 108.12 | 108.18 |
| 3 CPI _T | 107.28 | 106.79 | 106.91 | 108.02 | 108.17 | 107.71 | 108.21 | 108.58 | 108.95 | 108.95 | 108.58 | 108.58 | 108.95 | 109.43 |
| 4 CPI _{THAI} | 121.57 | 119.60 | 121.77 | 122.15 | 121.11 | 121.49 | 120.36 | 121.21 | 124.31 | 124.31 | 121.21 | 121.21 | 124.31 | 124.61 |

Table 3.5. Consumer Price Index against different weighted (Base 1999- Quarter 4).

| BASE 1999-Q4 (1: Million Baht) | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|-----------------------------------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|
| | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1CPI _E | 90.63 | 93.47 | 95.52 | 97.24 | 97.67 | 97.83 | 98.11 | 99.40 | 99.00 | 98.64 | 98.60 |
| 2CPI _I | 91.58 | 93.78 | 95.19 | 96.81 | 97.71 | 97.61 | 97.61 | 99.30 | 98.98 | 98.37 | 98.35 |
| 3CPI _T | 91.13 | 93.64 | 95.34 | 97.02 | 97.69 | 97.72 | 97.89 | 99.36 | 98.99 | 98.53 | 98.50 |
| 4CPI _{THAI} | 77.40 | 81.87 | 86.66 | 88.93 | 89.84 | 100.62 | 94.76 | 96.96 | 99.10 | 99.94 | 99.49 |

| BASE 1999-Q4 (1: Million Baht) | 1999 | | | | 2000 | | | | 2001 | |
|-----------------------------------|-------|-------|-------|--------|--------|-------|--------|--------|--------|--------|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1CPI _E | 98.72 | 99.05 | 99.12 | 100.00 | 99.05 | 99.05 | 99.12 | 100.74 | 100.67 | 101.24 |
| 2CPI _I | 98.33 | 98.49 | 98.62 | 100.00 | 99.65 | 99.31 | 99.52 | 100.05 | 100.44 | 100.61 |
| 3CPI _T | 99.25 | 98.81 | 98.90 | 100.00 | 100.24 | 99.79 | 100.15 | 100.62 | 100.85 | 101.31 |
| 4CPI _{THAI} | 99.53 | 97.91 | 99.69 | 100.00 | 99.15 | 99.46 | 98.53 | 99.23 | 101.77 | 102.01 |

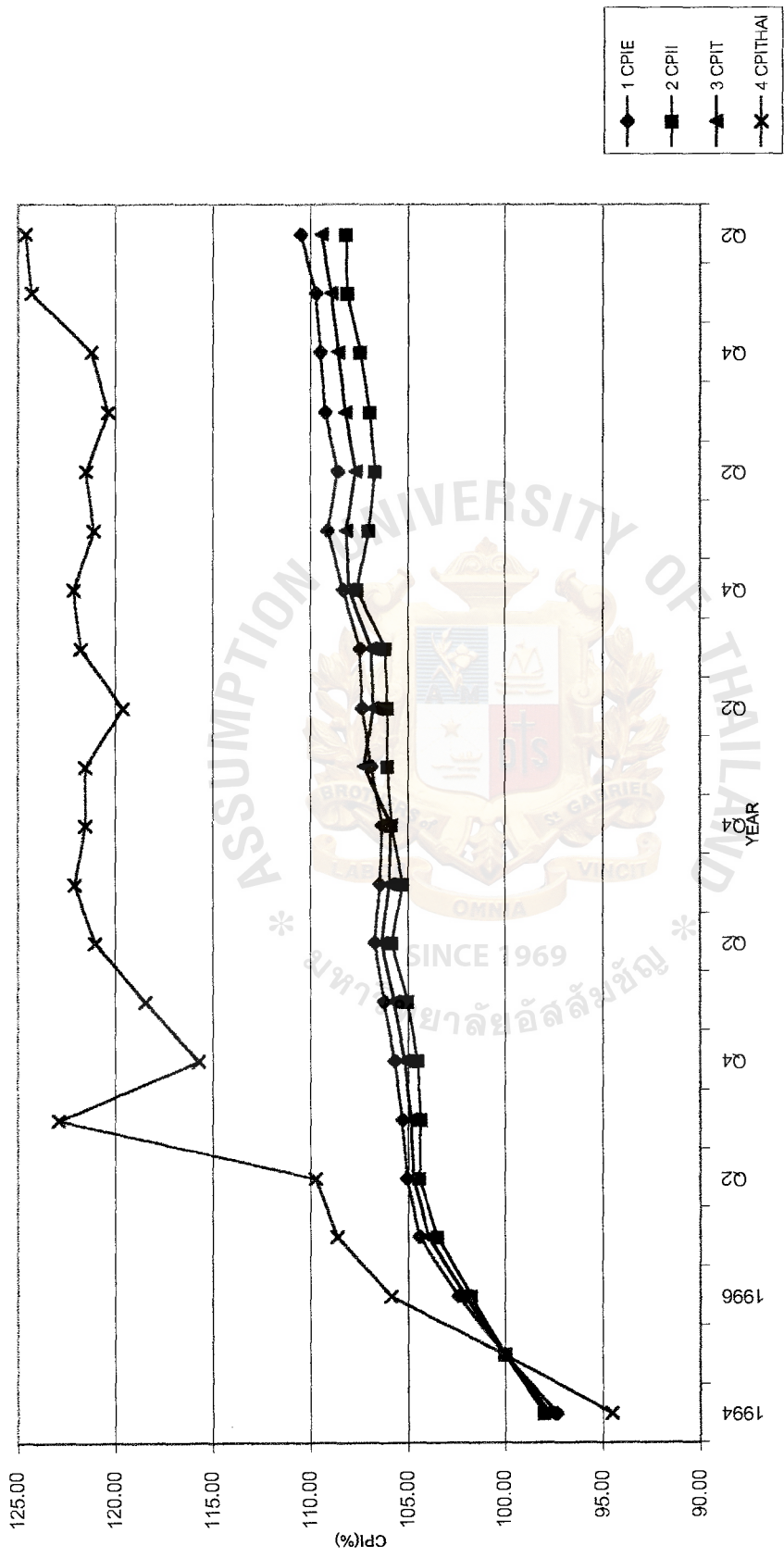


Figure 3.4. Graph for Consumer Price Index (Base 1995).

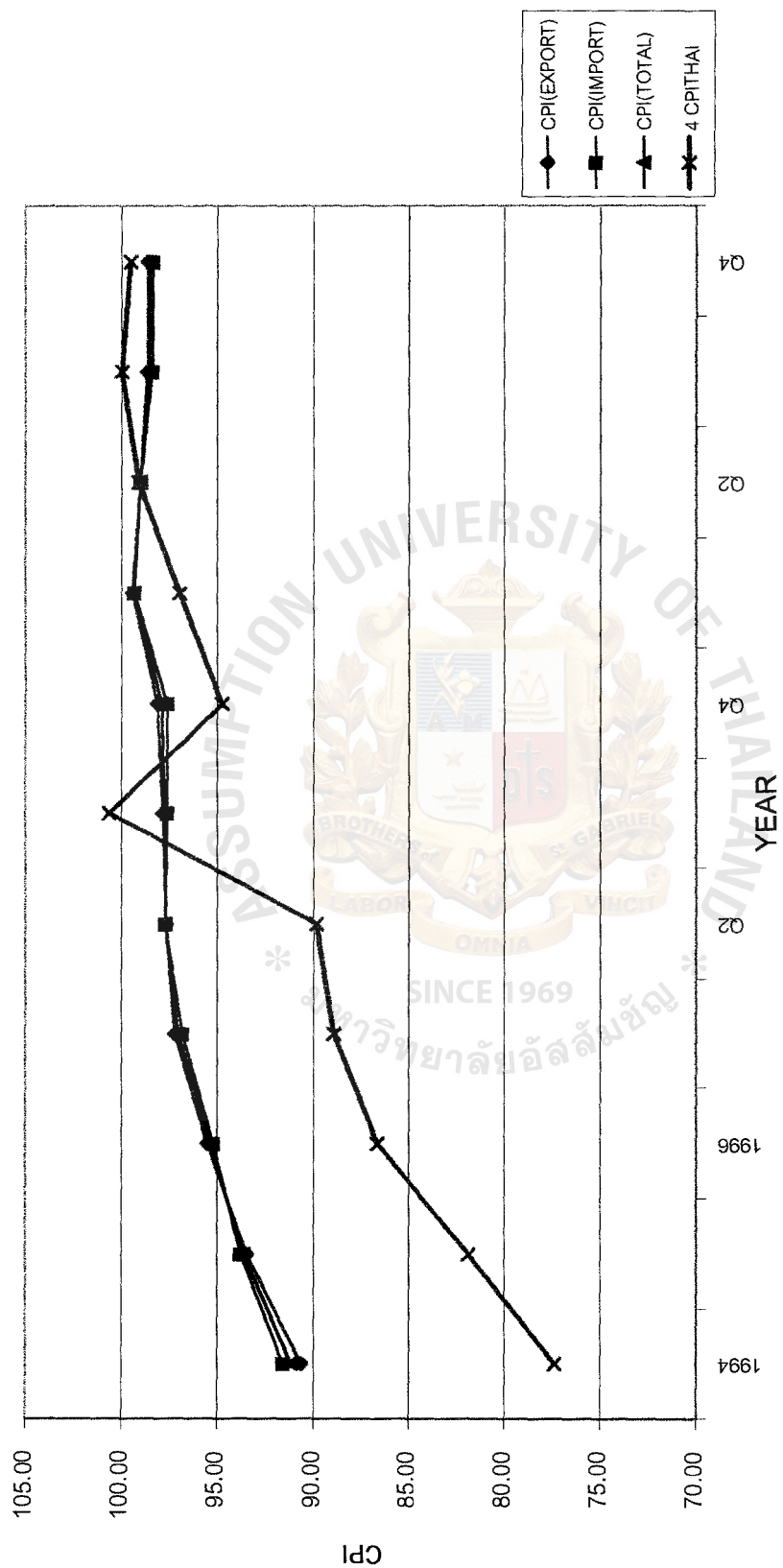


Figure 3.5. Graph for Consumer Price Index (Base 1999- Quarter 4).

Then we will get:

RCPI = Relative price between Trading Partners and Thailand
(Relative Price Index)
(Tables 3.6 and 3.7, Figures 3.6 and 3.7)

Whereas

RCPI_E = CPI weighted against Export Trade
=
$$\frac{\text{CPI}_T}{\text{CPI(Thai)}}$$

RCPI_I = CPI weighted against Import Trade
=
$$\frac{\text{CPI}_I}{\text{CPI(Thai)}}$$

RCPI_T = CPI weighted against Total Trade
=
$$\frac{\text{CPI}_T}{\text{CPI(Thai)}}$$

*** RCPI must be compared with base year.

Table 3.6. Relative Price Index (Base 1995).

| BASE 1995 | | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|-------------------|------------------------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| (1: Million Baht) | | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | RCPI _{E/THAI} | 103.01 | 100.00 | 96.74 | 96.11 | 95.71 | 85.66 | 91.32 | 89.69 | 88.17 | 87.20 | 87.48 |
| 2 | RCPI _{I/THAI} | 103.69 | 100.00 | 96.08 | 95.23 | 95.13 | 84.90 | 90.28 | 88.67 | 87.43 | 86.22 | 87.10 |
| 3 | RCPI _{T/THAI} | 103.37 | 100.00 | 96.38 | 95.66 | 95.41 | 85.29 | 90.85 | 89.25 | 87.85 | 86.81 | 87.11 |

| BASE 1995 | | 1999 | | | | 2000 | | | | 2001 | |
|-------------------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| (1: Million Baht) | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 | RCPI _{E/THAI} | 87.94 | 89.76 | 88.26 | 88.70 | 90.11 | 89.40 | 90.76 | 90.33 | 88.28 | 88.68 |
| 2 | RCPI _{I/THAI} | 87.23 | 88.66 | 87.19 | 88.11 | 88.37 | 87.82 | 88.86 | 88.65 | 86.97 | 86.82 |
| 3 | RCPI _{T/THAI} | 88.25 | 89.29 | 87.80 | 88.43 | 89.32 | 88.66 | 89.90 | 89.58 | 87.64 | 87.82 |

Table 3.7. Relative Price Index (Base 1999-Quarter4).

| BASE 1999-Q4 (1: Million Baht) | | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|-----------------------------------|------------------------|--------|--------|--------|--------|--------|-------|--------|--------|-------|-------|-------|
| | | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | RCPI _{E/THAI} | 117.10 | 114.17 | 110.21 | 109.34 | 108.72 | 97.22 | 103.54 | 102.51 | 99.90 | 98.70 | 99.10 |
| 2 | RCPI _{I/THAI} | 118.33 | 114.55 | 109.84 | 108.86 | 108.76 | 97.01 | 103.01 | 102.42 | 99.88 | 98.43 | 98.85 |
| 3 | RCPI _{T/THAI} | 117.75 | 114.38 | 110.01 | 109.09 | 108.74 | 97.12 | 103.30 | 102.47 | 99.89 | 98.59 | 99.00 |

| BASE 1999-Q4 (1: Million Baht) | | 1999 | | | | 2000 | | | | 2001 | |
|-----------------------------------|------------------------|-------|--------|-------|--------|--------|--------|--------|--------|-------|-------|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 | RCPI _{E/THAI} | 99.19 | 101.16 | 99.43 | 100.00 | 99.90 | 99.59 | 100.59 | 101.52 | 98.92 | 99.24 |
| 2 | RCPI _{I/THAI} | 98.80 | 100.59 | 98.93 | 100.00 | 100.51 | 99.85 | 101.00 | 100.82 | 98.69 | 98.63 |
| 3 | RCPI _{T/THAI} | 99.72 | 100.92 | 99.21 | 100.00 | 101.10 | 100.33 | 101.64 | 101.40 | 99.10 | 99.31 |

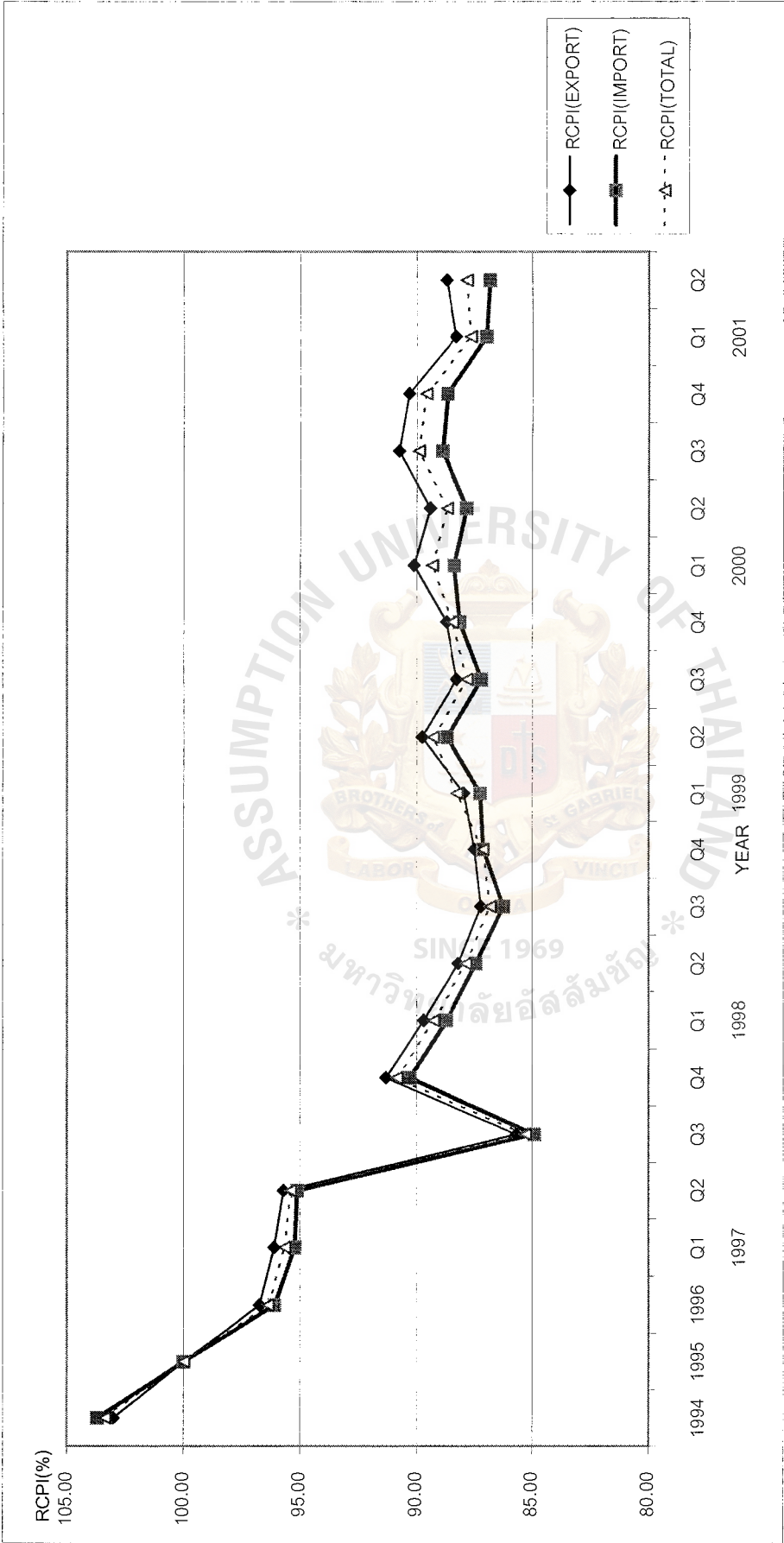


Figure 3.6. Graph for Relative Price Index (Base 1995).

