

## CHAPTER 1

### DETERMINANTS OF ASIAN CAPITAL FLIGHT AND THE IMPACT OF 1997 ECONOMIC CRISIS

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This paper investigates the capital flight from five Asian countries, namely Thailand, the Philippines, Indonesia, Malaysia and South Korea, severely affected by the 1997 economic crisis. The evidence indicates, either by direct or indirect measurement of capital flight, that there is a relatively large amount of capital flight from these countries during the studies period from 1991 to 2000. Moreover, the 1997 economic crisis posed an extensive impact on the structure of the capital flight. The evidences also indicate that major factors, such as an increase in the domestic inflation rate, a spread between US and local interest rates, over value of local currency, foreign direct investment (FDI), government budget deficits and current account deficits, are important in explaining the capital flight from Asia.

#### **1. Introduction**

It is common for the open economy that its people participate in financial and economic transactions, including external financial claims with the people of other countries. Generally, local people would like to own foreign assets in order to maintain their purchasing power when the local currency expects to be depreciated or when there is a rapid increase in domestic inflation rates. Instability of domestic political situation also stimulates people to move their assets to safer places in foreign countries.

Yet, there are debates whether the acquisition of foreign assets should be regarded as “capital flight” or “normal capital outflows”.

Cumby and Levich (1987) propose legitimacy as a tool to differentiate between capital flight and normal capital outflows. That is, any illegal movement of capital should be regarded as the capital flight while the legal one should be regarded as normal outflows of capital. In addition, nationalists’ social utility concept shows that capital flight is a source of disutility as it causes a decrease in domestic social welfare, though augmenting private welfare of those who move the capital out of the country. Cuddington (1986) gives supporting ideas of social disutility from capital flight as causes of instability in domestic financial markets, increase in cost of foreign borrowings due to capital shortage in the country and loss of income taxes.

The above reasons show that capital flight can pose severe impacts on the country’s economic development. This is especially true for Asian countries facing economic crisis in 1997. So far, there is no research on the capital flight that caused a huge impact on those Asian countries. Therefore, it is interesting and necessary to conduct an in depth study on this topic. This research aims to 1) gather figures of capital flight from severely affected countries from the 1997 Asian Economic Crisis, including Thailand, the Philippines, Indonesia, Malaysia and South Korea, by using the widely accepted measures of capital flight, and 2) study various factors explaining the determinants of capital flight from those countries. Findings from this study can be of benefits to the introduction of policies and preventive measures to avoid enormous losses on the country’s economy. The rest of this paper is organized as follows. Section II provides definitions of capital flight measurement: Direct and Indirect Measures. Section III describes the data for this study, outcomes of the capital flight from Asia and the impact of 1997 economic crisis. Section IV studies determinants of capital flight from the chosen countries and also empirical findings which can be applied to the policy-making. The last section of this paper provides concluding remarks.

## 2. Capital Flight Measurement

There is a variety of definitions of capital flight which give different figures. Measurement of capital flight is divided into<sup>1</sup>: 1) **Direct Measure**—defining items of capital flight and using direct data from these items to calculate the total of capital flight; 2) **Indirect Measure**—indirectly defining capital flight, e.g. capital flight is the difference between certain items (definitions for indirect measure are generally wider than those of direct measure).

### 2.1. Direct Measures

Direct measures of capital flight use direct data from the balance of payments. It is particularly focused on short-term capital outflows, known as “Hot Money”, which rapidly response to change in the level of investment risk. The hot money, however, also quickly flows back to the country as soon as the risk turns out to be positive. Cuddington (1986) provides that Capital Flight ( $CF_{CU}$ ) refers to the acquisition of short-term foreign assets by the non-banking private sector. From this, capital flight can be measured by having Errors and Omissions (EO), which reflect Unrecorded Short-term Capital Flows, plus Other Short-term Capital, Other Sector (OSC), to be considered according to the respective country.

$$CF_{CU} = EO + OSC \quad (1)$$

According to Kant (1996), there are debates on the direct measures of capital flight. This is due to the fact that investors may possess both short-term and long-term foreign assets while having the same motivations and impacts on the country, long-term capital such as government bonds also have a high degree of liquidity, and, Errors and Omissions may be derived from different sources, not recorded in the balance of payments. This implies that interpretation of Errors and Omissions by Cuddington (1996) is too narrow.

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<sup>1</sup> We do not consider Hybrid Measure in this study due to the limitation of data.

## 2.2. *Indirect Measures*

Indirect measures of capital flight mainly measure Net Foreign Claims by the private sector. It is stated that capital flight is calculated under the assumption that capital inflows will be used as a basis for capital outflows. As a result of this, the residual of both types of capital flows is regarded as the amount of capital flight of the respective country. This implies that indirect measures of capital flight are not focused on the impact of national policy on capital flows and do not differentiate between normal and abnormal flows of capital.

The World Bank (1985) suggests the use of indirect measures provided that the Increase in External Debt (IED) and the Net Foreign Direct Investment (NFDI) show the amount of capital inflows and that the Current Account Deficit (CAD) and the Increase in Official Reserves (IOR) show the amount of capital outflows. Therefore, the difference between Sources of Funds and Uses of Funds refers to the Increase in Net Foreign Claims by the private sector and is regarded as the Capital Flight ( $CF_{WB}$ ):

$$CF_{WB} = IED + NFDI - CAD - IOR \quad (2)$$

Considering the Increase in External Debt (IED), the World Bank does not use data from the balance of payment but from sources of the World Debt Tables in stead. Thus, some believe that the figures of external debt from such source may not be inconsistent with those recorded in the balance of payment. It is believed that the inconsistency may possibly come from the exchange-rate revaluation and debt reclassification reported by the World Bank.