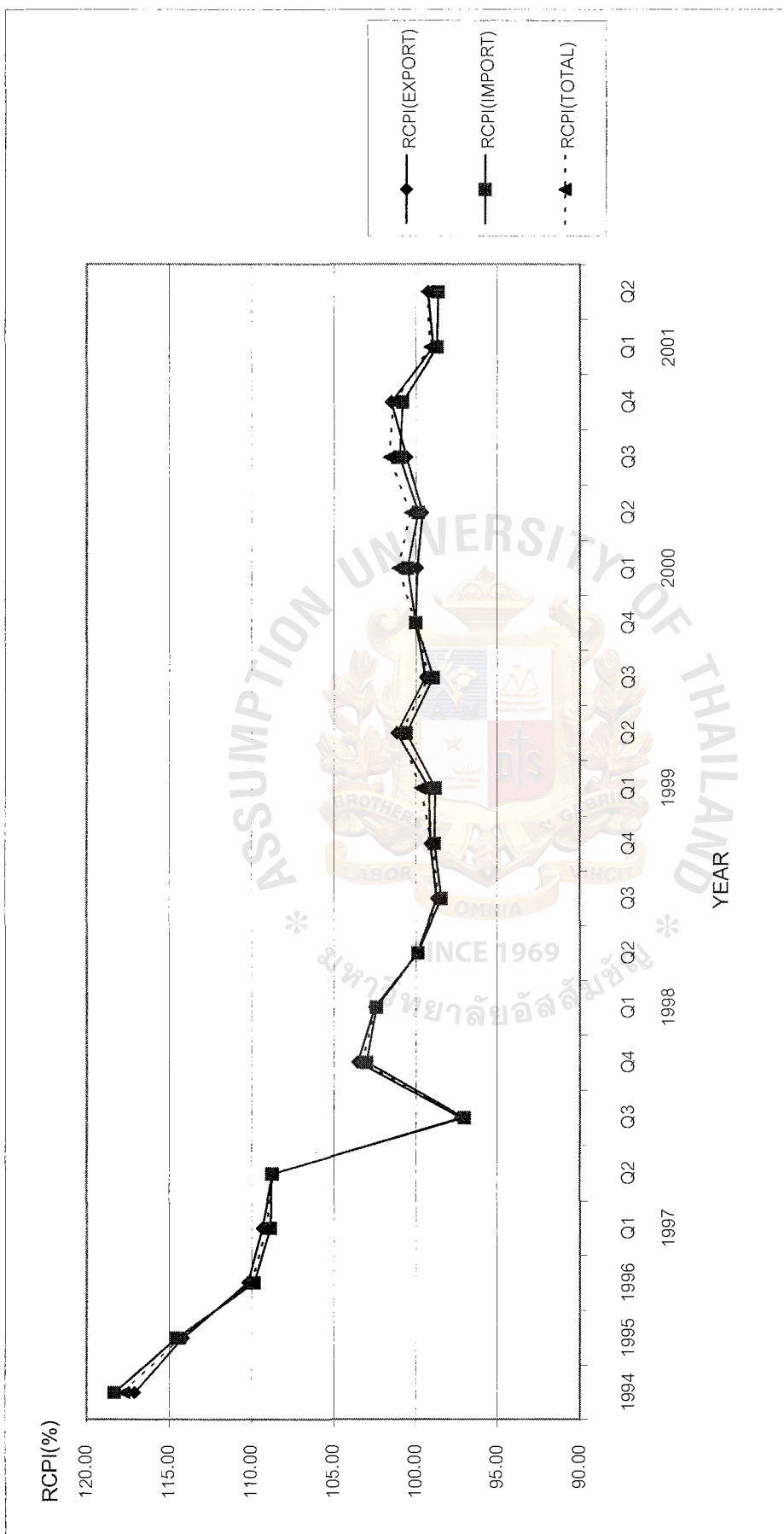


Figure 3.7. Graph for Relative Price Index (Base 1999-Quarter 4).

(3.2) Real Effective Exchange rate

$$\text{REER} = \frac{\text{NEER}}{\text{RCPI}}$$

(Tables 8 and 9, Figures 11 and 12)

REER = Real Effective Exchange Rate Index for Baht

Whereas:

REER = REER weighted against Export Trade

$$\text{REER}_E = \frac{\text{NEER}_E}{\text{RCPI}_E}$$

REER_I = REER weighted against Import Trade

$$\text{REER}_I = \frac{\text{NEER}_I}{\text{RCPI}_I}$$

REER_T = REER weighted against Total Trade

$$\text{REER}_T = \frac{\text{NEER}_T}{\text{RCPI}_T}$$

*** REER must be compared with base year

Table 3.8. Real Effective Exchange Rate (Base 1995).

| TRADE BY COUNTRY BASE 1995 | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|-------------------------------|-------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|
| | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 REER(Export) | 95.29 | 100.00 | 103.34 | 100.34 | 96.73 | 91.50 | 64.79 | 57.91 | 67.73 | 64.60 | 73.47 |
| 2 REER(Import) | 97.98 | 100.00 | 98.81 | 90.35 | 93.28 | 91.54 | 63.16 | 55.93 | 70.31 | 70.00 | 74.90 |
| 3 REER(Total) | 95.90 | 100.00 | 101.19 | 94.87 | 94.36 | 90.08 | 62.08 | 55.06 | 65.99 | 63.23 | 70.92 |

| TRADE BY COUNTRY BASE 1995 | 1999 | | | | 2000 | | | | 2001 | |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 REER(Export) | 77.74 | 72.79 | 71.44 | 71.42 | 77.67 | 74.67 | 67.78 | 67.36 | 71.30 | 67.47 |
| 2 REER(Import) | 72.92 | 79.18 | 81.50 | 79.50 | 80.12 | 83.71 | 77.21 | 68.90 | 66.25 | 70.39 |
| 3 REER(Total) | 72.37 | 72.31 | 71.98 | 71.89 | 76.34 | 76.22 | 69.02 | 65.94 | 67.91 | 66.91 |

Table 3.9. Real Effective Exchange Rate (Base 1999-Quarter4).

| TRADE BY COUNTRY BASE 1999 | | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|-------------------------------|--------------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|--------|
| | | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | REER(Export) | 132.32 | 138.26 | 143.19 | 139.23 | 134.43 | 127.27 | 90.20 | 79.98 | 94.37 | 90.09 | 102.38 |
| 2 | REER(Import) | 122.57 | 124.63 | 123.39 | 112.84 | 116.47 | 114.38 | 79.02 | 69.13 | 87.85 | 87.54 | 94.22 |
| 3 | REER(Total) | 132.43 | 137.53 | 139.44 | 130.84 | 130.23 | 124.43 | 85.88 | 75.43 | 91.28 | 87.57 | 98.15 |

| TRADE BY COUNTRY BASE 1999 | | 1999 | | | | 2000 | | | | 2001 | | | |
|-------------------------------|--------------|--------|--------|--------|--------|--------|--------|-------|-------|--------|-------|-------|-------|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | REER(Export) | 108.81 | 101.96 | 100.11 | 100.00 | 110.58 | 105.82 | 96.53 | 94.61 | 100.45 | 95.17 | 95.17 | 95.17 |
| 2 | REER(Import) | 91.91 | 99.63 | 102.54 | 100.00 | 100.57 | 105.10 | 96.98 | 86.50 | 83.35 | 88.45 | 88.45 | 88.45 |
| 3 | REER(Total) | 100.73 | 100.64 | 100.20 | 100.00 | 106.08 | 105.94 | 96.03 | 91.63 | 94.47 | 93.06 | 93.06 | 93.06 |

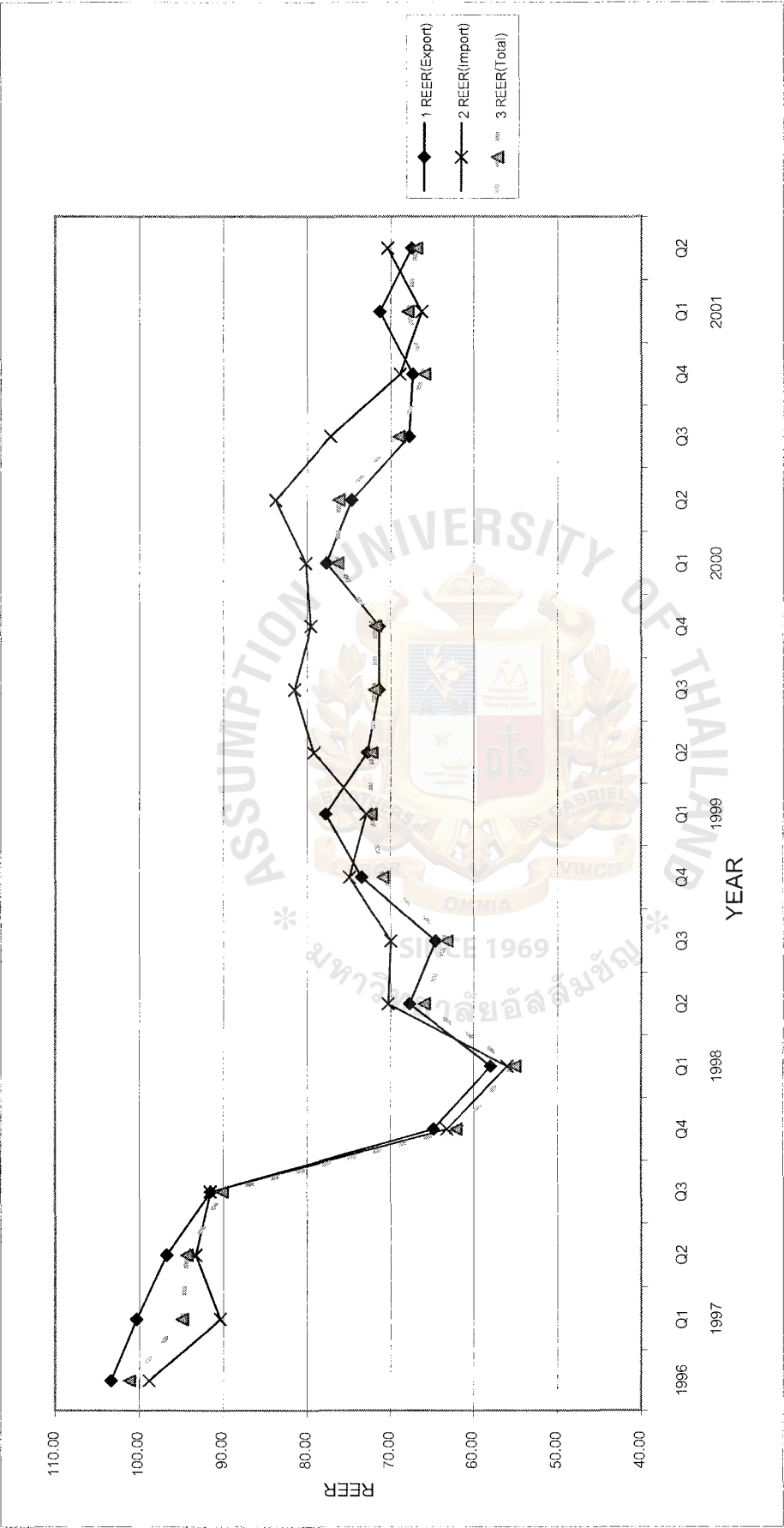


Figure 3.8. Graph for Real Effective Exchange Rate (Base 1995).

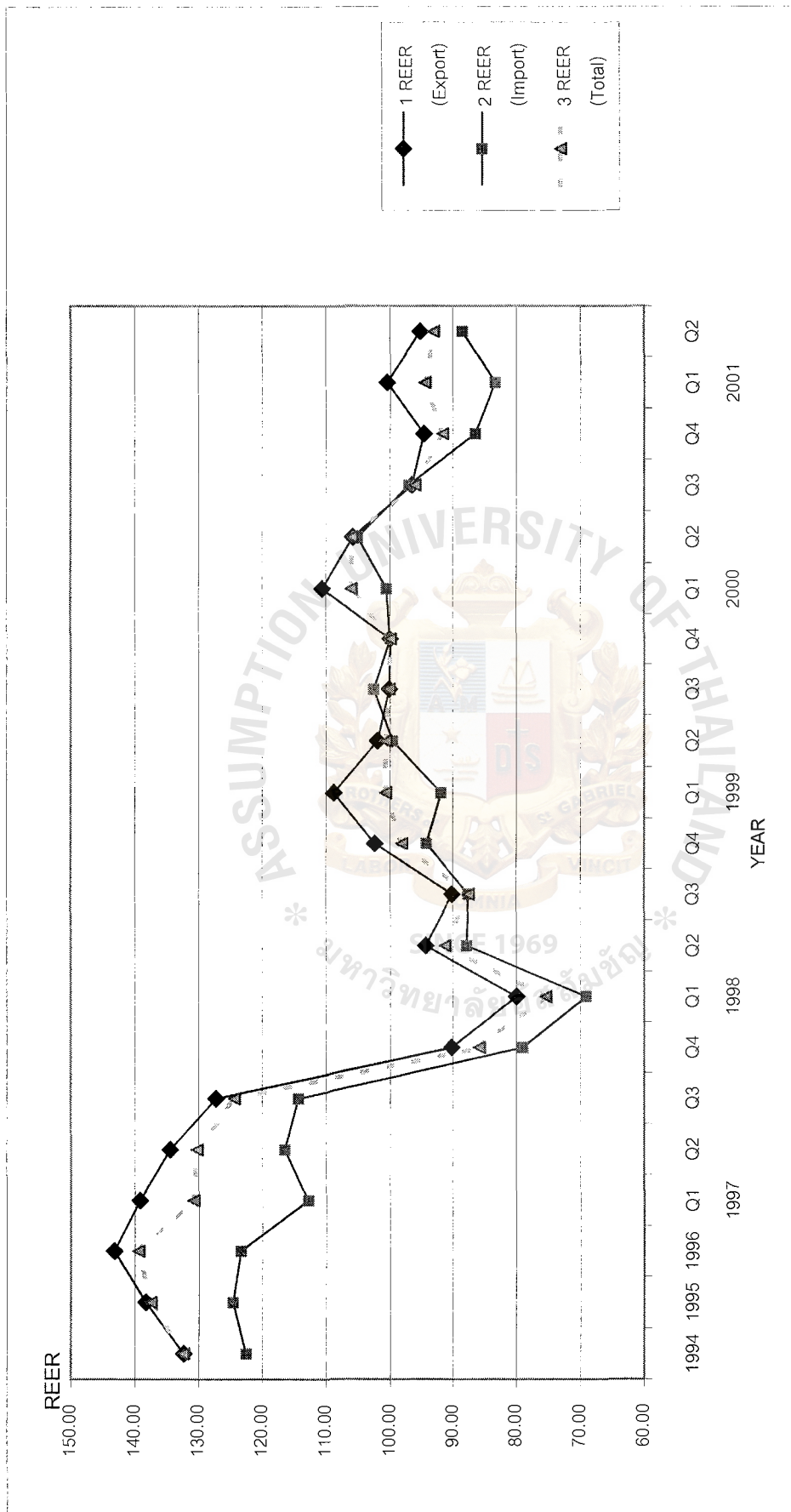


Figure 3.9. Graph for Real Effective Exchange Rate (Base 1999- Quarter4).

IV. ANALYSIS AND EVALUATION

This part is the analysis of the level of appropriate exchange rate. Time period used in this analysis has been divided into 2 cases as follows:

Case 1: Data will be separated into 2 parts as follow:

- (1) The data on year 1994 –1996 -Analyze yearly
- (2) The data on year 1997 –June 2001 – Analyze quarterly

In this case I will use year1995 as the base period for calculating the index for Thai Baht. Because in that period our Thai currency was in stabilization level and also the basket of currency was used.

Case 2: Data will be separated into 2 parts as follows:

- (1) The data on year 1994 –1996 - Analyze yearly
- (2) The data on year 1997 –June 2001 – Analyze quarterly

I will use quarter 4 of year 1999 as the base period because the Thai currency was much more stable after the turmoil of managed float system.

4.1 Analysis and Evaluation the Tendency of Real Effective Exchange Rate (Compare to the base year 1995)

(a) During 1994 until quarter 2, 1997 (Basket of currency)

In this period we found that REER was fluctuated around 100. It means that the Baht was overvalued according to the Purchasing Power Parity. During this time, the average cost of goods and service in Thailand was higher than foreign countries. So it made the comparative price index between Thai and foreign counties lower than 100. It means that the increasing in domestic price level should result in an equiproportionate depreciation of exchange rate and also export slowdown in the affected country according to the Purchasing Power Parity, the REER should be downward in order to maintain the stable of exchange rate level but in reality, REER in that period have tended to go upward .The reason was that the government announced the basket of currencies so the Baht appreciated according to currencies in the basket and there were some signals after 1996 that the REER was to continually decrease because of the economic problems in Japan and also especially strengthened in US Dollar against the major currencies in year 1996. This movement is conversed to the theory, so the result of REER is quite high in this period.

(b) The quarter 3 of year1997 until 2001-quarter 2 (The Floated exchange rate)

Thailand economy faced severe difficulties in year 1997,mainly as a result of the bubble economy and currency turmoil in Asian Country and also the financial problems resulted in a rapid deceleration of investment growth and the exchange rate continued to weaken. Then the government

would like to end up the uncertainty situation. So they abandoned the basket of currency and replaced it with Managed Floating System.