Morgan Guaranty Trust (1986) adjusts the World Bank's measurement of capital flight by omitting Short-term Foreign Assets of the Banking System (SFABS) and only regarding foreign assets of the non-banking private sector as the Capital Flight ( $CF_{MG}$ ):

$$CF_{MG} = CF_{WB} - SFABS \quad (3)$$

Still, Morgan Guaranty Trust (1986) fails to prove how motivations of external claims by firms and individuals differ from external claims by the banking system, whereas it is the main reason for adjusting the definition of capital flight introduced by the World Bank.

Cline (1987) readjusts the capital measurement of Morgan Guaranty Trust by omitting the Reinvested Investment Income (RII) and the Income from Tourism and Border Transaction (ITBT) from the current account before measuring the capital flight. The reason for this is that we should not use incomes from external assets which do not return to the country in the calculation of capital flight and that the ITBT involves transactions in the free market, which is beyond state control. The Capital Flight ( $CF_{CI}$ ), according to Cline (1987), can be measured by:

$$CF_{CI} = CF_{MG} - RII - ITBT \quad (4)$$

In spite of the fact that indirect measure of capital flight is simple, shortcomings are detected from inaccuracy of foreign loans figures and overestimation of capital flight for countries with high level of foreign borrowings that do not experience shortage of domestic reserves. In addition, errors in the capital flight measurement may come from the calculation of external debt merely in the form of US Dollar. This is because some countries may have foreign loans in currencies other than US Dollar, so there exists the change in the exchange rates between US Dollar and other currencies.

### **3. Capital Flight from Asia**

This section presents the empirical results of capital flight by Direct and Indirect measures, details as described in section II. The Asian countries selected for this study are Thailand, the Philippines, Indonesia, Malaysia and South Korea, severely affected by the 1997 Economic Crisis after the depreciation of Thai Baht. From the previous studies, capital flight is usually experienced by those countries facing acute financial crisis. It is, therefore, interesting to find out whether those five countries encountered the problem of capital flight both before and after the 1997 economic crisis.

#### **3.1. Sources of Information**

This study covers ten years period from 1991-2000 divided into 1) the six years period before the eruption of the economic crisis (1991-1996)

and 2) the four years period during and after the crisis (1997-2000). To present the movements of capital flight in this group of countries, the research applies quarterly information from the balance of payments of each country as reported in the International Financial Statistics (IFS) of the International Monetary Fund (IMF). Additional data are obtained from the World Bank's reports, e.g. World Debt Tables, to measure the capital flight. Other economic figures, e.g. foreign exchange rates, inflation rates, interest rates, current account deficits and government budget deficits, are also obtained from the reports of IMF.

### **3.2. Preliminary Analysis of Capital Flight**

Table 1 shows a total stock of capital flight of each country during 1991 to 2000, measured by direct measure of Cuddington (1986) and indirect measure of the World Bank (1985). With the direct measure, it is revealed out that Thailand and South Korea had the highest total stock of capital flight, 25.71 billions USD and 24.67 billions USD, respectively. At the same time, Indonesia had the lowest total stock of capital flight, 8.49 billions USD. In addition, considering the post crisis period, it is revealed that all of the countries, except for Indonesia, had a very high volume of capital flight. Thailand and South Korea had the highest volume, 33.51 billions USD and 18.31 billions USD, respectively. Whereas, studying the period prior to the crisis, Indonesia was the country most affected by the capital flight while South Korea and Malaysia had minus total of capital flight. In other words, the evidence reveals that there were capital inflows to both countries before the 1997 Economic Crisis.

With the indirect measure of the World Bank (1985), it is stated that South Korea and Malaysia had the highest total stock of capital flight of 67.54 billions USD and 103.01 billions USD, respectively; whereas, Thailand had 67.54 billions USD and the Philippines the lowest total of 30.43 billions USD. When considering the before and after the crisis separately, it is found out that, after the crisis, South Korea and Malaysia had the highest total stock of capital flight, 97.84 billions USD and 32.27 billions USD, respectively. At the same time, Indonesia had the lowest total stock of capital flight, 13.50 billions USD. In the period prior to the

Table 1: Total Stock of Capital Flight of each country during 1991 to 2000

Year	Direct Measurement of Cuddington (1986)					Indirect Measurement of World Bank (1985)				
	Thailand	The Philippines	Indonesia	Malaysia	South Korea	Thailand	The Philippines	Indonesia	Malaysia	South Korea
1991-1996	7,396.76 (2.7) <sup>1</sup>	3,358.71 (3.56)	8,358.11 (5.05)	-1,346.00 (-2.82)	-8,831.17 (-2.08)	42,010.78 (31.37)	2,030.24 (5.24)	31,032.10 (19.18)	70,735.90 (93.47)	28,895.49 (5.99)
1997-2000	18,312.21 (14.23) <sup>1</sup>	12,042.42 (15.9)	132.26 (-0.36)	11,956.50 (14.07)	33,505.64 (8.73)	25,532.00 (25.25)	28,403.18 (39.38)	13,498.40 (10.76)	32,271.43 (37.68)	97,844.15 (24.38)
Total	25,708.97 (16.92) <sup>1</sup>	15,401.13 (19.46)	8,490.37 (4.69)	10,610.50 (11.25)	24,674.47 (6.64)	67,542.78 (56.62)	30,433.42 (44.63)	44,530.50 (29.93)	103,007.33 (131.15)	126,739.64 (30.37)

*Remark:* The digits in the parentheses represent in term of percent of Gross Domestic Product (GDP) of each country in the particular periods.

crisis, Malaysia faced the biggest impact of capital flight of 70.74 billions USD, while Thailand had 42.01 billions USD, and the Philippines the lowest of 2.03 billions USD.

### *3.2.1. Impact of 1997 Economic Crisis*

From the measurement of capital flight, both in US Dollar and as a percentage of GDP, shown in the previous section, it can be seen that the volume of capital flight of some countries changed after the 1997 Economic Crisis. This, therefore, brings interesting question whether the crisis had any impact on the structure of the capital flight. In response to the question, the structural change of capital flight was analyzed by the Chow Breakpoint Test. The third quarter of 1997 was defined as a breakpoint, considering it was the time when the Economic Crisis started to spread from Thailand to other countries in Asia. The Chow Test will report the Log Likelihood Ratio and Probability along with the test of hypothesis for structural change of each country. This test will be used for both direct and indirect measures of capital flight.