In this period, they were sharply decreased in REER especially in Q3 of 1997 until quarter 1 of 1998. So it means that the Baht was depreciated or undervalued according to the Purchasing Power Parity. Eventhough the price of goods and service in Thailand is still higher than other countries, the comparative price index between Thailand and other country was lower than 100 all the time. By the way, a sharp decrease in REER in year 1997 until 1998 Quarter 1., demonstrated the continuously devaluation of Baht. Although the Baht has recovered its stability after Quarter 1 of 1998, REER was still lower than 100.

In year 1998 quarter 4, the REER is still continuously increasing because Thai has received the supported fund from Japan so the investors were confident in the recovery of Thai 's fiscal and economy, but REER is still lower than 100 when compared to the base year

Asian currencies have fluctuated heavily since quarter 2 of 1999 because of the political and social factors occurred within the region and of the economic factors occurred within and outside the region, especially the changes of US and Japan's economies, which has a close tie to the region in terms of both trade and investment, the fluctuation of the world oil prices, as the most economies in the region is the net- imported oil countries. However, the impressive economic growth of the United States in 1999 and the region's economic recovery led to the high growth of the imports within the Asian region. The higher imports simultaneously induced the continuing export in this region until year 2000.

In year 1999, a lot of fluctuation of REER took place because of Asian countries crisis in that period. And it continued to decline in year 2000 because the government was unable to triton the economic situation for instance:

- (a) The political uncertainties and social unrest in some Asian Countries.
- (b) The lack of sign of the sustainable economic recovery
- (c) The Laggard business and economic restructuring of some countries
- (d) The large slowdown of the us economy and to the smaller extent for the European economy
- (e) Japan's fragile economic
- (f) The fluctuation of the worlds oil prices.

In year 2001 quarter 1 and 2, REER are still continuing to decline but less fluctuated than year 2000, it means that Baht is still depreciated. The factors that effect the exchange rate are:

Internal factors

- (1) Supporting the weakness of Baht
 - (a) Market expectation toward the government's policy in allowing Baht to depreciate as this would benefit to the exports.
 - (b) Confusion over the direction of interest rates policy following the change of the Governor of the bank of Thailand.
 - (c) Uncertainty of the new issuance of FX report form, which has been postponed until further notification.
 - (d) Political dimension, in particular the lack of clarity of the new government policy
 - (e) The Slow down of Thai economic

(2) Supporting the value of Baht

During the first quarter, mid May and early June, the new formation of the government in which Thai Rat Thai Party obtained the majority vote. Market anticipation of the tighten monetary Policy and concern over the bank of Thailand action's on the restriction of the foreign exchange rate transaction of the nonresidents. As a consequence financial institution on the offshore market began to sell of the US dollar resulting in the rebound of Baht Value

External factors:

The Sharp depreciation of Japanese Yen due to the slow down of Japan's economy along with the direction of regional currencies such as Philippine's Peso and Indonesia's Rupiah, Singapore's Dollar, or Taiwan's Dollar and also the Political problem in Indonesia that affect the Thai Baht currency.

In conclusion the Baht deprecation in the first 6 months of the year is response to Baht internal and external factor. However, the deprecation of Baht is relative to minor when compared with the other currencies in the Asian such as Indonesia Rupiah, South Korea won, Singapore dollar during the same period. Nevertheless, the Baht at the end of June appreciated in response to the internal factors in particular, the more stringent monetary measurement and tighten regulation against foreign exchange rate transaction of the non-resident as above.

4.2 Analysis the Tendency of Real Effective Exchange Rate (Compare to the base year 1999 – Quarter 4)

(a) During 1994 until quarter 2 1997 (Basket of currency)

In this period we found that REER was higher than 100 until 1997 Quarter 2. It means that the Baht was overvalued according to the Purchasing Power Parity. During this time, the average cost of goods in Thailand was higher than foreign countries. So it made the comparative price index between Thai and foreign countries was than 100. It means that increasing in domestic price level should result in an equiproportionate depreciation of exchange rate according to the Purchasing Power Parity, the REER should be downward in order to maintain the stable of exchange rate level but in reality, REER in that period have tended to go upward .The reason was that the government announced the basket of currencies, so the Baht appreciated according to currencies in the basket and especially strengthened in US Dollar against the major currencies in year 1996 . This movement is conversed to the theory, so the result of REER is quite high in this period.

(b) During the quarter 3 of year 1997 until 2001-Quarter 2(The Floated exchange rate)

In this period, REER was sharply decreased especially in Quarter 3 of 1997 until Quarter 1 of 1998. So it means that the Baht was depreciated or undervalued according to the Purchasing Power Parity. Eventhough the price of goods and service in Thailand is still higher than other countries, the comparative price index between Thai and other country was lower than 100 all the time. By the way a sharp decrease in REER in year 1997 until

1998 quarter1 demonstrated that the continuous devaluation of Baht. Although the Baht has recovered its stability after Quarter 1 of 1998, REER was still lower than 100.

In year 1998 quarter 3 the REER was still continuously increasing because of many factors for example Thailand has received the supported fund from Japan, so the investors were confident in the recovery of Thailand's fiscal and economy but REER is still lower than 100 when compared to the base year

In year 1999, REER was still fluctuation but less than other period and there were some signals of equilibrium in quarter 2 until 4. It was a very short period of stabilization. After that there were Asian countries crisis in that period and it continued to decline in year 2000 because of their government unable to cover the economic situation.

In year 2001 quarter 1 and 2, REER still continues to decline but less fluctuated than year 2000 because of some unsustainable of economic recovery and political factor both internally and externally.

V. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Real Effective Exchange rate is most often constructed to measure the change in a country's competitiveness, generally some measures of international trade are used to calculate the weights. For that reason, effective exchange rate measure not only the international economic activity but also the exchange rate value of one country is determined by supply and demand forces involving the international exchange of goods and services and asset.

As from 2 November 1984, the Baht values had been set in reference to a basket of currencies of Thailand's major trading partners. The exchange rate of Thai against the US dollar was announced daily by the Exchange rate Equalization Fund, which stood ready to buy and sell US dollars with the commercial banks at determined rates. This system resulted in the Baht becoming one of the most stable currencies in the world and supported Thailand's rapid growth over the year.

The tight monetary policy followed by the Bank of Thailand in since 1995 in order to incipient pressures on inflation and current account have had the desired effect on economic stability. However, the coincidental sharp slowdown of exports and capital inflows in 1996 together with problem of financial institutions resulted in a rapid deceleration of investment and growth. Calls for the relaxation of monetary policy evoked widespread speculation of exchange rate policy might be adjusted to allow for reductions in interest rates. While the authorizers' interventions were successful in containing speculative pressure in foreign exchange markets. The confidence of domestic business in the authorizers's exchange rate policy continues to weaken in the wake of widespread speculation and criticism. In order to end uncertainty over Thailand's exchange rate policy, the Bank of Thailand announced the Managed Float in 2 July

1997, Thailand faces a lot of crisis and also a lot of fluctuation in the exchange rate and economic etc. Everybody would like to know what is the appropriate level of exchange rate is or when our exchange rate is equilibrium.

After analyzed and evaluated the result by applying the theory of Purchasing Power Parity, the results are that the Real Effective Exchange Rate at present is Lower than 100 (compared to the base year 1995) but when compared to base quarter 4 of 1999, the Real Effective Exchange Rate (REER) is higher than 100. It means real Effective Exchange Rate of Baht is overvalued or appreciated. The appropriate equilibrium exchange rate should be around 100 or equal to base year.

The Effect of the Overvaluation as follows:

- (1) Lost in external competitiveness leads to reduction of exports and increase in consumption of cheaper imports though the trade deficit can temporarily be financed by aid, reserves and borrowing, these liabilities will ultimately need to be financed by trade surpluses in the future.
- (2) Loss of domestic production, employment and fiscal revenue as firms can no longer profitably compete and eventually stop production altogether resulting in loss of jobs and tax revenue.
- (3) Domestic financial market is harmed as traders try to borrow in domestic currency to finance the buildup of imports or to carry stocks of exports that are held off pending devaluation. As interest rates increase, this borrowing hurts other sectors and the government will have to bail out the financial system when bank fails due to speculation.
- (4) Finally, an external balance crisis brought by the preceding factor results in ultimate devaluation. Speculators who anticipate a devaluation as they suspect the currency is no longer sustainable will shift to dollars and other

foreign currencies or will buy even more imports of underpriced goods while withholding exports so that imported goods will command high domestic prices.

In the analysis, if we calculate REER with different base year, we will get the different value of REER which can create the overvalue or undervalue of currency. From the analysis; I have found something that if I use different base year in calculation but the trend of movement in REER is the same, it will still move in the same direction.

In my idea, if I use the base year of 1999, quarter 4, the result will be more correct and accurate than using 1995 as base because during 1994- 1997 Baht was overvalued because of the basket of currency and the exchange rate was not changed according to the market mechanism.

In order to measure the level of appropriate exchange rate, in theory we use the long-run equilibrium exchange rate which indicates the direction of long term Baht index moving to the equilibrium which supply equal to the demand of currency. That is the equilibrium of exchange rate. In this project, I found that Thai are now moving into the equilibrium but it is in the short period for example during 1999 by using 1999 quarter 4 as base) with Baht equal to 38.8061 / US dollar but we should consider other factors that effect exchange rate, for instance: inflation, political, disaster, social and economic factors and also the movement of the developed countries (Japan, USA or etc.). Normally Baht currency will be easily effected by these factors. If REER changes a little bit which is around 100 in the long period, it should be in the equilibrium but the equilibrium point can be changed all the time, it depends on the demand and supply of currency and other factors in that period. After a long movement , it will adjust in to the new equilibrium for a long period which is called the new equilibrium point.

5.2 Recommendation

After the exchange rate system changes from the Basket of Currency to the Managed Float system, we face a lot of crisis. In that period, it was like the devaluation of the currency because of the Baht before that period was overvalued when compared to the reality. Therefore, in the first period of 1997 –1998 a lot of fluctuation of exchange rate took place according to the expectation of the Bank of Thailand. During 1997, the government tried to intervene the foreign exchange rate market by buying and selling US Dollar in the market in order to decrease the variance and also stabilize the exchange rate quickly. The intervention of the government had caused a lot of problems to the exchange rate system; for example it did not move according to the exchange rate market mechanism. This action was not interpolate with the Purchasing Power Parity Theory. If the government continues to intervene the exchange rate, it will not be a good idea because a lot of foreign investors will not be confident in the direction of the fiscal and monetary policy in Thailand. In my idea, I think that if the exchange rate is in the equilibrium, the government should not intervene it. They should let them move according to the market mechanism.

5.3 Future Research

We can use other method to calculate the Real Effective Exchange Rate as follow

- (1) Weighted value, we may use other weighted average such as double weighted average which is resolve the weak point of Bilateral and Multilateral Weighting Method.
- (2) In study the equilibrium of exchange rate, we can use other theories rather than use Relative Purchasing Power Parity, for instance Underlying Payments Disequilibrium, Asset –Market Disturbances Approach and

Macroeconomic Balance. Each method is a good tool in measuring the appropriate level of exchange rate





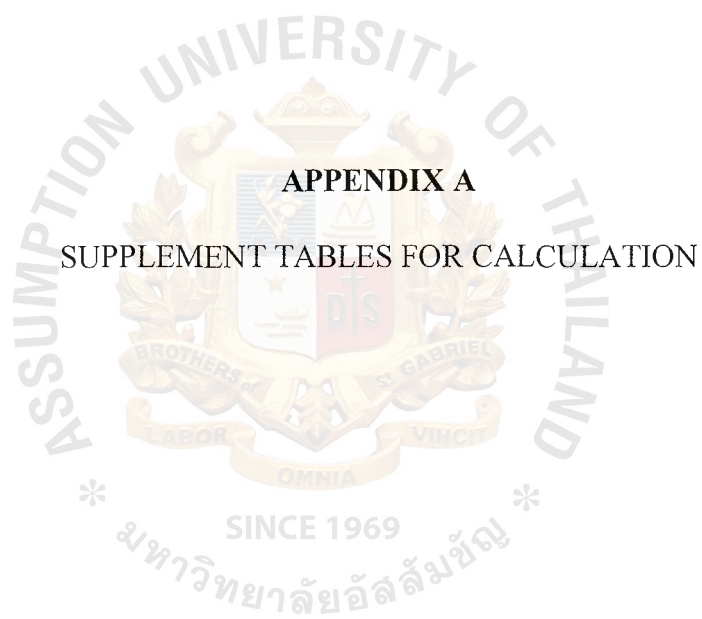


Table A.1. Rates of Exchange of Commercial Bank in Bangkok Metropolis.

| (Baht per currency unit) | | | 1994 | 1995 | 1996 | 1997 | |
|--------------------------|--------------------|---------|---------|---------|---------|---------|---------|
| | | | | | | Q1 | Q2 |
| 1 | U.S. dollar | Buying | 25.0498 | 24.8151 | 25.2439 | 25.7626 | 25.7997 |
| | | Selling | 25.1998 | 24.9651 | 25.3939 | 25.9126 | 25.9497 |
| | | mid | 25.1498 | 24.9151 | 25.3439 | 25.8626 | 25.8997 |
| 2 | Japanese yen | Buying | 0.2447 | 0.2646 | 0.2317 | 0.2123 | 0.2157 |
| | | Selling | 0.2472 | 0.2675 | 0.2335 | 0.2144 | 0.2179 |
| | | mid | 0.2460 | 0.2661 | 0.2326 | 0.2134 | 0.2168 |
| 3 | Singapore dollar | Buying | 16.3009 | 17.3859 | 17.7767 | 18.0238 | 17.8569 |
| | | Selling | 16.6162 | 17.7410 | 18.1390 | 18.3874 | 18.2141 |
| | | mid | 16.4586 | 17.5634 | 17.9578 | 18.2056 | 18.0355 |
| 4 | Netherland guilder | Buying | 13.7700 | 15.4521 | 14.9512 | 13.8175 | 13.3731 |
| | | Selling | 13.9307 | 15.6271 | 15.1239 | 13.9782 | 13.5296 |
| | | mid | 13.8503 | 15.5396 | 15.0376 | 13.8978 | 13.4514 |
| 5 | Deutsche mark | Buying | 15.3638 | 17.3094 | 16.7570 | 15.5386 | 15.0521 |
| | | Selling | 15.5891 | 17.4763 | 16.9046 | 15.6775 | 15.1850 |
| | | mid | 15.4764 | 17.3929 | 16.8308 | 15.6081 | 15.1185 |
| 6 | Hong Kong dollar | Buying | 3.2322 | 3.1990 | 3.2548 | 3.3175 | 3.3220 |
| | | Selling | 3.2697 | 3.2363 | 3.3007 | 3.3554 | 3.3601 |
| | | mid | 3.2509 | 3.2176 | 3.2777 | 3.3365 | 3.3411 |
| 7 | Chinese renminbi | Buying | 2.8250 | 2.8069 | 2.7959 | 2.8550 | 2.8593 |
| | | Selling | 2.9544 | 3.0772 | 3.1965 | 3.2629 | 3.2666 |
| | | mid | 2.8897 | 2.9420 | 2.9962 | 3.0590 | 3.0629 |
| 8 | Pound sterling | Buying | 38.2998 | 39.1159 | 39.3596 | 42.0061 | 42.1443 |
| | | Selling | 38.6359 | 39.4572 | 39.7228 | 42.3827 | 42.5215 |
| | | mid | 38.4678 | 39.2866 | 39.5412 | 42.1944 | 42.3329 |
| 9 | Malaysian rigget | Buying | 9.5160 | 9.8555 | 9.9948 | 10.3224 | 10.2452 |
| | | Selling | 9.6476 | 9.9958 | 10.1357 | 10.4676 | 10.3885 |
| | | mid | 9.5818 | 9.9257 | 10.0653 | 10.3950 | 10.3169 |

Table A.1. Rates of Exchange of Commercial Bank in Bangkok Metropolis. (Continued)

| (Baht per currency unit) | | | 1997 | | 1998 | | |
|--------------------------|--------------------|---------|---------|---------|---------|---------|---------|
| | | | Q3 | Q4 | Q1 | Q2 | Q3 |
| 1 | U.S. dollar | Buying | 32.6752 | 40.3793 | 46.7316 | 39.9663 | 40.7360 |
| | | Selling | 33.1755 | 40.8888 | 47.4049 | 40.5424 | 41.2701 |
| | | mid | 33.0121 | 40.7149 | 47.1148 | 40.3251 | 41.0583 |
| 2 | Japanese yen | Buying | 0.2758 | 0.3210 | 0.3640 | 0.2933 | 0.2904 |
| | | Selling | 0.2818 | 0.3264 | 0.3712 | 0.2992 | 0.2961 |
| | | mid | 0.2788 | 0.3237 | 0.3676 | 0.2963 | 0.2933 |
| 3 | Singapore dollar | Buying | 21.8076 | 25.0795 | 27.5963 | 24.1065 | 23.3985 |
| | | Selling | 22.4178 | 25.5225 | 28.4066 | 24.8235 | 24.0450 |
| | | mid | 22.1127 | 25.3010 | 28.0015 | 24.4650 | 23.7218 |
| 4 | Netherland guilder | Buying | 16.0146 | 20.3617 | 22.7380 | 19.7306 | 20.4443 |
| | | Selling | 16.3582 | 20.7332 | 23.2082 | 20.1330 | 20.8377 |
| | | mid | 16.1864 | 20.5474 | 22.9731 | 19.9318 | 20.6410 |
| 5 | Deutsche mark | Buying | 18.0511 | 22.9642 | 25.6490 | 22.2484 | 23.0776 |
| | | Selling | 18.3153 | 23.2380 | 26.1298 | 22.6659 | 23.4835 |
| | | mid | 18.1832 | 23.1011 | 25.8894 | 22.4571 | 23.2806 |
| 6 | Hong Kong dollar | Buying | 4.2047 | 5.2002 | 6.0205 | 5.1429 | 5.2410 |
| | | Selling | 4.2956 | 5.2972 | 6.1448 | 5.2473 | 5.3412 |
| | | mid | 4.2502 | 5.2487 | 6.0826 | 5.1951 | 5.2911 |
| 7 | Chinese renminbi | Buying | 3.8227 | 4.7662 | 5.4551 | 4.6775 | 4.7112 |
| | | Selling | 4.0870 | 5.0681 | 5.8693 | 5.0282 | 5.1680 |
| | | mid | 3.9548 | 4.9172 | 5.6622 | 4.8529 | 4.9396 |
| 8 | Pound sterling | Buying | 52.9355 | 66.9227 | 76.6283 | 65.8839 | 67.1541 |
| | | Selling | 53.9945 | 68.0328 | 78.0977 | 67.1338 | 68.3208 |
| | | mid | 53.4650 | 67.4777 | 77.3630 | 66.5089 | 67.7375 |
| 9 | Malaysian rigget | Buying | 11.7234 | 11.5152 | 11.5239 | 10.2671 | 9.9542 |
| | | Selling | 12.0010 | 11.7813 | 11.9253 | 10.6383 | 10.3000 |
| | | mid | 11.8622 | 11.6483 | 11.7246 | 10.4527 | 10.1271 |