Table 2 provides the test result of structural change of capital flight in the selected countries. As for Thailand, the Log Likelihood Ratio and Probability shows that the capital flight from Thailand before and after the 1997 Economic Crisis was significantly different. Studying with direct measure of Cuddington (1986), it is significant at the 1% level of significance. Indirect measure of the World Bank is also significant at the 1% level; while Morgan Guaranty (1986) and Cline (1987) are significant at the 5% levels.

For the Philippines, the log likelihood ratio and probability shows that the structure of the Philippines' capital flight before and after the 1997 Crisis were significantly different at the 5% level of significance, as measured by indirect measures of Morgan Guaranty Trust (1986) and Cline (1987).

In Indonesia's case, a study with the direct measure of Cuddington (1986) shows that there was a significant change of capital flight structure before and after the crisis at 1% level of significance. When considering the capital flight of the period before and after the 1997 Crisis with indirect measures of the World Bank (1985), Morgan

Guaranty Trust (1986) and Cline (1987), the Log Likelihood Ratio and Probability shows that the significant differences of Indonesia’s capital flight structures was at the 5%, 10% and 20% levels of significance, respectively.

For Malaysia, the Log Likelihood Ratio and Probability shows that the structural change of capital flight is at 5% level for the direct measure, and 1% level for the indirect measure, when comparing between the period before and after the 1997 Crisis. As Malaysia posed the exchange control, the amount of capital flight was relatively low after the crisis in 1997 comparing the period before the crisis when the stock of capital flight was high. This confirms that there was such a significant change in the structure of capital flight.

Table 2: The Test of Structural Change of Capital Flight in the Selected Countries

Countries	Cuddington	World Bank	Morgan	Cline
Thailand	33.8222 <sup>1</sup> (0.0000) <sup>2*</sup>	19.9962 (0.0056)*	17.4187 (0.0149)**	16.2801 (0.0227)**
The Philippines	8.2453 (0.3115)	10.0267 (0.1871)	15.1777 (0.0338)**	14.7984 (0.0387)**
Indonesia	28.2338 (0.0002)*	13.8924 (0.0531)**	12.0010 (0.1005)***	9.9169 (0.1933)****
Malaysia	15.2634 (0.0328)**	27.8603 (0.0002)*	35.2625 (0.0000)*	37.3332 (0.0000)*
South Korea	23.9941 (0.0011)*	34.6024 (0.0000)*	34.2282 (0.0000)*	32.5335 (0.0000)*

Remarks:

<sup>1</sup> shows Loglikelihood Ratio of Chow Breakpoint test for structural changes of capital flight in each country by using 3<sup>rd</sup> quarter in 2000 as a test point.

<sup>2</sup> shows probability of Loglikelihood Ratio of Chow Breakpoint test for structural changes

\* Significant at the 1% level

\*\* Significant at the 5% level

\*\*\* Significant at the 10% level

\*\*\*\* Significant at the 20% level

For South Korea, the Log Likelihood Ratio and Probability shows that the structures of capital flight in Korea before and after the Economic Crisis were significantly different at 1% level of significance, when studying with direct and indirect measures.

To conclude, the five selected countries, apart from the Philippines, and particularly the case of capital flight measurement of Cuddington (1986) and the World Bank (1985), the result of Chow Breakpoint Test shows that the 1997 Economic Crisis caused structural changes of capital flight from Asian countries, severely affected by the crisis. This is in consistent with Paster's (1990) statement that, in general, the crisis that arises from the depreciation of local currency and the rapid change in investment risk will lead to the significant flight of capital from that particular country.

#### **4. Determinants of Capital Flight**

The finding in previous section reveals that the five Asian countries faced different degrees of capital flight problems. This brings the question of what economic factors lead to the capital flight in each of these countries. This section provides an answer to this question: beginning with the literature review of previous studies on the capital flight in other regions, providing a model for studying the case of selected Asian countries, then presenting the empirical results.

##### **4.1. Literature Review**

The study of capital flight came into attention of international financial economists after the birth of the financial crisis in Latin America in 1980s. The study has since become popular, especially when countries or regions experienced major financial and currency crises. Cuddington (1987) studies the determinants of capital flight in four Latin American countries, which are Mexico, Argentina, Uruguay and Venezuela, facing the most severe problems of capital flight during the economic crisis in Latin America. The sources for his study were from the annual balance of payment reported by the International Monetary Fund (IMF), covering the period of 1974-1984. This annual data, however, was regarded as too

limit (the data can not be appropriately collected on a quarterly basis in this period of time) and might result in the unreliable findings.

The results of Cuddington (1987) show that there are three factors that can explain the capital flight from the four countries, though some of them might have different levels of significance. Firstly, the Exchange Rate Overvaluation, with positive relation, can describe the capital flight from the four selected countries. This implies that the states should impose the macroeconomic policy which does not allow the overvaluation of local currency, as it motivates people to move their capital to other countries with more stable currencies. Secondly, an increase in the interest rates in the United States, with positive relation, can describe the capital flight in Mexico and Venezuela. Thus, the fact that the industrialized countries, specifically the United States, implements proper macroeconomic policy can help lessening the problems of capital flight in the developing countries. Lastly, capital inflows in the form of foreign loans can positively describe the capital flight in Mexico and Uruguay. This means, the capital inflow is the basis for the capital outflow. The states, then, should avoid the capital flight by taking into consideration of how to effectively utilize the foreign loans, for example, an allocation of money to suitable economic sectors.