Table A.1. Rates of Exchange of Commercial Bank in Bangkok Metropolis. (Continued)

| (Baht per currency unit) | | | 1998 | 1999 | | | | 2000 |
|--------------------------|--------------------|---------|---------|---------|---------|---------|---------|---------|
| | | | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 |
| 1 | U.S. dollar | Buying | 36.6766 | 36.7948 | 36.9629 | 38.0991 | 38.5997 | 37.4284 |
| | | Selling | 37.1227 | 37.1821 | 37.2970 | 38.4144 | 38.9415 | 37.7661 |
| | | mid | 36.9520 | 37.0510 | 37.1795 | 38.3132 | 38.8061 | 37.6543 |
| 2 | Japanese yen | Buying | 0.3054 | 0.3147 | 0.3045 | 0.3353 | 0.3678 | 0.3482 |
| | | Selling | 0.3117 | 0.3209 | 0.3100 | 0.3410 | 0.3743 | 0.3545 |
| | | mid | 0.3086 | 0.3178 | 0.3072 | 0.3381 | 0.3710 | 0.3514 |
| 3 | Singapore dollar | Buying | 22.1493 | 21.4749 | 21.4495 | 22.4098 | 22.9388 | 21.9575 |
| | | Selling | 22.7550 | 21.9787 | 21.9003 | 22.8424 | 23.3855 | 22.3715 |
| | | mid | 22.4522 | 21.7268 | 21.6749 | 22.6261 | 23.1622 | 22.1645 |
| 4 | Netherland guilder | Buying | 19.5027 | 18.6918 | 17.6722 | 18.0582 | 18.1436 | 16.7104 |
| | | Selling | 19.8690 | 19.0177 | 17.9663 | 18.3445 | 18.4513 | 17.0029 |
| | | mid | 19.6858 | 18.8547 | 17.8192 | 18.2013 | 18.2975 | 16.8566 |
| 5 | Deutsche mark | Buying | 21.9898 | 21.0626 | 19.9119 | 20.3449 | 20.4458 | 18.8343 |
| | | Selling | 22.3875 | 21.4316 | 20.2444 | 20.6715 | 20.7893 | 19.1547 |
| | | mid | 22.1887 | 21.2471 | 20.0782 | 20.5082 | 20.6176 | 18.9945 |
| 6 | Hong Kong dollar | Buying | 4.7182 | 4.7310 | 4.7460 | 4.8845 | 4.9446 | 4.7911 |
| | | Selling | 4.8058 | 4.8126 | 4.8246 | 4.9614 | 5.0250 | 4.8661 |
| | | mid | 4.7620 | 4.7718 | 4.7853 | 4.9229 | 4.9848 | 4.8286 |
| 7 | Chinese renminbi | Buying | 4.2277 | 4.2990 | 4.3496 | 4.5586 | 4.5929 | 4.4014 |
| | | Selling | 4.6675 | 4.6121 | 4.5764 | 4.6655 | 4.7361 | 4.6092 |
| | | mid | 4.4476 | 4.4555 | 4.4630 | 4.6120 | 4.6645 | 4.5053 |
| 8 | Pound sterling | Buying | 61.3253 | 59.9645 | 59.2326 | 60.8551 | 62.8298 | 60.0444 |
| | | Selling | 62.3820 | 60.8969 | 60.0767 | 61.6650 | 63.6959 | 60.8848 |
| | | mid | 61.8537 | 60.4307 | 59.6546 | 61.2600 | 63.2629 | 60.4646 |
| 9 | Malaysian ringgit | Buying | 9.4703 | 9.4957 | 9.4743 | 9.7305 | 9.9298 | 9.6832 |
| | | Selling | 9.9067 | 9.8972 | 9.8295 | 10.0395 | 10.2045 | 9.9180 |
| | | mid | 9.6885 | 9.6965 | 9.6519 | 9.8850 | 10.0672 | 9.8006 |

Table A.1. Rates of Exchange of Commercial Bank in Bangkok Metropolis. (Continued)

| (Baht per currency unit) | | | 2000 | | | 2001 | |
|--------------------------|--------------------|---------|---------|---------|---------|---------|---------|
| | | | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 | U.S. dollar | Buying | 38.4547 | 40.7859 | 43.1449 | 43.0161 | 45.1971 |
| | | Selling | 38.7645 | 41.0897 | 43.4573 | 43.3245 | 45.5027 |
| | | mid | 38.6615 | 40.9905 | 43.3423 | 43.2198 | 45.3920 |
| 2 | Japanese yen | Buying | 0.3591 | 0.3774 | 0.3912 | 0.3629 | 0.3674 |
| | | Selling | 0.3653 | 0.3837 | 0.3976 | 0.3686 | 0.3728 |
| | | mid | 0.3622 | 0.3806 | 0.3944 | 0.3657 | 0.3701 |
| 3 | Singapore dollar | Buying | 22.2289 | 23.4268 | 24.6171 | 24.4735 | 24.8265 |
| | | Selling | 22.6241 | 23.8167 | 25.0172 | 24.8601 | 25.1876 |
| | | mid | 22.4265 | 23.6218 | 24.8172 | 24.6668 | 25.0070 |
| 4 | Netherland guilder | Buying | 16.2236 | 16.6778 | 16.9461 | 17.9403 | 17.8326 |
| | | Selling | 16.5018 | 16.9586 | 17.2336 | 18.2308 | 18.1192 |
| | | mid | 16.3627 | 16.8182 | 17.0899 | 18.0855 | 17.9759 |
| 5 | Deutsche mark | Buying | 18.2864 | 18.7975 | 19.0991 | 20.2197 | 20.1014 |
| | | Selling | 18.5892 | 19.1043 | 19.4130 | 20.5372 | 20.4092 |
| | | mid | 18.4378 | 18.9509 | 19.2560 | 20.3784 | 20.2553 |
| 6 | Hong Kong dollar | Buying | 4.9136 | 5.2049 | 5.5082 | 5.4916 | 5.7748 |
| | | Selling | 4.9895 | 5.2827 | 5.5866 | 5.5686 | 5.8471 |
| | | mid | 4.9516 | 5.2438 | 5.5474 | 5.5301 | 5.8109 |
| 7 | Chinese renminbi | Buying | 4.4893 | 4.7090 | 4.8795 | 4.8689 | 5.1374 |
| | | Selling | 4.7112 | 4.8591 | 5.0455 | 4.9888 | 5.2700 |
| | | mid | 4.6003 | 4.7841 | 4.9625 | 4.9288 | 5.2037 |
| 8 | Pound sterling | Buying | 58.7818 | 60.0673 | 62.2651 | 62.5768 | 64.0507 |
| | | Selling | 59.5773 | 60.8463 | 63.0848 | 63.3896 | 64.8578 |
| | | mid | 59.1795 | 60.4568 | 62.6749 | 62.9832 | 64.4542 |
| 9 | Malaysian rigget | Buying | 10.0175 | 10.6327 | 11.2478 | 11.1468 | 11.6846 |
| | | Selling | 10.2564 | 10.8736 | 11.4970 | 11.3957 | 12.1122 |
| | | mid | 10.1369 | 10.7532 | 11.3724 | 11.2713 | 11.8984 |

Table A.2. Total Export Trade.

| Exports (1: Millions of Baht) | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|----------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 United States | 239,098 | 250,684 | 253,800 | 61,533 | 68,885 | 102,261 | 121,873 | 134,027 | 115,362 | 136,419 | 114,980 |
| 2 Japan | 194,274 | 236,101 | 237,523 | 58,561 | 55,957 | 72,796 | 83,451 | 91,453 | 70,811 | 75,114 | 71,037 |
| 3 Singapore | 155,051 | 197,320 | 171,042 | 44,113 | 42,631 | 50,021 | 62,681 | 58,355 | 47,744 | 46,742 | 41,646 |
| 4 Netherlands | 31,628 | 44,881 | 45,384 | 11,667 | 10,500 | 15,166 | 20,816 | 26,403 | 19,851 | 19,703 | 23,651 |
| 5 Germany | 40,031 | 40,817 | 40,827 | 9,361 | 8,896 | 11,457 | 14,925 | 17,679 | 15,647 | 15,652 | 15,019 |
| 6 Hong Kong | 59,989 | 72,775 | 82,121 | 20,722 | 22,162 | 28,863 | 35,792 | 35,487 | 27,786 | 27,847 | 24,067 |
| 7 China | 23,338 | 40,868 | 47,371 | 10,968 | 10,300 | 14,237 | 19,992 | 22,684 | 15,092 | 16,665 | 18,413 |
| 8 United Kingdom | 33,819 | 40,338 | 46,561 | 10,273 | 10,497 | 17,944 | 27,728 | 27,785 | 18,869 | 22,578 | 19,221 |
| 9 Malaysia | 27,632 | 38,723 | 51,071 | 15,191 | 17,160 | 20,705 | 24,623 | 20,644 | 18,900 | 16,802 | 16,901 |
| | 804,860 | 962,507 | 975,700 | 242,389 | 246,988 | 333,450 | 411,881 | 434,517 | 350,062 | 377,522 | 344,935 |

Source: the monthly economic report of the Bank of Thailand in July 2001

Table A.2. Total Export Trade (Continued).

| Exports (1: Millions of Baht) | | 1999 | | | | 2000 | | | | 2001 | |
|----------------------------------|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 | United States | 97,813 | 114,847 | 129,522 | 137,179 | 123,533 | 132,615 | 168,363 | 167,310 | 139,583 | 144,098 |
| 2 | Japan | 72,265 | 70,153 | 77,705 | 91,720 | 95,784 | 93,018 | 104,127 | 117,750 | 115,547 | 110,286 |
| 3 | Singapore | 39,479 | 46,517 | 48,469 | 56,562 | 51,921 | 51,930 | 64,395 | 73,738 | 53,370 | 59,685 |
| 4 | Netherlands | 20,893 | 18,459 | 20,956 | 22,837 | 20,485 | 18,121 | 24,623 | 27,308 | 25,977 | 22,914 |
| 5 | Germany | 13,108 | 13,233 | 13,452 | 15,406 | 14,918 | 14,877 | 17,526 | 18,605 | 18,809 | 17,580 |
| 6 | Hong Kong | 25,203 | 27,454 | 29,366 | 30,555 | 29,685 | 32,454 | 39,310 | 38,407 | 33,857 | 35,920 |
| 7 | China | 15,141 | 15,262 | 18,186 | 21,980 | 26,452 | 21,937 | 26,809 | 38,084 | 28,960 | 30,761 |
| 8 | United Kingdom | 16,652 | 18,627 | 20,416 | 23,501 | 19,687 | 20,540 | 26,343 | 28,579 | 25,132 | 24,957 |
| 9 | Malaysia | 17,393 | 19,252 | 20,162 | 23,653 | 23,546 | 24,594 | 31,640 | 33,631 | 29,447 | 31,263 |
| | | 317,947 | 343,804 | 378,234 | 423,393 | 406,011 | 410,086 | 503,136 | 543,412 | 470,682 | 477,464 |

Source: the monthly economic report of the Bank of Thailand in July 2001

Table A.3. Total Import Trade

| Imports (1: Millions of Baht) | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|----------------------------------|---------|-----------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 United States | 162,064 | 211,947 | 228,974 | 67,412 | 59,779 | 58,063 | 82,049 | 79,781 | 57,214 | 56,163 | 56,589 |
| 2 Japan | 413,323 | 538,711 | 518,107 | 121,127 | 115,518 | 125,544 | 129,890 | 124,796 | 102,023 | 100,829 | 92,649 |
| 3 Singapore | 86,444 | 103,683 | 101,409 | 21,770 | 21,518 | 26,280 | 27,348 | 30,455 | 23,477 | 23,246 | 21,603 |
| 4 Netherlands | 12,608 | 17,397 | 11,667 | 4,499 | 4,335 | 4,921 | 6,598 | 5,302 | 4,311 | 4,965 | 3,842 |
| 5 Germany | 80,025 | 93,407 | 92,608 | 21,308 | 20,952 | 25,558 | 23,253 | 25,422 | 18,923 | 16,527 | 15,384 |
| 6 Hong Kong | 17,362 | 18,581 | 21,641 | 5,303 | 5,754 | 6,804 | 7,542 | 8,970 | 8,539 | 8,040 | 6,064 |
| 7 China | 34,898 | 52,187 | 49,501 | 14,794 | 15,784 | 19,742 | 19,146 | 19,617 | 18,148 | 18,553 | 18,488 |
| 8 United Kingdom | 28,975 | 36,363 | 40,340 | 10,290 | 10,644 | 9,299 | 9,445 | 9,384 | 7,257 | 6,969 | 6,016 |
| 9 Malaysia | 66,366 | 80,582 | 91,380 | 20,745 | 24,803 | 21,406 | 24,625 | 23,732 | 22,674 | 22,741 | 21,150 |
| | 902,065 | 1,152,858 | 1,155,627 | 287,248 | 279,087 | 297,617 | 329,896 | 327,459 | 262,566 | 258,033 | 241,785 |

Source: the monthly economic report of the Bank of Thailand in July 2001

Table A.4. Total Trade.

| Imports (1: Millions of Baht) | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|----------------------------------|-----------|-----------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 United States | 401,162 | 462,631 | 482,774 | 128,945 | 128,664 | 160,324 | 203,922 | 213,808 | 172,576 | 192,582 | 171,569 |
| 2 Japan | 607,597 | 774,812 | 755,630 | 179,688 | 171,475 | 198,340 | 213,341 | 216,249 | 172,834 | 175,943 | 163,686 |
| 3 Singapore | 241,495 | 301,003 | 272,451 | 65,883 | 64,149 | 76,301 | 90,029 | 88,810 | 71,221 | 69,988 | 63,249 |
| 4 Netherlands | 44,236 | 62,278 | 57,051 | 16,166 | 14,835 | 20,087 | 27,414 | 31,705 | 24,162 | 24,668 | 27,493 |
| 5 Germany | 120,056 | 134,224 | 133,435 | 30,669 | 29,848 | 37,015 | 38,178 | 43,101 | 34,570 | 32,179 | 30,403 |
| 6 Hong Kong | 77,351 | 91,356 | 103,762 | 26,025 | 27,916 | 35,667 | 43,334 | 44,457 | 36,325 | 35,887 | 30,131 |
| 7 China | 58,236 | 93,055 | 96,872 | 25,762 | 26,084 | 33,979 | 39,138 | 42,301 | 33,240 | 35,218 | 36,901 |
| 8 United Kingdom | 62,794 | 76,701 | 86,901 | 20,563 | 21,141 | 27,243 | 37,173 | 37,169 | 26,126 | 29,547 | 25,237 |
| 9 Malaysia | 93,998 | 119,305 | 142,451 | 35,936 | 41,963 | 42,111 | 49,248 | 44,376 | 41,574 | 39,543 | 38,051 |
| | 1,706,925 | 2,115,365 | 2,131,327 | 529,637 | 526,075 | 631,067 | 741,777 | 761,976 | 612,628 | 635,555 | 586,720 |

Source: the monthly economic report of the Bank of Thailand in July 2001

Table A.5. Consumer Price Index from 1994 -June 2001.

| | CPI by countries BASE 1995 | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|----|-------------------------------|--------|---------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | United States | 97.30 | 100.00 | 102.90 | 104.70 | 105.10 | 105.50 | 106.00 | 106.20 | 106.80 | 107.20 | 107.60 |
| 2 | Japan | 100.10 | 100.00 | 100.10 | 100.20 | 102.30 | 102.30 | 102.60 | 102.20 | 102.70 | 102.10 | 103.10 |
| 3 | Singapore | 98.30 | 100.00 | 101.40 | 102.50 | 103.00 | 103.90 | 104.30 | 103.70 | 103.10 | 103.00 | 102.80 |
| 4 | Netherlands | 98.10 | 100.00 | 102.00 | 103.20 | 103.90 | 104.50 | 105.30 | 105.40 | 106.20 | 106.40 | 107.10 |
| 5 | Germany | 98.30 | 100.00 | 101.40 | 102.80 | 102.90 | 103.90 | 103.80 | 104.00 | 104.30 | 104.60 | 104.20 |
| 6 | Hong Kong | 91.70 | 100.00 | 106.30 | 110.00 | 111.90 | 113.40 | 114.80 | 115.50 | 116.90 | 116.60 | 113.90 |
| 7 | China | 85.54 | 100.00 | 108.30 | 120.70 | 115.24 | 108.19 | 102.71 | 120.94 | 114.20 | 106.67 | 101.58 |
| 8 | United Kingdom | 96.70 | 100.00 | 102.40 | 103.90 | 105.30 | 106.30 | 107.10 | 107.50 | 109.50 | 109.80 | 110.30 |
| 9 | Malaysia | 94.98 | 100.00 | 103.56 | 105.66 | 105.82 | 106.32 | 107.36 | 100.57 | 109.48 | 109.82 | 110.33 |
| 10 | Thailand | 94.54 | 100.00 | 105.86 | 108.63 | 109.74 | 122.91 | 115.75 | 118.44 | 121.05 | 122.08 | 121.53 |

Sources: International statistic Report (June 2001) and ODEC

Table A.5. Consumer Price Index from 1994 -June 2001. (Continued)

| | CPI by countries BASE 1995 | 1999 | | | | 2000 | | | | 2001 | |
|----|-------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 | United States | 108.00 | 109.10 | 109.70 | 110.40 | 115.50 | 112.70 | 113.60 | 114.20 | 115.30 | 116.49 |
| 2 | Japan | 102.70 | 102.40 | 102.10 | 105.10 | 101.40 | 101.70 | 101.40 | 101.66 | 101.36 | 101.29 |
| 3 | Singapore | 102.90 | 103.10 | 103.30 | 103.30 | 104.10 | 104.00 | 104.90 | 105.38 | 105.87 | 105.70 |
| 4 | Netherlands | 107.70 | 108.60 | 108.90 | 109.40 | 109.80 | 111.20 | 111.80 | 112.70 | 114.63 | 116.43 |
| 5 | Germany | 104.30 | 104.80 | 105.30 | 105.20 | 106.10 | 106.50 | 107.40 | 107.70 | 108.80 | 109.87 |
| 6 | Hong Kong | 113.40 | 112.20 | 109.70 | 109.30 | 107.60 | 107.20 | 106.60 | 106.86 | 105.45 | 105.91 |
| 7 | China | 108.86 | 108.16 | 109.79 | 110.36 | 111.36 | 111.36 | 111.38 | 112.29 | 112.10 | 113.10 |
| 8 | United Kingdom | 109.80 | 111.00 | 111.10 | 111.90 | 112.40 | 114.50 | 114.70 | 115.40 | 115.23 | 117.10 |
| 9 | Malaysia | 114.50 | 114.80 | 114.90 | 115.40 | 116.30 | 116.40 | 116.60 | 117.29 | 117.52 | 118.07 |
| 10 | Thailand | 121.57 | 119.60 | 121.77 | 122.15 | 121.11 | 121.49 | 120.36 | 121.21 | 124.31 | 124.61 |

Sources: International statistic Report (June 2001) and ODEC.

Table A.6. Consumer Price Index from 1994 -June 2001(Base 1999- Quarter4).

| CPI by countries | | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|---------------------------|----------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Base1999- Quarter4 | | | | | | | | | | | | |
| 1 | United States | 88.13 | 90.58 | 93.21 | 94.84 | 95.20 | 95.56 | 96.01 | 96.20 | 96.74 | 97.10 | 97.46 |
| 2 | Japan | 95.24 | 95.15 | 95.24 | 95.34 | 97.34 | 97.34 | 97.62 | 97.24 | 97.72 | 97.15 | 98.10 |
| 3 | Singapore | 95.16 | 96.81 | 98.16 | 99.23 | 99.71 | 100.58 | 100.97 | 100.39 | 99.81 | 99.71 | 99.52 |
| 4 | Netherlands | 89.67 | 91.41 | 93.24 | 94.33 | 94.97 | 95.52 | 96.25 | 96.34 | 97.07 | 97.26 | 97.90 |
| 5 | Germany | 93.44 | 95.06 | 96.39 | 97.72 | 97.81 | 98.76 | 98.67 | 98.86 | 99.14 | 99.43 | 99.05 |
| 6 | Hong Kong | 83.90 | 91.49 | 97.26 | 100.64 | 102.38 | 103.75 | 105.03 | 105.67 | 106.95 | 106.68 | 104.21 |
| 7 | China | 77.51 | 90.61 | 98.13 | 109.37 | 104.43 | 98.03 | 93.07 | 109.59 | 103.48 | 96.66 | 92.05 |
| 8 | United Kingdom | 86.42 | 89.37 | 91.51 | 92.85 | 94.10 | 95.00 | 95.71 | 96.07 | 97.86 | 98.12 | 98.57 |
| 9 | Malaysia | 82.31 | 86.66 | 89.74 | 91.56 | 91.70 | 92.13 | 93.03 | 101.35 | 94.87 | 95.16 | 95.61 |
| 10 | Thailand | 77.40 | 81.87 | 86.66 | 88.93 | 89.84 | 100.62 | 94.76 | 96.96 | 99.10 | 99.94 | 99.49 |

Sources: International statistic Report (June 2001) and ODEC.

Table A.6. Consumer Price Index from 1994 -June 2001(Base 1999- Quarter4. Continued)

| CPI by countries | | 1999 | | | | 2000 | | | | 2001 | |
|---------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| Base1999- Quarter4 | | | | | | | | | | | |
| 1 | United States | 97.83 | 98.82 | 99.37 | 100.00 | 104.62 | 102.08 | 102.90 | 103.44 | 104.44 | 105.52 |
| 2 | Japan | 97.72 | 97.43 | 97.15 | 100.00 | 96.48 | 96.76 | 96.48 | 96.73 | 96.44 | 96.38 |
| 3 | Singapore | 99.61 | 99.81 | 100.00 | 100.00 | 100.77 | 100.68 | 101.55 | 102.01 | 102.49 | 102.32 |
| 4 | Netherlands | 98.45 | 99.27 | 99.54 | 100.00 | 100.37 | 101.65 | 102.19 | 103.02 | 104.78 | 106.43 |
| 5 | Germany | 99.14 | 99.62 | 100.10 | 100.00 | 100.86 | 101.24 | 102.09 | 102.38 | 103.42 | 104.44 |
| 6 | Hong Kong | 103.75 | 102.65 | 100.37 | 100.00 | 98.44 | 98.08 | 97.53 | 97.77 | 96.48 | 96.90 |
| 7 | China | 98.64 | 98.01 | 99.48 | 100.00 | 100.91 | 100.91 | 100.92 | 101.75 | 101.58 | 102.48 |
| 8 | United Kingdom | 98.12 | 99.20 | 99.29 | 100.00 | 100.45 | 102.32 | 102.50 | 103.13 | 102.98 | 104.65 |
| 9 | Malaysia | 99.22 | 99.48 | 99.57 | 100.00 | 100.78 | 100.87 | 101.04 | 101.72 | 101.84 | 102.32 |
| 10 | Thailand | 99.53 | 97.91 | 99.69 | 100.00 | 99.15 | 99.46 | 98.53 | 99.23 | 101.77 | 102.01 |

Sources: International statistic Report (June 2001) and ODEC

Table A.7. Total Weighted of Export Trade.

| Trade by Country (1: Million Baht) | | 1994 | | 1995 | | 1996 | | 1997 | | | | |
|---------------------------------------|----------------|---------|-----------|---------|-----------|---------|-----------|---------|---------|---------|---------|---------|
| | | 1994 | Wim/ 1994 | 1995 | Wim/ 1995 | 1996 | Wim/ 1996 | Q1 | Wim/ Q1 | Q2 | Wim/ Q2 | Q3 |
| 1 | United States | 239,100 | 29.71% | 250,685 | 26.04% | 253,800 | 26.01% | 80,831 | 26.25% | 69,574 | 28.00% | 82,274 |
| 2 | Japan | 194,276 | 24.14% | 236,099 | 24.53% | 237,523 | 24.34% | 72,165 | 23.43% | 55,877 | 22.49% | 59,272 |
| 3 | Singapore | 155,050 | 19.26% | 197,321 | 20.50% | 171,042 | 17.53% | 52,217 | 16.96% | 42,722 | 17.19% | 41,826 |
| 4 | Netherlands | 31,628 | 3.93% | 44,881 | 4.66% | 45,384 | 4.65% | 14,294 | 4.64% | 10,747 | 4.33% | 10,667 |
| 5 | Germany | 40,032 | 4.97% | 40,816 | 4.24% | 40,827 | 4.18% | 10,726 | 3.48% | 9,493 | 3.82% | 9,496 |
| 6 | Hong Kong | 59,990 | 7.45% | 72,777 | 7.56% | 82,121 | 8.42% | 27,942 | 9.07% | 21,878 | 8.80% | 21,926 |
| 7 | China | 23,336 | 2.90% | 40,868 | 4.25% | 47,371 | 4.86% | 14,794 | 4.80% | 9,843 | 3.96% | 10,868 |
| 8 | United Kingdom | 33,818 | 4.20% | 40,338 | 4.19% | 46,561 | 4.77% | 15,537 | 5.05% | 10,551 | 4.25% | 12,625 |
| 9 | Malaysia | 27,631 | 3.43% | 38,724 | 4.02% | 51,071 | 5.23% | 19,439 | 6.31% | 17,796 | 7.16% | 15,821 |
| | | 804,861 | 100.00% | 962,509 | 100.00% | 975,700 | 100.00% | 307,945 | 100.00% | 248,481 | 100.00% | 264,775 |

Table A.7. Total Weighted of Export Trade. (Continued)

| Trade by Country | | 1997 | | | | 1998 | | | | | | | |
|-------------------|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
| | | Wim/ Q3 | Q4 | Wim/ Q4 | Q1 | Wim/ Q1 | Q2 | Wim/ Q2 | Q3 | Wim/ Q3 | Q4 | Wim/ Q4 | |
| (1: Million Baht) | | | | | | | | | | | | | |
| 1 | United States | 31.07% | 121,873 | 29.59% | 134,027 | 30.85% | 115,362 | 32.95% | 136,419 | 36.14% | 114,980 | 33.33% | |
| 2 | Japan | 22.39% | 83,451 | 20.26% | 91,453 | 21.05% | 70,811 | 20.23% | 75,114 | 19.90% | 71,037 | 20.59% | |
| 3 | Singapore | 15.80% | 62,681 | 15.22% | 58,355 | 13.43% | 47,744 | 13.64% | 46,742 | 12.38% | 41,646 | 12.07% | |
| 4 | Netherlands | 4.03% | 20,816 | 5.05% | 26,403 | 6.08% | 19,851 | 5.67% | 19,703 | 5.22% | 23,651 | 6.86% | |
| 5 | Germany | 3.59% | 14,925 | 3.62% | 17,679 | 4.07% | 15,647 | 4.47% | 15,652 | 4.15% | 15,019 | 4.35% | |
| 6 | Hong Kong | 8.28% | 35,792 | 8.69% | 35,487 | 8.17% | 27,786 | 7.94% | 27,847 | 7.38% | 24,067 | 6.98% | |
| 7 | China | 4.10% | 19,992 | 4.85% | 22,684 | 5.22% | 15,092 | 4.31% | 16,665 | 4.41% | 18,413 | 5.34% | |
| 8 | United Kingdom | 4.77% | 27,728 | 6.73% | 27,785 | 6.39% | 18,869 | 5.39% | 22,578 | 5.98% | 19,221 | 5.57% | |
| 9 | Malaysia | 5.98% | 24,623 | 5.98% | 20,644 | 4.75% | 18,900 | 5.40% | 16,802 | 4.45% | 16,901 | 4.90% | |
| | | 100.00% | 411,881 | 100.00% | 434,517 | 100.00% | 350,062 | 100.00% | 377,522 | 100.00% | 344,935 | 100.00% | |

Table A.7. Total Weighted of Export Trade. (Continued)

| Trade by Country | | 1999 | | | | | | | | 2000 | |
|-------------------|----------------|---------|---------|---------|---------|---------|---------|------------|---------|---------|---------|
| (1: Million Baht) | | Q1 | Wim/ Q1 | Q2 | Wim/ Q2 | Q3 | Wim/ Q3 | Q4 | Wim/ Q4 | Q1 | Wim/ Q1 |
| 1 | United States | 97,813 | 30.76% | 114,847 | 33.40% | 129,522 | 34.24% | 137,179.00 | 32.40% | 123,533 | 30.43% |
| 2 | Japan | 72,265 | 22.73% | 70,153 | 20.40% | 77,705 | 20.54% | 91,720.00 | 21.66% | 95,784 | 23.59% |
| 3 | Singapore | 39,479 | 12.42% | 46,517 | 13.53% | 48,469 | 12.81% | 56,562.00 | 13.36% | 51,921 | 12.79% |
| 4 | Netherlands | 20,893 | 6.57% | 18,459 | 5.37% | 20,956 | 5.54% | 22,837.00 | 5.39% | 20,485 | 5.05% |
| 5 | Germany | 13,108 | 4.12% | 13,233 | 3.85% | 13,452 | 3.56% | 15,406.00 | 3.64% | 14,918 | 3.67% |
| 6 | Hong Kong | 25,203 | 7.93% | 27,454 | 7.99% | 29,366 | 7.76% | 30,555.00 | 7.22% | 29,685 | 7.31% |
| 7 | China | 15,141 | 4.76% | 15,262 | 4.44% | 18,186 | 4.81% | 21,980.00 | 5.19% | 26,452 | 6.52% |
| 8 | United Kingdom | 16,652 | 5.24% | 18,627 | 5.42% | 20,416 | 5.40% | 23,501.00 | 5.55% | 19,687 | 4.85% |
| 9 | Malaysia | 17,393 | 5.47% | 19,252 | 5.60% | 20,162 | 5.33% | 23,653.00 | 5.59% | 23,546 | 5.80% |
| | | 317,947 | 100.00% | 343,804 | 100.00% | 378,234 | 100.00% | 423,393.00 | 100.00% | 406,011 | 100.00% |

Table A.7. Total Weighted of Export Trade. (Continued)

| Trade by Country (1: Million Baht) | | 2000 | | | | | | 2001 | | | |
|--|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | Q2 | Wim/ Q2 | Q3 | Wim/ Q3 | Q4 | Wim/ Q4 | Q1 | Wim/ Q1 | Q2 | Wim/ Q2 |
| 1 | United States | 132,615 | 32.34% | 168,363 | 33.46% | 167,310 | 30.79% | 139,583 | 29.66% | 144,098 | 30.18% |
| 2 | Japan | 93,018 | 22.68% | 104,127 | 20.70% | 117,750 | 21.67% | 115,547 | 24.55% | 110,286 | 23.10% |
| 3 | Singapore | 51,930 | 12.66% | 64,395 | 12.80% | 73,738 | 13.57% | 53,370 | 11.34% | 59,685 | 12.50% |
| 4 | Netherlands | 18,121 | 4.42% | 24,623 | 4.89% | 27,300 | 5.02% | 25,977 | 5.52% | 22,914 | 4.80% |
| 5 | Germany | 14,877 | 3.63% | 17,526 | 3.48% | 18,605 | 3.42% | 18,809 | 4.00% | 17,580 | 3.68% |
| 6 | Hong Kong | 32,454 | 7.91% | 39,310 | 7.81% | 38,407 | 7.07% | 33,857 | 7.19% | 35,920 | 7.52% |
| 7 | China | 21,937 | 5.35% | 26,809 | 5.33% | 38,084 | 7.01% | 28,960 | 6.15% | 30,761 | 6.44% |
| 8 | United Kingdom | 20,540 | 5.01% | 26,343 | 5.24% | 28,579 | 5.26% | 25,132 | 5.34% | 24,957 | 5.23% |
| 9 | Malaysia | 24,594 | 6.00% | 31,640 | 6.29% | 33,631 | 6.19% | 29,447 | 6.26% | 31,263 | 6.55% |
| | | 410,086 | 100.00% | 503,136 | 100.00% | 543,404 | 100.00% | 470,682 | 100.00% | 477,464 | 100.00% |

Table A.8. Total Weighted of Import Trade.

| Trade by Country (1: Million Baht) | | 1994 | | 1995 | | 1996 | | 1997 | | | |
|---------------------------------------|----------------|---------|-----------|-----------|-----------|-----------|-----------|---------|---------|---------|---------|
| | | 1994 | Wim/ 1994 | 1995 | Wim/ 1995 | 1996 | Wim/ 1996 | Q1 | Wim/ Q1 | Q2 | Wim/ Q2 |
| 1 | United States | 162,063 | 17.97% | 211,948 | 18.38% | 228,974 | 19.76% | 76,516 | 22.91% | 54,873 | 20.52% |
| 2 | Japan | 413,321 | 45.82% | 538,711 | 46.73% | 518,107 | 44.70% | 137,952 | 41.30% | 112,778 | 42.18% |
| 3 | Singapore | 86,445 | 9.58% | 103,684 | 8.99% | 101,409 | 8.75% | 27,452 | 8.22% | 21,162 | 7.91% |
| 4 | Netherlands | 12,608 | 1.40% | 17,396 | 1.51% | 15,097 | 1.30% | 5,003 | 1.50% | 4,068 | 1.52% |
| 5 | Germany | 80,026 | 8.87% | 93,407 | 8.10% | 92,608 | 7.99% | 28,323 | 8.48% | 21,082 | 7.88% |
| 6 | Hong Kong | 17,362 | 1.92% | 18,581 | 1.61% | 21,641 | 1.87% | 6,271 | 1.88% | 5,970 | 2.23% |
| 7 | China | 34,897 | 3.87% | 52,187 | 4.53% | 49,501 | 4.27% | 17,528 | 5.25% | 16,215 | 6.06% |
| 8 | United Kingdom | 28,976 | 3.21% | 36,363 | 3.15% | 40,340 | 3.48% | 12,016 | 3.60% | 9,293 | 3.48% |
| 9 | Malaysia | 66,364 | 7.36% | 80,582 | 6.99% | 91,380 | 7.88% | 22,979 | 6.88% | 21,955 | 8.21% |
| | | 902,062 | 100.00% | 1,152,859 | 100.00% | 1,159,057 | 100.00% | 334,040 | 100.00% | 267,396 | 100.00% |