Paster (1990) studies the capital flight in eight countries in Latin American, including Argentina, Brazil, Chile, Columbia, Mexico, Peru, Uruguay and Venezuela, in the period of 1973-1985. The capital flight then was worth 151 billions USD. Additionally, Paster (1990) found that there are five determinants of capital flight which are significant in the statistical aspect: 1) difference between US Dollar and other currencies; 2) changes in inflation rates; 3) net long-term capital inflow; 4) difference in the economic growth rates of the United States and other countries and 5) an increase in tax rates (per GDP). Furthermore, it is mentioned that the exchange control helped to reduce the capital flight in some countries. However, joining the Stand-by-Credit, an aid programme provided by the IMF, did not affect the capital flight from those countries. In other words, the IMF's financial aid programme did not help reduce the capital flight in this region.

Gibson and Tsakalotos (1993) conduct a research on the capital flight in five countries in Europe, namely France, Italy, Spain, Portugal and

Greece, using quarterly data covering 1976-1987. The reason for choosing France and Italy is that both countries had experience the capital flight in the past. On the other hand, Spain, Portugal and Greece are developing countries that implement the Exchange Control. The three countries are to reject the policy when they join the European Monetary System, and this makes an interesting point of study. Gibson and Tsakalotos (1993) assume that the capital flight is influenced by the following factors: 1) expected exchange rate changes, especially currency depreciation; 2) political uncertainty, focusing on the government policy that will affect the majority of people; and 3) government budget deficits, viewing that the budget deficits will lead to financial difficulties and capital flight. Apart from these three factors, the model also includes domestic and foreign interest rates. It is concluded that the expected devaluation of exchange rate and the political uncertainty have positive impact on the capital flight, except for Italy. The government budget deficits have positive impact on the capital flight in France. In addition, a decrease in interest rates in Spain and Portugal leads to an increase in capital flight in the two countries.

Kant (1996) studies the interrelation between Foreign Direct Investment (FDI) and Capital Flight, with three major questions: 1) whether FDI causes the capital flight in those countries; 2) whether the interrelation between FDI and Capital Flight is influenced by different measures of capital flight; and 3) whether the capital flight results from Investment Climate Perspective or Discriminatory-Treatment Perspective. Kant (1996) uses information of capital flight in developing countries from 1974 to 1992, which was calculated by the World Bank. Contemporaneous-correlation and Principal-component analysis were conducted on three sub-regions of the six continents: East Asia and the Pacific, Latin America and Caribbean, and Europe and Mediterranean. It is concluded that the inflow of FDI will appear once there is a decrease in capital flight. This is either by using direct, indirect or hybrid measures. Besides, it is stated that the capital flight was a consequence of ineffective administration of the government rather than the privileges given to foreign investors.

Loungani and Mauro (2000) analyze the determinants of capital flight in Russia, assuming that there are various sources of capital flight, for

example, instability of macro-economy, unfair taxation, a lack of confidence on financial institutions, extensive corruption, and failure to protect intellectual property rights. For the empirical research, Loungani and Mauro (2000) use not only information from Russia but also the database from the transitional economies (from Communism to Capitalism) in three regions: Central Europe, Baltic Sea and Latin America. The period for this study is from 1994 to 1998. Evidence shows that the high inflation rates, government budget deficits and the high level of economic reform are motivations for the capital flight (this is true for the analysis with all three measures). Moreover, it is revealed that capital control does not have any influence on the capital flight in the select countries.

Antzoulatos and Sampaniotis (2002) conduct a research on determinants of capital flight in 17 countries in Eastern Europe. They use quarterly information from 1993 to 1999 to measure capital flight with five different definitions and the model of seven variables. The findings of this research shows that three variables help describe the capital flight. That is, the appreciation of local currency has negative relation with the capital flight. The increased budget deficits to GDP lead to the increased level of capital flight. It is believed that once there are budget deficits, people will be concerned that the government will raise tax rates to compensate the deficits.

Chantanawan (2000) studies the determinants of capital flight in Thailand by adopting the Portfolio Theory, which compares the return on investment and investment risk of domestic and foreign assets. The return on investment rate is represented by the expected devaluation of Thai Baht while the investment risk is represented by the spread between Thai and US Government bonds. Chantanawan (2000) uses seven different measures of capital flight for the model of the mentioned variables. The period of study is from the third quarter of 1997 to the fourth quarter of 1999. The research result shows that the devaluation of Thai Baht can describe the capital flight with three measures but cannot describe the capital flight with the rest four measures. This may be caused by 1) the limits of quarterly data for the test and 2) the difference in interest rates may not accurately estimate the risk of Thai economy.

## 4.2. Regression Model

The literature review in previous section explains which economic factors caused the capital flight in different regions. Therefore, with evidence from the past studies, this research introduces the model to test the hypothesis of the capital flight from the five Asian countries, as followings:

$$CF_{CUit} = a + b_1 (CHINF)_{it} + b_2 (FINC)_{it} + b_3 (OVAL)_{it} + b_4 (FDI)_{it} + b_5 (GBUD)_{it} + b_6 (CAD)_{it} + b_7 (DUM)_{it} + \varepsilon_{it} \quad (5)$$

$$CF_{WBit} = a + b_1 (CHINF)_{it} + b_2 (FINC)_{it} + b_3 (OVAL)_{it} + b_4 (FDI)_{it} + b_5 (GBUD)_{it} + b_6 (CAD)_{it} + b_7 (DUM)_{it} + \varepsilon_{it} \quad (6)$$

$$CF_{MGit} = a + b_1 (CHINF)_{it} + b_2 (FINC)_{it} + b_3 (OVAL)_{it} + b_4 (FDI)_{it} + b_5 (GBUD)_{it} + b_6 (CAD)_{it} + b_7 (DUM)_{it} + \varepsilon_{it} \quad (7)$$

$$CF_{CLit} = a + b_1 (CHINF)_{it} + b_2 (FINC)_{it} + b_3 (OVAL)_{it} + b_4 (FDI)_{it} + b_5 (GBUD)_{it} + b_6 (CAD)_{it} + b_7 (DUM)_{it} + \varepsilon_{it} \quad (8)$$

where:

$CF_{CU}$  = capital flight according to Cuddington (1986)

$CF_{WB}$  = capital flight according to World Bank (1985)

$CF_{MG}$  = capital flight according to Morgan Guaranty Trust (1986)

$CF_{CL}$  = capital flight according to Cline (1987)

$i$  = 5 countries: Thailand, the Philippines, Indonesia, Malaysia and South Korea

$t$  = 40 quarters; from 1<sup>st</sup> Quarter of 1991 of 4<sup>th</sup> Quarter of 2000

The meaning of the seven variables and the assumption regarding interrelation between the capital flight and each of the variables is shown in Table 3. The OLS Regression will be applied to the above equations. The OLS Regression is suitable for this research as the problem of Heteroskedasticity will not significantly affect the regression results.