Table A.8. Total Weighted of Import Trade. (Continued)

| Trade by Country | | 1997 | | | | | 1998 | | | | |
|------------------|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | Q3 | Wim/ Q3 | Q4 | Wim/ Q4 | Q1 | Wim/ Q1 | Q2 | Wim/ Q2 | Q3 | Wim/ Q3 |
| 1 | United States | 53,865 | 20.89% | 82,049 | 24.87% | 79,781 | 24.36% | 57,214 | 21.79% | 56,163 | 22.13% |
| 2 | Japan | 106,800 | 41.42% | 129,890 | 39.37% | 124,796 | 38.11% | 102,023 | 38.86% | 96,615 | 38.06% |
| 3 | Singapore | 20,954 | 8.13% | 27,348 | 8.29% | 30,455 | 9.30% | 23,477 | 8.94% | 23,246 | 9.16% |
| 4 | Netherlands | 4,685 | 1.82% | 6,598 | 2.00% | 5,302 | 1.62% | 4,311 | 1.64% | 4,965 | 1.96% |
| 5 | Germany | 18,413 | 7.14% | 23,253 | 7.05% | 25,422 | 7.76% | 18,923 | 7.21% | 16,527 | 6.51% |
| 6 | Hong Kong | 5,621 | 2.18% | 7,542 | 2.29% | 8,970 | 2.74% | 8,539 | 3.25% | 8,040 | 3.17% |
| 7 | China | 16,577 | 6.43% | 19,146 | 5.80% | 19,617 | 5.99% | 18,148 | 6.91% | 18,553 | 7.31% |
| 8 | United Kingdom | 8,924 | 3.46% | 9,445 | 2.86% | 9,384 | 2.87% | 7,257 | 2.76% | 6,969 | 2.75% |
| 9 | Malaysia | 22,020 | 8.54% | 24,625 | 7.46% | 23,732 | 7.25% | 22,674 | 8.64% | 22,741 | 8.96% |
| | | 257,859 | 100.00% | 329,896 | 100.00% | 327,459 | 100.00% | 262,566 | 100.00% | 253,819 | 100.00% |

Table A.8. Total Weighted of Import Trade. (Continued)

| Trade by Country (1: Million Baht) | | 1998 | | | | 1999 | | | | | | | | 2000 | |
|---------------------------------------|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|---------|----|
| | | Q4 | Wim/ Q4 | Q1 | Wim/ Q1 | Q2 | Wim/ Q2 | Q3 | Wim/ Q3 | Q4 | Wim/ Q4 | | | Q1 | Q4 |
| 1 | United States | 56,589 | 23.40% | 65,749 | 25.96% | 56,814 | 21.54% | 54,625 | 19.14% | 66,275 | 19.34% | | | 59,730 | |
| 2 | Japan | 92,649 | 38.32% | 97,343 | 38.44% | 107,595 | 40.78% | 116,215 | 40.72% | 143,275 | 41.80% | | | 129,027 | |
| 3 | Singapore | 21,603 | 8.93% | 21,883 | 8.64% | 26,645 | 10.10% | 29,849 | 10.46% | 34,661 | 10.11% | | | 53,715 | |
| 4 | Netherlands | 3,842 | 1.59% | 4,487 | 1.77% | 4,251 | 1.61% | 5,561 | 1.95% | 5,606 | 1.64% | | | 7,388 | |
| 5 | Germany | 15,384 | 6.36% | 14,176 | 5.60% | 13,548 | 5.14% | 15,092 | 5.29% | 17,351 | 5.06% | | | 15,143 | |
| 6 | Hong Kong | 6,064 | 2.51% | 5,621 | 2.22% | 6,130 | 2.32% | 7,225 | 2.53% | 7,744 | 2.26% | | | 22,696 | |
| 7 | China | 18,488 | 7.65% | 18,047 | 7.13% | 21,131 | 8.01% | 25,705 | 9.01% | 29,712 | 8.67% | | | 15,329 | |
| 8 | United Kingdom | 6,016 | 2.49% | 6,016 | 2.38% | 6,160 | 2.33% | 6,838 | 2.40% | 8,648 | 2.52% | | | 7,265 | |
| 9 | Malaysia | 21,150 | 8.75% | 19,934 | 7.87% | 21,544 | 8.17% | 24,263 | 8.50% | 29,480 | 8.60% | | | 27,006 | |
| | | 241,785 | 100.00% | 253,256 | 100.00% | 263,818 | 100.00% | 285,373 | 100.00% | 342,752 | 100.00% | | | 337,299 | |

Table A.8. Total Weighted of Import Trade. (Continued)

| Trade by Country (1: Million Baht) | | 2000 | | 2000 | | | | | | 2001 | | | |
|--|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | Wim/ Q1 | Q2 | Wim/ Q2 | Q3 | Wim/ Q3 | Q4 | Wim/ Q4 | Q1 | Wim/ Q1 | Q2 | Wim/ Q2 | Q3 |
| 1 | United States | 17.71% | 57,711 | 15.79% | 69,333 | 16.70% | 80,813 | 18.18% | 89,756 | 20.14% | 70,367 | 17.00% | 70,367 |
| 2 | Japan | 38.25% | 140,432 | 38.42% | 158,619 | 38.21% | 165,219 | 37.17% | 153,116 | 34.36% | 147,643 | 35.67% | 147,643 |
| 3 | Singapore | 15.93% | 56,597 | 15.49% | 64,068 | 15.44% | 67,178 | 15.11% | 65,066 | 14.60% | 59,924 | 14.48% | 59,924 |
| 4 | Netherlands | 2.19% | 8,852 | 2.42% | 10,060 | 2.42% | 10,743 | 2.42% | 14,714 | 3.30% | 12,081 | 2.92% | 12,081 |
| 5 | Germany | 4.49% | 15,950 | 4.36% | 18,788 | 4.53% | 20,461 | 4.60% | 24,856 | 5.58% | 26,854 | 6.49% | 26,854 |
| 6 | Hong Kong | 6.73% | 27,113 | 7.42% | 30,945 | 7.46% | 31,420 | 7.07% | 30,484 | 6.84% | 34,043 | 8.22% | 34,043 |
| 7 | China | 4.54% | 19,795 | 5.42% | 16,890 | 4.07% | 18,437 | 4.15% | 18,785 | 4.21% | 20,245 | 4.89% | 20,245 |
| 8 | United Kingdom | 2.15% | 7,693 | 2.10% | 7,863 | 1.89% | 12,807 | 2.88% | 12,456 | 2.79% | 9,151 | 2.21% | 9,151 |
| 9 | Malaysia | 8.01% | 31,346 | 8.58% | 38,512 | 9.28% | 37,474 | 8.43% | 36,445 | 8.18% | 33,655 | 8.13% | 33,655 |
| | | 100.00% | 365,489 | 100.00% | 415,078 | 100.00% | 444,552 | 100.00% | 445,678 | 100.00% | 413,963 | 100.00% | 413,963 |

Table A.9. Total Weighted of Total Trade

| Trade by Country (1: Million Baht) | | 1994 | | 1995 | | 1996 | | 1997 | | | |
|---------------------------------------|----------------|-----------|-----------|-----------|-----------|-----------|-----------|---------|---------|---------|---------|
| | | 1994 | Wim/ 1994 | 1995 | Wim/ 1995 | 1996 | Wim/ 1996 | Q1 | Wim/ Q1 | Q2 | Wim/ Q2 |
| 1 | United States | 401,163 | 23.50% | 462,633 | 21.87% | 482,774 | 22.61% | 157,347 | 24.51% | 124,447 | 24.12% |
| 2 | Japan | 607,597 | 35.60% | 774,810 | 36.63% | 755,630 | 35.40% | 210,117 | 32.73% | 168,655 | 32.69% |
| 3 | Singapore | 241,495 | 14.15% | 301,005 | 14.23% | 272,451 | 12.76% | 79,669 | 12.41% | 63,884 | 12.38% |
| 4 | Netherlands | 44,236 | 2.59% | 62,277 | 2.94% | 60,481 | 2.83% | 19,297 | 3.01% | 14,815 | 2.87% |
| 5 | Germany | 120,058 | 7.03% | 134,223 | 6.35% | 133,435 | 6.25% | 39,049 | 6.08% | 30,575 | 5.93% |
| 6 | Hong Kong | 77,352 | 4.53% | 91,358 | 4.32% | 103,762 | 4.86% | 34,213 | 5.33% | 27,848 | 5.40% |
| 7 | China | 58,233 | 3.41% | 93,055 | 4.40% | 96,872 | 4.54% | 32,322 | 5.03% | 26,058 | 5.05% |
| 8 | United Kingdom | 62,794 | 3.68% | 76,701 | 3.63% | 86,901 | 4.07% | 27,553 | 4.29% | 19,844 | 3.85% |
| 9 | Malaysia | 93,995 | 5.51% | 119,306 | 5.64% | 142,451 | 6.67% | 42,418 | 6.61% | 39,751 | 7.71% |
| | | 1,706,923 | 100.00% | 2,115,368 | 100.00% | 2,134,757 | 100.00% | 641,985 | 100.00% | 515,877 | 100.00% |

Table A.9. Total Weighted of Total Trade. (Continued)

| Trade by Country | | 1997 | | | | 1998 | | | | | | |
|--------------------|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | Q3 | Wim/ Q3 | Q4 | Wim/ Q4 | Q1 | Wim/ Q1 | Q2 | Wim/ Q2 | Q3 | Wim/ Q3 | Q4 |
| (1: Million Baht) | | | | | | | | | | | | |
| 1 | United States | 136,139 | 26.05% | 203,922 | 27.49% | 213,808 | 28.06% | 172,576 | 28.17% | 192,582 | 30.50% | 171,569 |
| 2 | Japan | 166,072 | 31.78% | 213,341 | 28.76% | 216,249 | 28.38% | 172,834 | 28.21% | 171,729 | 27.20% | 163,686 |
| 3 | Singapore | 62,780 | 12.01% | 90,029 | 12.14% | 88,810 | 11.66% | 71,221 | 11.63% | 69,988 | 11.09% | 63,249 |
| 4 | Netherlands | 15,352 | 2.94% | 27,414 | 3.70% | 31,705 | 4.16% | 24,162 | 3.94% | 24,668 | 3.91% | 27,493 |
| 5 | Germany | 27,909 | 5.34% | 38,178 | 5.15% | 43,101 | 5.66% | 34,570 | 5.64% | 32,179 | 5.10% | 30,403 |
| 6 | Hong Kong | 27,547 | 5.27% | 43,334 | 5.84% | 44,457 | 5.83% | 36,325 | 5.93% | 35,887 | 5.68% | 30,131 |
| 7 | China | 27,445 | 5.25% | 39,138 | 5.28% | 42,301 | 5.55% | 33,240 | 5.43% | 35,218 | 5.58% | 36,901 |
| 8 | United Kingdom | 21,549 | 4.12% | 37,173 | 5.01% | 37,169 | 4.88% | 26,126 | 4.26% | 29,547 | 4.68% | 25,237 |
| 9 | Malaysia | 37,841 | 7.24% | 49,248 | 6.64% | 44,376 | 5.82% | 41,574 | 6.79% | 39,543 | 6.26% | 38,051 |
| | | 522,634 | 100.00% | 741,777 | 100.00% | 761,976 | 100.00% | 612,628 | 100.00% | 631,341 | 100.00% | 586,720 |

Table A.9. Total Weighted of Total Trade. (Continued)

| Trade by Country | | 1998 | 1999 | | | | | | | | 2000 | | |
|--------------------|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
| (1: Million Baht) | | Wim/ Q4 | Q1 | Wim/ Q1 | Q2 | Wim/ Q2 | Q3 | Wim/ Q3 | Q4 | Wim/ Q4 | Q1 | Wim/ Q1 | |
| 1 | United States | 29.24% | 163,562 | 28.84% | 171,661 | 28.25% | 184,147 | 27.75% | 203,454 | 26.56% | 183,263 | 24.65% | |
| 2 | Japan | 27.90% | 169,608 | 29.90% | 177,748 | 29.25% | 193,920 | 29.22% | 234,995 | 30.67% | 224,811 | 30.24% | |
| 3 | Singapore | 10.78% | 61,362 | 10.82% | 73,162 | 12.04% | 78,318 | 11.80% | 91,223 | 11.91% | 105,636 | 14.21% | |
| 4 | Netherlands | 4.69% | 25,380 | 4.47% | 22,710 | 3.74% | 26,517 | 4.00% | 28,443 | 3.71% | 27,873 | 3.75% | |
| 5 | Germany | 5.18% | 27,284 | 4.81% | 26,781 | 4.41% | 28,544 | 4.30% | 32,757 | 4.28% | 30,061 | 4.04% | |
| 6 | Hong Kong | 5.14% | 30,824 | 5.43% | 33,584 | 5.53% | 36,591 | 5.51% | 38,299 | 5.00% | 52,381 | 7.05% | |
| 7 | China | 6.29% | 33,188 | 5.85% | 36,393 | 5.99% | 43,891 | 6.61% | 51,692 | 6.75% | 41,781 | 5.62% | |
| 8 | United Kingdom | 4.30% | 22,668 | 4.00% | 24,787 | 4.08% | 27,254 | 4.11% | 32,149 | 4.20% | 26,952 | 3.63% | |
| 9 | Malaysia | 6.49% | 37,327 | 6.58% | 40,796 | 6.71% | 44,425 | 6.69% | 53,133 | 6.94% | 50,552 | 6.80% | |
| | | 100.00% | 571,203 | 100.71% | 607,622 | 100.00% | 663,607 | 100.00% | 766,145 | 100.00% | 743,310 | 100.00% | |

Table A.9. Total Weighted of Total Trade. (Continued)

| Trade by Country | | 2000 | | | | | | 2001 | | | |
|--------------------|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | Q2 | Wim/ Q2 | Q3 | Wim/ Q3 | Q4 | Wim/ Q4 | Q1 | Wim/ Q1 | Q2 | Wim/ Q2 |
| (1: Million Baht) | | | | | | | | | | | |
| 1 | United States | 190,326 | 24.54% | 237,696 | 25.89% | 248,123 | 25.11% | 229,339 | 25.03% | 214,465 | 24.06% |
| 2 | Japan | 233,450 | 30.10% | 262,746 | 28.61% | 282,969 | 28.64% | 268,663 | 29.32% | 257,929 | 28.93% |
| 3 | Singapore | 108,527 | 13.99% | 128,463 | 13.99% | 140,916 | 14.26% | 118,436 | 12.92% | 119,609 | 13.42% |
| 4 | Netherlands | 26,973 | 3.48% | 34,683 | 3.78% | 38,043 | 3.85% | 40,691 | 4.44% | 34,995 | 3.93% |
| 5 | Germany | 30,827 | 3.97% | 36,314 | 3.95% | 39,066 | 3.95% | 43,665 | 4.77% | 44,434 | 4.98% |
| 6 | Hong Kong | 59,567 | 7.68% | 70,255 | 7.65% | 69,827 | 7.07% | 64,341 | 7.02% | 69,963 | 7.85% |
| 7 | China | 41,732 | 5.38% | 43,699 | 4.76% | 56,521 | 5.72% | 47,745 | 5.21% | 51,006 | 5.72% |
| 8 | United Kingdom | 28,233 | 3.64% | 34,206 | 3.73% | 41,386 | 4.19% | 37,588 | 4.10% | 34,108 | 3.83% |
| 9 | Malaysia | 55,940 | 7.21% | 70,152 | 7.64% | 71,105 | 7.20% | 65,892 | 7.19% | 64,918 | 7.28% |
| | | 775,575 | 100.00% | 918,214 | 100.00% | 987,956 | 100.00% | 916,360 | 100.00% | 891,427 | 100.00% |

Table A.10. Exchange Rate Weighted against Export Trade.