Table 3: Determinants for Capital Flight and Direction of Relations

Variables	Relations with Capital flight
1. CHINF (Change in Inflation)	Have positive relations with capital flight as an increase in inflation rates leads to lower level of real return on investment. To avoid this phenomenon, local investors move their capital out of the country and acquire foreign assets in stead. Also, increased inflation rates lead to the expectation that the local currency will soon be depreciated. Note that the Change in Inflation derives from: $CHINF = \ln\pi(t) - \ln\pi(t-1)$ When $\pi$ is domestic inflation rate.
2. FINC (Financial Incentive)	Have positive relations with capital flight since larger spread between US Dollar and local currency leads to higher motivation to acquire foreign assets in the form of US Dollar (capital flight). The Financial Incentive derives from: $FINC = \ln(1+i_{US}) - \ln(1+i) + \ln(e) - \ln(e-1)$ When $i_{US}$ = interest rate of US Treasury bill $i$ = domestic interest rate $e$ = exchange rate between local currency and US Dollar
3. OVAL (Degree of Currency Overvaluation)	Have positive relations with capital flight as over-valued local currency tends to be depreciated and, thus, drives local investors to move their capital to be reserved in the a more stable currency. The Degree of Currency Overvaluation derives from: $OVAL = P / (e * P_{US})$ When $P$ = level of domestic product $P_{US}$ = level of US domestic product $e$ = exchange rate between US Dollar and local currency

Variables	Relations with Capital flight
4. FDI (Foreign Direct Investment)	Have two types of relations with capital flight: 1. Negative relations, if considering that high FDI represents excellent domestic investment climate. This is especially true when considering from the Investment-Climate Perspective. Thus, high level of FDI indicates that there is to be lower volume of capital flight. 2. Positive relations, viewing that increased FDI results from the government's discriminatory policy, which gives privileges to foreign investors over local investors (Discriminatory-Treatment Perspective). This drives investors to move their capital to a country with better investment incentive.
5. GBUD (Government Budget Deficit)	Have positive relations with capital flight because the government budget deficit is a bad sign that may lead to higher tax rate in the future. This possibly leads to capital flight.
6. CAD (Current Account Deficit)	Have positive relations with capital flight. Current account deficit is a sign for economic recession and this could lead to capital flight.
7. DUM (Dummy Variable)	Is a variable that describes structural change due to the 1997 Economic Crisis, defining its value as "0" for data before 3rd quarter of 1997 and as "1" for data collected from 3rd quarter of 1997 on. If DUM is statistically significant, it means that 1997 Economic Crisis has a crucial impact on the capital flight.

The test of four regression equations (5) to (8) is separated into two stages. First, the full equations are tested using all seven variables. The result will show which variables are statistically significant. Then, the second stage examines the reduced equations. That is to use only the variables with statistical significance from the first stage, and put it on the right hand side of the regression equation in the second stage. This is to confirm that the test result of the first stage remain significant at the

second stage. Then, the test result of the regression equations, only variables with statistical significance, is reported in the next section.

### **4.3. Empirical Findings**

Results from the test of four equations to see the determinant factors for capital flight in the five countries are as follows:

#### *Thailand*

Table 4 provides the test result of regression equations of Thailand's case. According to direct measure of Cuddington (1986), two variables can describe the capital flight from Thailand. First, an increase in domestic inflation rates (CHINF) has statistical significance at the 10 percent level but has opposite direction to the assumption. That is, the increased inflation rates lead to decreased capital flight from Thailand. Second, the current account deficits (CAD) have statistical significance at the 5 percent level and have positive relation in accordance with the assumption. That is, the increased CAD leads to increased capital flight from Thailand.

According to the direct measures of capital flight, the variable of residual between interest rates of US Dollar and Thai Baht (FINC) can describe Thailand's capital flight. The statistical significance is at the 5 percent to 10 percent levels. However, the direction is opposite to the assumption. That is, an increase in residual between both currencies leads to a decrease in capital flight from Thailand. The second variable, which is the overvaluation of local currency (OVAL), can describe the capital flight with all of the indirect measures. It is at the 10 percent statistical significance and has positive relation which is consistent with the assumption. That is the overvalued of Thai Baht leads to a higher volume of capital flight.

Next, FDI can describe Thailand's capital flight at the 5 percent statistical significance. Moreover, it has positive relation in accordance with the Discriminatory-Treatment Perspective, meaning that Thai Government discriminately gives privilege to foreign investors rather than local investors. Therefore, FDI happens at the same time as the

capital flight by Thai investors. Furthermore, the CAD can describe Thailand's capital flight with the World Bank's measure. It is significant at the 10 percent level of significance and the direction is consistent with the assumption. Besides, DUM is also significant at the 20 percent level of significance with the World Bank's measure and has a positive sign, which means that the 1997 Economic Crisis significantly caused the capital flight from Thailand. However, DUM is not statistically significant with other measures of capital flight.

Table 4: The Test Result of Regression Equations of Thailand's Capital Flight

Independent Variables	Capital Measurement			
	Cuddington	World Bank	Morgan	Cline
<b>1. CHINF</b>	-0.0721 (-1.8781) <sup>1**</sup>			
<b>2. FINC</b>		-103.8000 (2.1486)*	-93.8595 (1.9743)**	-93.6533 (-2.0661)*
<b>3. OVAL</b>		5.1945 (1.9289)**	4.4642 (1.7304)**	4.3946 (1.7950)**
<b>4. FDI</b>		2.9842 (2.6621)*	2.9736 (2.4187)*	2.8435 (2.3693)*
<b>5. GBUD</b>				
<b>6. CAD</b>	0.3564 (3.3392)*	0.7812 (1.7138)**		
<b>7. DUM</b>		24.6558 (1.3554)****		
<b>R<sup>2</sup></b>	0.7518	0.5097	0.4024	0.3941
<b>Durbin-Watson stat</b>	2.1578	2.0315	1.8812	1.8904
<b>Prob (F-statistic)</b>	0.0000	0.0030	0.0313	0.0366

*Remarks:* The digits in parentheses represent t-statistic value of independent variables in OLS regression model.

Significant at the 5% level (two-tail)

\*\* Significant at the 10% level (two-tail)

\*\*\* Significant at the 15% level (two-tail)

*The Philippines*

Table 5 presents the test result of the regression equation for the Philippines. According to the direct measure of Cuddington (1986), there are two variables that can describe the capital flight from the Philippines. The first variable is the residual between interest rates of US Dollar and Peso (FINC). It has the statistical significance of 10 percent and positive sign according to the assumption, that is an increase in the residual of interest rates leads to an increase in the capital flight of the Philippines.

Table 5: The Test Result of Regression Equations of the Philippines Capital Flight

Independent Variables	Capital Measurement			
	Cuddington	World Bank	Morgan	Cline
1. CHINF				
2. FINC	5.9228 (1.9807) <sup>1**</sup>			
3. OVAL	-0.7962 (-2.6045) <sup>*</sup>			
4. FDI		1.7480 (1.7846) <sup>**</sup>	1.5119 (1.5614) <sup>***</sup>	1.6135 (1.6425) <sup>***</sup>
5. GBUD		3.3956 (1.7151) <sup>**</sup>	3.1492 (1.6813) <sup>***</sup>	3.0627 (1.5978) <sup>***</sup>
6. CAD				
7. DUM			11.2121 (1.5763) <sup>***</sup>	10.5536 (1.4520) <sup>****</sup>
R <sup>2</sup>	0.2866	0.5366	0.6142	0.5886
Durbin-Watson stat	1.9305	2.1293	2.0505	2.0338
Prob (F-statistic)	0.1272	0.0006	0.0001	0.0003

*Remarks:* The digits in parentheses represent t-statistic value of independent variables in OLS regression model.

Significant at the 5% level (two-tail)

\*\* Significant at the 10% level (two-tail)

\*\*\* Significant at the 15% level (two-tail)

The second variable is the overvalued of the local currency (OVAL). It has the statistical significance at 5 percent and has negative sign according to the assumption.

With the indirect measures of capital flight, FDI can describe the capital flight from the Philippines. It has the statistical significance at 10 percent and 15 percent levels. Also, it is in line with the Discriminatory-Treatment Perspective. This implies that the Philippino government gives privilege to foreign investors which makes the dissatisfied local investors moving their capital to other countries with more interesting return on investment. The second variable that can describe the capital flight, only with indirect measures, is the government budget deficits (GBUD). It has the statistical significance and positive direction which is in line with the assumption. That is, the government budget deficits lead to concerns, by investors, that the government might raise tax to compensate the deficits. The people will then move their capital to foreign countries to avoid the higher tax in the future. The DUM has the statistical significance of 10 percent, only with indirect measures of Morgan Guaranty Trust (1986) and Cline (1987) and has positive relation. This means that the 1997 Economic Crisis significantly leads to the capital flight from the Philippines.

### *Indonesia*

Table 6 shows the result of the regression test for Indonesia. According to the direct measure of Cuddington (1986), there are six variables describing the capital flight from Indonesia. The first variable is the difference between interest rates of US Dollar and Indonesia Rupiah (FINC), which has the statistical significance of 5 percent. It has negative relation which is in line with the assumption. The second variable is the overvaluated currency (OVAL) with the statistical significance of 5 percent. It has positive relation which is in line with the assumption, meaning the overvaluated Rupiah leads to the capital flight from Indonesia. The third variable is Foreign Direct Investment (FDI) with the statistical significance of 15 percent and a positive relation in accordance with the Discriminatory-Treatment Perspective. That is, the government gives privileges to foreign investors over the local investors and, thus,

Table 6: The Test Result of Regression Equations of Indonesia Capital Flight

Independent Variables	Capital Measurement			
	Cuddington	World Bank	Morgan	Cline
1. CHINF				
2. FINC	-4.6162 (-4.2257) <sup>1*</sup>	-8.0937 (-1.6712) <sup>***</sup>	-6.2776 (-2.4682) <sup>*</sup>	-6.5021 (-2.9742) <sup>*</sup>
3. OVAL	0.0009 (2.1896) <sup>*</sup>	0.0035 (1.8906) <sup>**</sup>	0.0031 (2.2993) <sup>*</sup>	0.0030 (2.5179) <sup>*</sup>
4. FDI	0.4748 (1.6694) <sup>**</sup>			
5. GBUD	-1.2296 (-3.7651) <sup>*</sup>	2.0131 (1.5921) <sup>***</sup>	1.5794 (1.3418) <sup>****</sup>	
6. CAD	0.9835 (4.3318) <sup>*</sup>	1.2631 (1.8893) <sup>**</sup>		
7. DUM	6.7180 (3.3947) <sup>*</sup>			
R <sup>2</sup>	0.5427	0.4941	0.3422	0.2983
Durbin-Watson stat	1.9950	1.9816	1.9309	1.9011
Prob (F-statistic)	0.0041	0.0120	0.0913	0.1670

*Remarks:* The digits in parentheses represent t-statistic value of independent variables in OLS regression model.

\* Significant at the 5% level (two-tail)

\*\* Significant at the 10% level (two-tail)

\*\*\* Significant at the 15% level (two-tail)

the increase in FDI occurs at about the same time as the capital flight from Indonesia.