FORMULA: $\text{Export Value} \times \text{Buying Exchange Rate}$

| Trade by Country export trade | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 United States | 7.44 | 6.46 | 6.57 | 6.93 | 7.54 | 9.60 | 11.95 | 14.41 | 13.17 | 14.72 | 12.23 |
| 2 Japan | 0.06 | 0.06 | 0.06 | 0.05 | 0.05 | 0.06 | 0.07 | 0.08 | 0.06 | 0.06 | 0.06 |
| 3 Singapore | 3.14 | 3.56 | 3.12 | 3.05 | 3.18 | 3.35 | 3.82 | 3.71 | 3.29 | 2.90 | 2.67 |
| 4 Netherlands | 0.54 | 0.72 | 0.70 | 0.63 | 0.61 | 0.63 | 1.03 | 1.38 | 1.12 | 1.07 | 1.34 |
| 5 Germany | 0.76 | 0.73 | 0.70 | 0.53 | 0.60 | 0.63 | 0.83 | 1.04 | 0.99 | 0.96 | 0.96 |
| 6 Hong Kong | 0.24 | 0.24 | 0.27 | 0.31 | 0.31 | 0.32 | 0.45 | 0.49 | 0.41 | 0.39 | 0.33 |
| 7 China | 0.08 | 0.12 | 0.14 | 0.14 | 0.12 | 0.14 | 0.23 | 0.28 | 0.20 | 0.21 | 0.23 |
| 8 United Kingdom | 1.61 | 1.64 | 1.88 | 2.17 | 1.89 | 2.36 | 4.51 | 4.90 | 3.55 | 4.02 | 3.42 |
| 9 Malaysia | 0.33 | 0.40 | 0.52 | 0.64 | 0.75 | 0.70 | 0.69 | 0.55 | 0.55 | 0.44 | 0.46 |
| Total Amount | 14.20 | 13.94 | 13.95 | 14.46 | 15.06 | 17.79 | 23.57 | 26.85 | 23.35 | 24.75 | 21.69 |

Table A.10. Exchange Rate Weighted against Export Trade. (Continued)

FORMULA: Export Value x Buying Exchange Rate

| Trade by Country export trade | | 1999 | | | | 2000 | | | | 2001 | |
|----------------------------------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 | United States | 11.32 | 12.35 | 13.05 | 12.51 | 11.39 | 12.44 | 13.65 | 13.28 | 12.76 | 13.64 |
| 2 | Japan | 0.07 | 0.06 | 0.07 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 | 0.08 |
| 3 | Singapore | 2.67 | 2.90 | 2.87 | 3.06 | 2.81 | 2.81 | 3.00 | 3.34 | 2.78 | 3.10 |
| 4 | Netherlands | 1.23 | 0.95 | 1.00 | 0.98 | 0.84 | 0.72 | 0.82 | 0.85 | 0.99 | 0.86 |
| 5 | Germany | 0.87 | 0.77 | 0.72 | 0.74 | 0.69 | 0.66 | 0.65 | 0.65 | 0.81 | 0.74 |
| 6 | Hong Kong | 0.38 | 0.38 | 0.38 | 0.36 | 0.35 | 0.39 | 0.41 | 0.39 | 0.40 | 0.43 |
| 7 | China | 0.20 | 0.19 | 0.22 | 0.24 | 0.29 | 0.24 | 0.25 | 0.34 | 0.30 | 0.33 |
| 8 | United Kingdom | 3.14 | 3.21 | 3.28 | 3.49 | 2.91 | 2.94 | 3.14 | 3.27 | 3.34 | 3.35 |
| 9 | Malaysia | 0.52 | 0.53 | 0.52 | 0.55 | 0.56 | 0.60 | 0.67 | 0.70 | 0.70 | 0.77 |
| Total Amount | | 20.39 | 21.34 | 22.11 | 22.01 | 19.92 | 20.89 | 22.67 | 22.92 | 22.15 | 23.30 |

Table A.11. Exchange Rate Weighted against Import Trade.

FORMULA: Import Value x Selling Exchange Rate

| Trade by Country export trade | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|----------------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 United States | 4.53 | 4.59 | 5.02 | 6.10 | 5.57 | 6.52 | 10.17 | 11.55 | 8.83 | 9.13 | 8.69 |
| 2 Japan | 0.11 | 0.12 | 0.10 | 0.09 | 0.09 | 0.11 | 0.13 | 0.14 | 0.12 | 0.11 | 0.12 |
| 3 Singapore | 1.59 | 1.60 | 1.59 | 1.51 | 1.50 | 1.72 | 2.12 | 2.64 | 2.22 | 2.20 | 2.03 |
| 4 Netherlands | 0.19 | 0.24 | 0.20 | 0.21 | 0.22 | 0.29 | 0.41 | 0.38 | 0.33 | 0.41 | 0.32 |
| 5 Germany | 1.38 | 1.42 | 1.35 | 1.31 | 1.26 | 1.27 | 1.64 | 2.03 | 1.63 | 1.53 | 1.42 |
| 6 Hong Kong | 0.06 | 0.05 | 0.06 | 0.06 | 0.08 | 0.09 | 0.12 | 0.17 | 0.17 | 0.17 | 0.12 |
| 7 China | 0.11 | 0.14 | 0.14 | 0.17 | 0.21 | 0.25 | 0.29 | 0.35 | 0.35 | 0.38 | 0.36 |
| 8 United Kingdom | 1.24 | 1.24 | 1.38 | 1.57 | 1.57 | 1.74 | 1.95 | 2.24 | 1.86 | 1.88 | 1.55 |
| 9 Malaysia | 0.71 | 0.70 | 0.80 | 0.71 | 0.88 | 1.01 | 0.88 | 0.86 | 0.92 | 0.92 | 0.87 |
| Total amount | 9.94 | 10.10 | 10.64 | 11.73 | 11.38 | 12.99 | 17.71 | 20.36 | 16.43 | 16.73 | 15.48 |

Table A.11. Exchange Rate Weighted against Import Trade.

FORMULA: Import Value x Selling Exchange Rate

| Trade by Country export trade | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|----------------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 United States | 4.53 | 4.59 | 5.02 | 6.10 | 5.57 | 6.52 | 10.17 | 11.55 | 8.83 | 9.13 | 8.69 |
| 2 Japan | 0.11 | 0.12 | 0.10 | 0.09 | 0.09 | 0.11 | 0.13 | 0.14 | 0.12 | 0.11 | 0.12 |
| 3 Singapore | 1.59 | 1.60 | 1.59 | 1.51 | 1.50 | 1.72 | 2.12 | 2.64 | 2.22 | 2.20 | 2.03 |
| 4 Netherlands | 0.19 | 0.24 | 0.20 | 0.21 | 0.22 | 0.29 | 0.41 | 0.38 | 0.33 | 0.41 | 0.32 |
| 5 Germany | 1.38 | 1.42 | 1.35 | 1.31 | 1.26 | 1.27 | 1.64 | 2.03 | 1.63 | 1.53 | 1.42 |
| 6 Hong Kong | 0.06 | 0.05 | 0.06 | 0.06 | 0.08 | 0.09 | 0.12 | 0.17 | 0.17 | 0.17 | 0.12 |
| 7 China | 0.11 | 0.14 | 0.14 | 0.17 | 0.21 | 0.25 | 0.29 | 0.35 | 0.35 | 0.38 | 0.36 |
| 8 United Kingdom | 1.24 | 1.24 | 1.38 | 1.57 | 1.57 | 1.74 | 1.95 | 2.24 | 1.86 | 1.88 | 1.55 |
| 9 Malaysia | 0.71 | 0.70 | 0.80 | 0.71 | 0.88 | 1.01 | 0.88 | 0.86 | 0.92 | 0.92 | 0.87 |
| Total amount | 9.94 | 10.10 | 10.64 | 11.73 | 11.38 | 12.99 | 17.71 | 20.36 | 16.43 | 16.73 | 15.48 |

Table A.12. Exchange Rate Weighted against Total Trade.

FORMULA: Total Trade Value x Mid Exchange Rate

| Trade by Country | | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|------------------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Total trade | | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | United States | 5.91 | 5.45 | 5.73 | 6.52 | 6.53 | 8.10 | 11.19 | 13.22 | 11.36 | 12.52 | 10.81 |
| 2 | Japan | 0.09 | 0.10 | 0.08 | 0.07 | 0.07 | 0.09 | 0.09 | 0.10 | 0.08 | 0.08 | 0.09 |
| 3 | Singapore | 2.33 | 2.50 | 2.29 | 2.25 | 2.32 | 2.55 | 3.07 | 3.26 | 2.84 | 2.63 | 2.42 |
| 4 | Netherlands | 0.36 | 0.46 | 0.43 | 0.41 | 0.41 | 0.46 | 0.76 | 0.96 | 0.79 | 0.81 | 0.92 |
| 5 | Germany | 1.09 | 1.10 | 1.05 | 0.93 | 0.94 | 0.94 | 1.19 | 1.46 | 1.27 | 1.19 | 1.15 |
| 6 | Hong Kong | 0.15 | 0.14 | 0.16 | 0.18 | 0.19 | 0.21 | 0.31 | 0.35 | 0.31 | 0.30 | 0.24 |
| 7 | China | 0.10 | 0.13 | 0.14 | 0.16 | 0.17 | 0.19 | 0.26 | 0.31 | 0.26 | 0.28 | 0.28 |
| 8 | United Kingdom | 1.42 | 1.42 | 1.61 | 1.86 | 1.73 | 2.05 | 3.38 | 3.77 | 2.84 | 3.17 | 2.66 |
| 9 | Malaysia | 0.53 | 0.56 | 0.67 | 0.68 | 0.82 | 0.85 | 0.77 | 0.68 | 0.71 | 0.63 | 0.63 |
| Total amount | | 11.96 | 11.86 | 12.16 | 13.07 | 13.17 | 15.44 | 21.03 | 24.13 | 20.46 | 21.61 | 19.20 |

Table A.12. Exchange Rate Weighted against Total Trade. (Continued)

FORMULA: Total Trade Value x Mid Exchange Rate

| Trade by Country | | 1999 | | | | 2000 | | | | 2001 | |
|---------------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| Total trade | | | | | | | | | | | |
| 1 | United States | 10.68 | 10.50 | 10.63 | 10.31 | 9.28 | 9.49 | 10.61 | 10.89 | 10.82 | 10.92 |
| 2 | Japan | 0.10 | 0.09 | 0.10 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 |
| 3 | Singapore | 2.35 | 2.61 | 2.67 | 2.76 | 3.15 | 3.14 | 3.30 | 3.54 | 3.19 | 3.36 |
| 4 | Netherlands | 0.84 | 0.67 | 0.73 | 0.68 | 0.63 | 0.57 | 0.64 | 0.66 | 0.80 | 0.71 |
| 5 | Germany | 1.02 | 0.88 | 0.88 | 0.88 | 0.77 | 0.73 | 0.75 | 0.76 | 0.97 | 1.01 |
| 6 | Hong Kong | 0.26 | 0.26 | 0.27 | 0.25 | 0.34 | 0.38 | 0.40 | 0.39 | 0.39 | 0.46 |
| 7 | China | 0.26 | 0.27 | 0.31 | 0.31 | 0.25 | 0.25 | 0.23 | 0.28 | 0.26 | 0.30 |
| 8 | United Kingdom | 2.42 | 2.43 | 2.52 | 2.65 | 2.19 | 2.15 | 2.25 | 2.63 | 2.58 | 2.47 |
| 9 | Malaysia | 0.64 | 0.65 | 0.66 | 0.70 | 0.67 | 0.73 | 0.82 | 0.82 | 0.81 | 0.87 |
| Total amount | | 18.57 | 18.37 | 18.76 | 18.65 | 17.39 | 17.55 | 19.11 | 20.08 | 19.93 | 20.18 |

Table A.13. Consumer Price Index Weighted against Export Trade.

FORMULA: CPI x Weighted Export Trade

| CPI by countries | | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|------------------|----------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base 1995 | | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | United States | 28.90 | 26.04 | 26.77 | 27.48 | 29.43 | 32.78 | 31.36 | 32.76 | 35.20 | 38.74 | 35.87 |
| 2 | Japan | 24.16 | 24.53 | 24.37 | 23.48 | 23.00 | 22.90 | 20.79 | 21.51 | 20.77 | 20.31 | 21.23 |
| 3 | Singapore | 18.94 | 20.50 | 17.78 | 17.38 | 17.71 | 16.41 | 15.87 | 13.93 | 14.06 | 12.75 | 12.41 |
| 4 | Netherlands | 3.85 | 4.66 | 4.74 | 4.79 | 4.49 | 4.21 | 5.32 | 6.40 | 6.02 | 5.55 | 7.34 |
| 5 | Germany | 4.89 | 4.24 | 4.24 | 3.58 | 3.93 | 3.73 | 3.76 | 4.23 | 4.66 | 4.34 | 4.54 |
| 6 | Hong Kong | 6.83 | 7.56 | 8.95 | 9.98 | 9.85 | 9.39 | 9.98 | 9.43 | 9.28 | 8.60 | 7.95 |
| 7 | China | 2.48 | 4.25 | 5.26 | 5.80 | 4.57 | 4.44 | 4.99 | 6.31 | 4.92 | 4.71 | 5.42 |
| 8 | United Kingdom | 4.06 | 4.19 | 4.89 | 5.24 | 4.47 | 5.07 | 7.21 | 6.87 | 5.90 | 6.57 | 6.15 |
| 9 | Malaysia | 3.26 | 4.02 | 5.42 | 6.67 | 7.58 | 6.35 | 6.42 | 4.78 | 5.91 | 4.89 | 5.41 |
| 10 | Thailand | 97.39 | 100.00 | 102.41 | 104.41 | 105.03 | 105.28 | 105.70 | 106.23 | 106.73 | 106.46 | 106.31 |

Table A.13. Consumer Price Index Weighted against Export Trade. (Continued)

FORMULA: CPI x Weighted Export Trade

| CPI by countries | | 1999 | | | | 2000 | | | | 2001 | |
|------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base 1995 | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 | United States | 33.23 | 36.44 | 37.57 | 35.77 | 35.14 | 36.45 | 38.01 | 35.16 | 34.19 | 35.16 |
| 2 | Japan | 23.34 | 20.89 | 20.98 | 22.77 | 23.92 | 23.07 | 20.99 | 22.03 | 24.88 | 23.40 |
| 3 | Singapore | 12.78 | 13.95 | 13.24 | 13.80 | 13.31 | 13.17 | 13.43 | 14.30 | 12.00 | 13.21 |
| 4 | Netherlands | 7.08 | 5.83 | 6.03 | 5.90 | 5.54 | 4.91 | 5.47 | 5.66 | 6.33 | 5.59 |
| 5 | Germany | 4.30 | 4.03 | 3.75 | 3.83 | 3.90 | 3.86 | 3.74 | 3.62 | 4.35 | 4.05 |
| 6 | Hong Kong | 8.99 | 8.96 | 8.52 | 7.89 | 7.87 | 8.48 | 8.33 | 7.55 | 7.59 | 7.97 |
| 7 | China | 5.18 | 4.80 | 5.28 | 5.73 | 7.26 | 5.96 | 5.93 | 7.87 | 6.90 | 7.29 |
| 8 | United Kingdom | 5.75 | 6.01 | 6.00 | 6.21 | 5.45 | 5.73 | 6.01 | 6.04 | 6.15 | 6.12 |
| 9 | Malaysia | 6.26 | 6.43 | 6.12 | 6.45 | 6.74 | 6.98 | 7.33 | 7.26 | 7.35 | 7.73 |
| 10 | Thailand | 106.91 | 107.36 | 107.47 | 108.34 | 109.13 | 108.62 | 109.24 | 109.49 | 109.74 | 110.50 |

Table A.14. Consumer Price Index Weighted against Import Trade.

FORMULA: $\text{CPI} \times \text{Weighted Import Trade}$

| CPI by countries | | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|------------------|----------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base 1995 | | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | United States | 17.48 | 18.38 | 20.33 | 23.98 | 21.57 | 22.04 | 26.36 | 25.87 | 23.27 | 23.72 | 25.00 |
| 2 | Japan | 45.87 | 46.73 | 44.75 | 41.38 | 43.15 | 42.37 | 40.40 | 38.95 | 39.91 | 38.86 | 39.35 |
| 3 | Singapore | 9.42 | 8.99 | 8.87 | 8.42 | 8.15 | 8.44 | 8.65 | 9.64 | 9.22 | 9.43 | 9.21 |
| 4 | Netherlands | 1.37 | 1.51 | 1.33 | 1.55 | 1.58 | 1.90 | 2.11 | 1.71 | 1.74 | 2.08 | 1.69 |
| 5 | Germany | 8.72 | 8.10 | 8.10 | 8.72 | 8.11 | 7.42 | 7.32 | 8.07 | 7.52 | 6.81 | 6.64 |
| 6 | Hong Kong | 1.76 | 1.61 | 1.98 | 2.07 | 2.50 | 2.47 | 2.62 | 3.16 | 3.80 | 3.69 | 2.93 |
| 7 | China | 3.31 | 4.53 | 4.63 | 6.33 | 6.99 | 6.95 | 5.96 | 7.25 | 7.89 | 7.80 | 8.73 |
| 8 | United Kingdom | 3.11 | 3.15 | 3.56 | 3.74 | 3.66 | 3.68 | 3.07 | 3.08 | 3.03 | 3.01 | 2.72 |
| 9 | Malaysia | 6.99 | 6.99 | 8.16 | 7.27 | 8.69 | 9.08 | 8.01 | 7.29 | 9.45 | 9.84 | 9.58 |
| 10 | Thailand | 98.03 | 100.00 | 101.71 | 103.45 | 104.39 | 104.35 | 104.49 | 105.03 | 105.83 | 105.25 | 105.85 |

Table A.14. Consumer Price Index Weighted against Import Trade. (Continued)

FORMULA: CPI x Weighted Import Trade

| CPI by countries | | 1999 | | | | 2000 | | | | 2001 | |
|------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base 1995 | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 | United States | 28.04 | 23.50 | 21.00 | 21.35 | 20.45 | 17.80 | 18.98 | 20.76 | 23.22 | 19.80 |
| 2 | Japan | 39.47 | 41.76 | 41.58 | 43.93 | 38.79 | 39.08 | 38.75 | 37.78 | 34.82 | 36.13 |
| 3 | Singapore | 8.89 | 10.41 | 10.80 | 10.45 | 16.58 | 16.10 | 16.19 | 15.92 | 15.46 | 15.30 |
| 4 | Netherlands | 1.91 | 1.75 | 2.12 | 1.79 | 2.40 | 2.69 | 2.71 | 2.72 | 3.78 | 3.40 |
| 5 | Germany | 5.84 | 5.38 | 5.57 | 5.33 | 4.76 | 4.65 | 4.86 | 4.86 | 6.07 | 7.13 |
| 6 | Hong Kong | 2.52 | 2.61 | 2.78 | 2.47 | 7.24 | 7.95 | 7.95 | 7.55 | 7.21 | 8.71 |
| 7 | China | 7.76 | 8.66 | 9.89 | 9.57 | 5.06 | 6.03 | 4.53 | 4.66 | 4.72 | 5.53 |
| 8 | United Kingdom | 2.61 | 2.59 | 2.66 | 2.82 | 2.42 | 2.41 | 2.17 | 3.31 | 3.22 | 2.59 |
| 9 | Malaysia | 9.01 | 9.37 | 9.77 | 9.93 | 9.31 | 9.98 | 10.82 | 9.89 | 9.61 | 9.60 |
| 10 | Thailand | 106.05 | 106.04 | 106.17 | 107.63 | 107.02 | 106.69 | 106.96 | 107.46 | 108.12 | 108.18 |

Table A.15. Consumer Price Index Weighted against Total Trade.