The fourth variable is the government budget deficits (GBUD). It is significant at the 5 percent level of significance while having negative relation which is contradict to the assumption. The fifth variable is the current account deficit (CAD) with 5 percent statistical significance and positive relation in line with the assumption. This means current account

deficits is a sign of bad economic situation and, thus, leads to capital flight from the country. The last variable is DUM with 5 percent statistical significance and positive relation in accordance with the assumption. That is, the 1997 Economic Crisis leads to an increase in the capital flight from Indonesia.

According to indirect measures, the difference between interest rates of US Dollar and Indonesian Rupiah can describe Indonesian capital flight. It has 5 and 15 percent of statistical significance. It has negative relation which is contradict to the assumption but is in line with the result of the direct measure of Cuddington (1986). The second variable, which is the overvaluation of currency (OVAL), can describe the capital flight. It has 5 and 10 percent of statistical significance and has positive relation in line with the assumption. This means that the overvaluated Rupiah leads to the capital flight. The third variable, Government Budget Deficits (GBUD), can describe the capital flight only with measures of the World Bank (1985) and Morgan Guaranty Trust (1986). It is significant at the 15 percent level of significance and has a positive sign which is in line with the assumption. This means that the government budget deficits will lead to capital flight because of the fear that the government will raise interest rates to compensate the deficits. The last variable, Current Account Deficits (CAD) is at the 10 percent statistical significance and has a positive relation in line with the assumption. The increase in current account deficits is a sign of bad economic situation. This leads to the capital flight as people are trying to move their capital to invest in other countries that is more stable and gives more interesting return.

### *Malaysia*

Table 7 shows the test result for the case of Malaysia. With Cuddington's direct measure, there are three variables describing the capital flight. The first one is the difference between interest rates of US Dollar and Malaysian Ringgit. It is significant at the 5 percent level of significance and has a positive relation in accordance with the assumption. The second variable is the overvaluation of the currency (OVAL) with 5 percent statistical significance and negative relation contradict to the

assumption. The third variable is Foreign Direct Investment (FDI). It is significant at the 5 percent level of significance and in line with the Discriminatory-Treatment Perspective. This is the fact that the Malaysian government gives privileges to foreign investors cause the dissatisfied local investors to move their capital abroad. Thus, the capital flight by Malaysians exists at the same time as the FDI.

Table 7: The Test Result of Regression Equations of Malaysia Capital Flight

Independent Variables	Capital Measurement			
	Cuddington	World Bank	Morgan	Cline
1. CHINF		-1.2009 (-2.3474)*	-1.3876 (-1.3381)****	-1.5882 (-1.5124)***
2. FINC	56.7460 (2.0959) <sup>1*</sup>			
3. OVAL	-30.3411 (-1.8843)**			
4. FDI	0.8897 (2.1805)*	6.7820 (6.0553)*		(1.8580)**
5. GBUD			0.5476 (1.7512)**	0.5966 (1.9121)**
6. CAD			0.9599 (2.2429)*	1.1034 (2.7183)*
7. DUM			35.3675 (2.0360)**	40.7254 (2.4456)*
R <sup>2</sup>	0.7229	0.6789	0.4488	0.4777
Durbin-Watson stat	1.5782	2.1818	1.9900	1.9419
Prob (F-statistic)	0.0000	0.0001	0.0288	0.0167

*Remarks:* The digits in parentheses represent t-statistic value of independent variables in OLS regression model.

Significant at the 5% level (two-tail)

\*\* Significant at the 10% level (two-tail)

\*\*\* Significant at the 15% level (two-tail)

According to the indirect measures, an increase in inflation rates (CHINF) can describe the capital flight. It has 5, 15 and 20 percent of statistical significance and negative relation contradicts to the assumption. The second variable, Foreign Direct Investment (FDI), has statistical significance only with the measures of World Bank (5 percent) and Cline (15 percent). This variable is in line with the Discriminatory-Treatment Perspective. The third variable is the Government Budget Deficits (GBUD). It has 10 percent statistical significance only with measures of Morgan Guaranty Trust (1986) and Cline (1987) and has positive relation in line with the assumption. That means an increase in the government budget deficits leads to the capital flight. The fourth variable is the Current Account Deficits (CAD). It has 5 percent statistical significance only with measures of Morgan Guaranty Trust (1986) and Cline (1987) and has positive relation in accordance with the assumption. That is, the current account deficits are a sign of bad economic situation that leads to the capital flight. The last variable, DUM, has statistical significance only with measures of Cline (at the 5 percent level) and Morgan Guaranty Trust (at the 10 percent level) and has positive relation in line with the assumption. This means the 1997 Asian Economic Crisis leads to an increase in the capital flight from Malaysia.

### *South Korea*

Table 8 shows the test result for South Korea's case. With the direct measure of capital flight by Cuddington (1986), there are three variables describing the capital flight from South Korea. The first variable is Foreign Direct Investment (FDI) with 15 percent of statistical significant and positive relation in line with the Investment Climate Perspective. In other words, the good investment climate in South Korea results in the low investment risk, which attracts increased investment from foreign countries. At the same time, there is likely to be less capital flight as the investment at home offers more attractive returns than the investment overseas. The next variable is Government Budget Deficits (GBUD), with 5 percent statistical significance and positive relation in line with the assumption. The last variable is Current Account Deficits (CAD) with 5 percent statistical significance.

Table 8: The Test Result of Regression Equations of South Korea Capital Flight

Independent Variables	Capital Measurement			
	Cuddington	World Bank	Morgan	Cline
1. CHINF				
2. FINC			16.7282 (1.3875)****	
3. OVAL		-0.0621 (-2.2093)*	-0.0514 (-2.4576)*	-0.0467 (-2.3462)*
4. FDI	-0.5881 (-1.6008) <sup>1</sup> ***			
5. GBUD	0.0724 (2.2080)*	-0.5286 (-3.1433)*	-0.3109 (-2.3655)*	-0.2907 (-2.1974)*
6. CAD	0.1366 (2.3602)*	3.3368 (9.4496)*	2.7588 (10.3647)*	2.6752 (10.3611)*
7. DUM		-11.0358 (-1.8170)**	-9.3420 (-1.9869)**	-8.9326 (-1.9323)**
R <sup>2</sup>	0.7729	0.8157	0.8630	0.8556
Durbin-Watson stat	1.9601	2.1625	2.2717	2.2289
Prob (F-statistic)	0.0000	0.0000	0.0000	0.0000

*Remarks:* The digits in parentheses represent t-statistic value of independent variables in OLS regression model.

\* Significant at the 5% level (two-tail)

\*\* Significant at the 10% level (two-tail)

\*\*\* Significant at the 15% level (two-tail)

In addition, according to indirect measures, there are five variables for the capital flight from South Korea. The first variable is the difference between interest rates of US Dollar and Korean Won (FINC). This variable is significant at the 15 percent level of significance only with the measure of Morgan Guaranty Trust (1986) and the sign is in line with the assumption. The second variable is the overvaluation of local

currency (OVAL). It has 5 percent statistical significance, when considering all three measures, while having negative sign contradicts to the assumption. This means the appreciation of Korean Won leads to a decrease in capital flight from South Korea. The third variable is Government Budget Deficits (GBUD). It is significant at the 5 percent level of significance in all cases and has negative relation in accordance with the assumption, meaning that the government budget deficits lead to a decrease in capital flight. The fourth variable is Current Account Deficit (CAD) with 5 percent statistical significance and positive relation in line with the assumption. It implies that current account deficit is a sign for economic recession which leads to an increase in the capital flight. The last variable is DUM with 10 percent statistical significance and negative relation contradict to the assumption. That is, the 1997 Economic Crisis resulted in a lower level of capital flight from South Korea. From this, it is interesting to note that South Korea is the only country having the result in contrast to other four countries.

#### **4.4. Policy Implementation**

Findings from the research reveal that macro-economic factors, be it domestic inflation rates, local currency value and domestic interest rates, are the motivation for capital flight in Asia. Thus, the government of each country needs to pay attention in implementing economic policies to promote the well-balanced and stable economy, for example, keeping the country's inflation rates in the appropriate level and avoiding rapid changes as well as adopting the foreign exchange system that keep the value of the country's currency as realistic as possible.

However, from previous experience, governments of many developing countries tend to avoid any change of economic policies that would affect the value of local currency for the reason of their political stability. As a result of this, many currencies become misled without the government's notice that it can lead to huge damage to the country, for instance, an attack on the local currency by the speculators or the massive capital flight. In addition, it is found out that adopting the appropriate interest rate policy, in accordance to the major currency like US Dollar, will help reduce the problem of capital flight. This is because

of the fact that the more the country's financial market is integrated with the international financial markets, the more there is a comparison between return on investment from various financial markets. Consequently, the appropriate interest rates will help reduce the gap between the return on investment of local and foreign investors.

Next, it is detected that the Foreign Direct Investment (FDI) can explain the capital flight as most of the research result supports the Discriminatory-Treatment Perspective. All countries featured in this research have been promoting economic policies that push them towards the industrialization or semi-industrialization, focusing on creating a rapid economic growth. Once the countries' savings cannot accommodate such growth, they have to draw a huge amount of foreign investment. The governments, then, have to compete in acquiring investments from overseas. This is, for example, giving privileges to foreign investors despite the fact that there also exists the same kind of businesses by local investors. This causes the gap between the investment opportunities for the local and foreign investors, which drives the disadvantaged local to move their investment to other countries. From this, the governments should be aware of this fact, consider if their investment promotion policy would cause the capital flight and find the solutions to the problem.

In addition, research findings also show that the risk from current account deficits and government budget deficits are sources for an increase in the capital flight. These factors are indicators for the economic recession for the countries. Therefore, the governments should try to reduce an investment risk that is to promote a pleasant investment climate to the countries. Once, the investment climate is improved and the risk is reduced, the capital flight will be decreased accordingly.

## **5. Conclusions**

This paper studies the capital flight from five Asian countries, including Thailand, the Philippines, Indonesia, Malaysia and South Korea, which were attacked by the 1997 Economic Crisis. The study uses quarterly data from each country during 1991 to 2000. Initially, supporting evidence shows that there significantly was capital flight from these five

countries. That is, the total value of capital flight during the mentioned period was lowest at 8.49 billions dollars in the case of Indonesia and highest at 25.71 billions dollars in the case of Thailand. In addition, Indonesia had the lowest capital flight figures in percentage to GDP at 4.69 and the Philippines had the highest at 1946, considering by Cuddington's (1986) direct measure. Besides, analyzing the structural change of capital flight, by direct and indirect measures, it was found out that the Economic Crisis in 1997 significantly posed an impact on the structure of capital flight from those countries. This finding is in line with past studies that financial and economic crises in each country were the significant origin of an increase in capital flight.

Findings from the test of Regression Equation to figure out the determinants for capital flight reveal that there are five factors which influence capital flight from Thailand. These comprise increased inflation rates, difference between interest rates of US Dollar and Thai Baht, overvaluation of Baht, foreign direct investment and current account deficit. In the case of the Philippines, there are four determinants for capital flight, which are difference between interest rates of US Dollar and the Philippines' Peso, overvaluation of Peso, foreign direct investment and government budget deficit.

Furthermore, there are five determinants for Indonesian capital flight, including difference between interest rates of US Dollar and Indonesian Rupiah, overvaluation of Rupiah, foreign direct investment, government budget deficit and current account deficit. As for Malaysia, six determinants for capital flight are found. These consist of increased inflation rates, difference between interest rates of US Dollar and Malaysian Ringit, overvaluation of Ringit, foreign direct investment, government budget deficit and current account deficit. Lastly, there are five factors for South Korea's capital flight, which are difference between interest rates of US Dollar and Korean Won, overvaluation of Won, foreign direct investment, government budget deficit and current account deficit.

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