FORMULA: CPI x Weighted Total Trade

| CPI by countries | | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|------------------|----------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base 1995 | | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | United States | 22.87 | 21.87 | 23.27 | 25.66 | 25.35 | 27.48 | 29.14 | 29.80 | 30.09 | 32.70 | 31.46 |
| 2 | Japan | 35.63 | 36.63 | 35.43 | 32.79 | 33.44 | 32.51 | 29.51 | 29.00 | 28.97 | 27.77 | 28.76 |
| 3 | Singapore | 13.91 | 14.23 | 12.94 | 12.72 | 12.76 | 12.48 | 12.66 | 12.09 | 11.99 | 11.42 | 11.08 |
| 4 | Netherlands | 2.54 | 2.94 | 2.89 | 3.10 | 2.98 | 3.07 | 3.89 | 4.39 | 4.19 | 4.16 | 5.02 |
| 5 | Germany | 6.91 | 6.35 | 6.34 | 6.25 | 6.10 | 5.55 | 5.34 | 5.88 | 5.89 | 5.33 | 5.40 |
| 6 | Hong Kong | 4.16 | 4.32 | 5.17 | 5.86 | 6.04 | 5.98 | 6.71 | 6.74 | 6.93 | 6.63 | 5.85 |
| 7 | China | 2.92 | 4.40 | 4.91 | 6.08 | 5.82 | 5.68 | 5.42 | 6.71 | 6.20 | 5.95 | 6.39 |
| 8 | United Kingdom | 3.56 | 3.63 | 4.17 | 4.46 | 4.05 | 4.38 | 5.37 | 5.24 | 4.67 | 5.14 | 4.74 |
| 9 | Malaysia | 5.23 | 5.64 | 6.91 | 6.98 | 8.15 | 7.70 | 7.13 | 5.86 | 7.43 | 6.88 | 7.16 |
| 10 | Thailand | 97.72 | 100.00 | 102.03 | 103.91 | 104.70 | 104.83 | 105.16 | 105.71 | 106.35 | 105.97 | 105.87 |

Table A.15. Consumer Price Index Weighted against Total Trade. (Continued)

FORMULA: CPI x Weighted Total Trade

| CPI by countries | | 1999 | | | | 2000 | | | | 2001 | |
|------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Base 1995 | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 | United States | 31.15 | 30.82 | 30.44 | 29.32 | 28.48 | 27.66 | 29.41 | 28.68 | 28.86 | 28.03 |
| 2 | Japan | 30.71 | 29.96 | 29.84 | 32.24 | 30.67 | 30.61 | 29.02 | 29.12 | 29.72 | 29.31 |
| 3 | Singapore | 11.13 | 12.41 | 12.19 | 12.30 | 14.79 | 14.55 | 14.68 | 15.03 | 13.68 | 14.18 |
| 4 | Netherlands | 4.82 | 4.06 | 4.35 | 4.06 | 4.12 | 3.87 | 4.22 | 4.34 | 5.09 | 4.57 |
| 5 | Germany | 5.02 | 4.62 | 4.53 | 4.50 | 4.29 | 4.23 | 4.25 | 4.18 | 5.18 | 5.48 |
| 6 | Hong Kong | 6.16 | 6.20 | 6.05 | 5.46 | 7.58 | 8.23 | 8.16 | 7.55 | 7.40 | 8.31 |
| 7 | China | 6.37 | 6.48 | 7.26 | 7.45 | 6.26 | 5.99 | 5.30 | 6.42 | 5.84 | 6.47 |
| 8 | United Kingdom | 4.39 | 4.53 | 4.56 | 4.70 | 4.08 | 4.17 | 4.27 | 4.81 | 4.73 | 4.48 |
| 9 | Malaysia | 7.54 | 7.71 | 7.69 | 8.00 | 7.91 | 8.40 | 8.91 | 8.44 | 8.45 | 8.60 |
| 10 | Thailand | 107.28 | 106.79 | 106.91 | 108.02 | 108.17 | 107.71 | 108.21 | 108.58 | 108.95 | 109.43 |

Table A.16. Consumer Price Index Weighted against Export Trade (Base 1999-Quarter4).

FORMULA: CPI x Weighted Export Trade

| CPI by countries | | 1996 | | | | 1997 | | | | 1998 | | | |
|------------------|----------------|-------|-------|-------|--|-------|-------|-------|-------|-------|-------|-------|-------|
| Base 1999- Q4 | | 1994 | 1995 | 1996 | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | United States | 26.18 | 23.59 | 24.24 | | 24.89 | 26.66 | 29.69 | 28.41 | 29.67 | 31.88 | 35.09 | 32.49 |
| 2 | Japan | 22.99 | 23.34 | 23.19 | | 22.34 | 21.89 | 21.79 | 19.78 | 20.47 | 19.77 | 19.33 | 20.20 |
| 3 | Singapore | 18.33 | 19.85 | 17.21 | | 16.83 | 17.14 | 15.89 | 15.37 | 13.48 | 13.61 | 12.35 | 12.02 |
| 4 | Netherlands | 3.52 | 4.26 | 4.34 | | 4.38 | 4.11 | 3.85 | 4.86 | 5.85 | 5.50 | 5.08 | 6.71 |
| 5 | Germany | 4.65 | 4.03 | 4.03 | | 3.40 | 3.74 | 3.54 | 3.58 | 4.02 | 4.43 | 4.12 | 4.31 |
| 6 | Hong Kong | 6.25 | 6.92 | 8.19 | | 9.13 | 9.01 | 8.59 | 9.13 | 8.63 | 8.49 | 7.87 | 7.27 |
| 7 | China | 2.25 | 4.25 | 5.26 | | 5.80 | 4.57 | 4.44 | 4.99 | 6.31 | 4.92 | 4.71 | 5.42 |
| 8 | United Kingdom | 3.63 | 3.75 | 4.37 | | 4.68 | 4.00 | 4.53 | 6.44 | 6.14 | 5.27 | 5.87 | 5.49 |
| 9 | Malaysia | 2.83 | 3.49 | 4.70 | | 5.78 | 6.57 | 5.51 | 5.56 | 4.81 | 5.12 | 4.24 | 4.68 |
| 10 | Thailand | 90.63 | 93.47 | 95.52 | | 97.24 | 97.67 | 97.83 | 98.11 | 99.40 | 99.00 | 98.64 | 98.60 |

Table A.16. Consumer Price Index Weighted against Export Trade (Base 1999-Quarter4. Continued)

FORMULA: CPI x Weighted Export Trade

| CPI by countries | | 1999 | | | | 2000 | | | | 2001 | |
|------------------|----------------|-------|-------|-------|--------|-------|-------|-------|--------|--------|--------|
| Base 1999- Q4 | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 | United States | 30.10 | 33.01 | 34.03 | 32.40 | 31.83 | 33.01 | 34.43 | 31.85 | 30.97 | 31.84 |
| 2 | Japan | 22.21 | 19.88 | 19.96 | 21.66 | 22.76 | 21.95 | 19.97 | 20.96 | 23.67 | 22.26 |
| 3 | Singapore | 12.37 | 13.50 | 12.81 | 13.36 | 12.89 | 12.75 | 13.00 | 13.84 | 11.62 | 12.79 |
| 4 | Netherlands | 6.47 | 5.33 | 5.52 | 5.39 | 5.06 | 4.49 | 5.00 | 5.18 | 5.78 | 5.11 |
| 5 | Germany | 4.09 | 3.83 | 3.56 | 3.64 | 3.71 | 3.67 | 3.56 | 3.51 | 4.13 | 3.85 |
| 6 | Hong Kong | 8.22 | 8.20 | 7.79 | 7.22 | 7.20 | 7.76 | 7.62 | 6.91 | 6.94 | 7.29 |
| 7 | China | 4.70 | 4.35 | 4.78 | 5.19 | 6.57 | 5.40 | 5.38 | 7.13 | 6.25 | 6.60 |
| 8 | United Kingdom | 5.14 | 5.37 | 5.36 | 5.55 | 4.87 | 5.13 | 5.37 | 5.42 | 5.50 | 5.47 |
| 9 | Malaysia | 5.43 | 5.57 | 5.31 | 5.59 | 5.84 | 6.05 | 6.35 | 6.30 | 6.37 | 6.70 |
| 10 | Thailand | 98.72 | 99.05 | 99.12 | 100.00 | 99.05 | 99.05 | 99.12 | 100.74 | 100.67 | 101.24 |

Table A.17. Consumer Price Index Weighted against Import Trade (Base 1999-Quarter4).

FORMULA CPI x Weighted Import Trade

| CPI by countries Base 1999- Q4 | | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|-----------------------------------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | United States | 15.83 | 16.65 | 18.41 | 21.72 | 19.54 | 19.96 | 23.88 | 23.44 | 21.08 | 21.49 | 22.81 |
| 2 | Japan | 43.64 | 44.46 | 42.57 | 39.37 | 41.05 | 40.31 | 38.44 | 37.06 | 37.97 | 36.98 | 37.59 |
| 3 | Singapore | 9.12 | 8.71 | 8.59 | 8.15 | 7.89 | 8.17 | 8.37 | 9.34 | 8.92 | 9.13 | 8.89 |
| 4 | Netherlands | 1.25 | 1.38 | 1.21 | 1.41 | 1.44 | 1.74 | 1.93 | 1.56 | 1.59 | 1.90 | 1.56 |
| 5 | Germany | 8.29 | 7.70 | 7.70 | 8.29 | 7.71 | 7.05 | 6.95 | 7.67 | 7.15 | 6.47 | 6.30 |
| 6 | Hong Kong | 1.61 | 1.47 | 1.82 | 1.89 | 2.29 | 2.26 | 2.40 | 2.89 | 3.48 | 3.38 | 2.61 |
| 7 | China | 3.00 | 4.53 | 4.63 | 6.33 | 6.99 | 6.95 | 5.96 | 7.25 | 7.89 | 7.80 | 7.77 |
| 8 | United Kingdom | 2.78 | 2.82 | 3.18 | 3.34 | 3.27 | 3.29 | 2.74 | 2.75 | 2.70 | 2.69 | 2.45 |
| 9 | Malaysia | 6.06 | 6.06 | 7.08 | 6.30 | 7.53 | 7.87 | 6.94 | 7.34 | 8.19 | 8.53 | 8.36 |
| 10 | Thailand | 91.58 | 93.78 | 95.19 | 96.81 | 97.71 | 97.61 | 97.61 | 99.30 | 98.98 | 98.37 | 98.35 |

Table A.17. Consumer Price Index Weighted against Import Trade (Base 1999-Quarter4. Continued)

FORMULA CPI x Weighted Import Trade

| CPI by countries | | 1999 | | | | 2000 | | | | 2001 | |
|------------------|----------------|-------|-------|-------|--------|-------|-------|-------|--------|--------|--------|
| Base 1999- Q4 | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 | United States | 25.40 | 21.28 | 19.02 | 19.34 | 18.53 | 16.12 | 17.19 | 18.80 | 21.03 | 17.94 |
| 2 | Japan | 37.56 | 39.74 | 39.56 | 41.80 | 36.91 | 37.18 | 36.87 | 35.95 | 33.13 | 34.37 |
| 3 | Singapore | 8.61 | 10.08 | 10.46 | 10.11 | 16.05 | 15.59 | 15.67 | 15.42 | 14.96 | 14.81 |
| 4 | Netherlands | 1.74 | 1.60 | 1.94 | 1.64 | 2.20 | 2.46 | 2.48 | 2.49 | 3.46 | 3.11 |
| 5 | Germany | 5.55 | 5.12 | 5.29 | 5.06 | 4.53 | 4.42 | 4.62 | 4.71 | 5.77 | 6.78 |
| 6 | Hong Kong | 2.30 | 2.39 | 2.54 | 2.26 | 6.62 | 7.28 | 7.27 | 6.91 | 6.60 | 7.97 |
| 7 | China | 7.03 | 7.85 | 8.96 | 8.67 | 4.59 | 5.47 | 4.11 | 4.22 | 4.28 | 5.01 |
| 8 | United Kingdom | 2.33 | 2.32 | 2.38 | 2.52 | 2.16 | 2.15 | 1.94 | 2.97 | 2.88 | 2.31 |
| 9 | Malaysia | 7.81 | 8.12 | 8.47 | 8.60 | 8.07 | 8.65 | 9.37 | 8.57 | 8.33 | 8.32 |
| 10 | Thailand | 98.33 | 98.49 | 98.62 | 100.00 | 99.65 | 99.31 | 99.52 | 100.05 | 100.44 | 100.61 |

Table A.18. Consumer Price Index Weighted against Total Trade (Base 1999-Quarter4).

FORMULA: CPI x Weighted Total Trade

| CPI by countries Base 1999- Q4 | | 1994 | 1995 | 1996 | 1997 | | | | 1998 | | | |
|-----------------------------------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | United States | 20.71 | 19.81 | 21.08 | 23.24 | 22.97 | 24.89 | 26.40 | 26.99 | 27.25 | 29.62 | 28.50 |
| 2 | Japan | 33.90 | 34.85 | 33.71 | 31.20 | 31.82 | 30.93 | 28.08 | 27.60 | 27.57 | 26.42 | 27.37 |
| 3 | Singapore | 13.46 | 13.77 | 12.53 | 12.31 | 12.35 | 12.08 | 12.25 | 11.70 | 11.60 | 11.05 | 10.73 |
| 4 | Netherlands | 2.32 | 2.69 | 2.64 | 2.84 | 2.73 | 2.81 | 3.56 | 4.01 | 3.83 | 3.80 | 4.59 |
| 5 | Germany | 6.57 | 6.03 | 6.02 | 5.94 | 5.80 | 5.27 | 5.08 | 5.59 | 5.59 | 5.07 | 5.13 |
| 6 | Hong Kong | 3.80 | 3.95 | 4.73 | 5.36 | 5.53 | 5.47 | 6.14 | 6.17 | 6.34 | 6.06 | 5.35 |
| 7 | China | 2.64 | 4.40 | 4.91 | 6.08 | 5.82 | 5.68 | 5.42 | 6.71 | 6.20 | 5.95 | 6.39 |
| 8 | United Kingdom | 3.18 | 3.24 | 3.73 | 3.99 | 3.62 | 3.92 | 4.80 | 4.69 | 4.17 | 4.59 | 4.24 |
| 9 | Malaysia | 4.53 | 4.89 | 5.99 | 6.05 | 7.07 | 6.67 | 6.18 | 5.90 | 6.44 | 5.96 | 6.20 |
| 10 | Thailand | 91.13 | 93.64 | 95.34 | 97.02 | 97.69 | 97.72 | 97.89 | 99.36 | 98.99 | 98.53 | 98.50 |

Table A.18. Consumer Price Index Weighted against Total Trade (Base 1999-Quarter4. Continued)

FORMULA: CPI x Weighted Total Trade

| CPI by countries | | 1999 | | | | 2000 | | | | 2001 | |
|------------------|----------------|-------|-------|-------|--------|--------|-------|--------|--------|--------|--------|
| Base 1999- Q4 | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| 1 | United States | 28.21 | 27.92 | 27.57 | 26.56 | 25.79 | 25.05 | 26.64 | 25.98 | 26.14 | 25.39 |
| 2 | Japan | 29.22 | 28.50 | 28.39 | 30.67 | 29.18 | 29.13 | 27.61 | 27.70 | 28.27 | 27.89 |
| 3 | Singapore | 10.78 | 12.02 | 11.80 | 11.91 | 14.32 | 14.09 | 14.21 | 14.55 | 13.25 | 13.73 |
| 4 | Netherlands | 4.41 | 3.71 | 3.98 | 3.71 | 3.76 | 3.54 | 3.86 | 3.97 | 4.65 | 4.18 |
| 5 | Germany | 4.77 | 4.39 | 4.31 | 4.28 | 4.08 | 4.02 | 4.04 | 4.05 | 4.93 | 5.21 |
| 6 | Hong Kong | 5.64 | 5.67 | 5.53 | 5.00 | 6.94 | 7.53 | 7.46 | 6.91 | 6.77 | 7.61 |
| 7 | China | 5.77 | 5.87 | 6.58 | 6.75 | 5.67 | 5.43 | 4.80 | 5.82 | 5.29 | 5.86 |
| 8 | United Kingdom | 3.92 | 4.05 | 4.08 | 4.20 | 3.64 | 3.72 | 3.82 | 4.32 | 4.22 | 4.00 |
| 9 | Malaysia | 6.53 | 6.68 | 6.67 | 6.94 | 6.85 | 7.28 | 7.72 | 7.32 | 7.32 | 7.45 |
| 10 | Thailand | 99.25 | 98.81 | 98.90 | 100.00 | 100.24 | 99.79 | 100.15 | 100.62 | 100.85 | 101.31 |

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