RECENT PORTFOLIO INVESTMENT AND CENTRAL BANK POLICY IN THAILAND

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RECENT PORTFOLIO INVESTMENT AND CENTRAL BANK POLICY IN THAILAND

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RECENT PORTFOLIO INVESTMENT AND CENTRAL BANK POLICY IN THAILAND

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Date of Graduation

VITA

Noppadon Sathitsuksanoh, son of Thawat Sathitsuksanoh and Lawan Sae Koo, was born on January 28, 1980 in Bangkok, Thailand. He attended Chinorot High School and graduated 1995. He enrolled in the Chemical Engineering program at Thammasat University in Bangkok, Thailand where he graduated with a Bachelors of Science in Chemical Engineering in May 1999 and enrolled in Graduate School at Southern Illinois University shortly thereafter to pursue a Masters of Science in Mechanical Engineering. He graduated from Southern Illinois University with his Masters in May 2004. In January 2007, he enrolled in Graduate School at Auburn University.

THESIS ABSTRACT

RECENT PORTFOLIO INVESTMENT AND CENTRAL BANK POLICY IN THAILAND

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The present study investigates the dynamic adjustment of portfolio investment to monetary and fiscal variables in Thailand over recent years. The analysis reveals that the exchange rate, inflation, and the government budget have temporary impacts on portfolio investment, while the effect of inflation appears to be persistent. In the near term, the variation of portfolio investment depends on inflation shocks and its own shock. The variation of portfolio investment from inflation appears to be dominant over the medium term.

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Style manual used: The Review of International Economics

Computer software used: Microsoft Word, Microsoft Excel, Adobe Photoshop, Gauss, Stata

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I. INTRODUCTION

During the 1990s, the Thai economy experienced a switch of monetary policies, a regime switch from fixed to floating exchange rates in 1997, financial liberalization, the Asian crisis, and an IMF rescue. Thailand had been considered an "East Asian Miracle" but during the crisis financial institutions closed, the stock market bubble burst, and foreign investors withdrew. These factors have had an impact on the Thai economy through the financial sector. The present thesis focuses on international portfolio investment (equity securities), important for short term financial liquidity.

Other countries such as the Philippines, Indonesia, and South Korea faced severe currency depreciation and recession as a result of the Asian financial crisis. The causes and consequences of the Asian financial crisis are addressed by Broom and Morley (2004), Zurbruegg and Allsopp (2004), Fernandez-Izquierdo and Lafuente (2004), and Holden, Thompson, and Ruangrit (2005) regarding the economic impacts on trade, exports, and poverty. In financial globalization theory, all economies are viewed as interdependent. Influences from one country can easily spread to other countries. Countries can benefit from globalization by international trade but these developments often make financial sectors more vulnerable.

The crisis in Thailand has receded, but the ramifications of the Asian financial crisis caused the Thai economy to undergo slow economic liberalization with high

international debt, low government surplus, and decreased foreign investment. Portfolio investment is considered one of the important driving forces of the globalization of economic liberalization. To achieve foreign investment, Thailand has to create an economically secure environment for foreign investors. The argument is based on an assumption that international financial flows are more likely to move towards those economies characterized by economic liberalism, smaller government sectors relative to total output, lower levels of corporate taxation, and stable monetary policies. The basic question is whether the government crowded out portfolio investment in Thailand and whether the exchange rate and inflation continue to offer incentives for portfolio investment. To understand the Thai financial sector, its monetary and exchange rate framework should be addressed.

Before the Second World War, the Thai baht was tied to the British pound at a rate of 11 baht per pound. After the Second World War, the Thai economy became unstable and development of monetary framework in Thailand covered during three regimes.

1. *Pegged exchange rate regime*

   This regime was adopted after the Second World War. The value of Thai baht was initially either pegged to a major currency/gold or to a basket of currencies. The fixed exchange rate was adopted from November 1984 until June 1997.

2. *Monetary targeting regime*

   After the floating exchange rate system was adopted in July 1997, Thailand received financial assistance from the IMF. Under this system, the Bank of

Thailand targeted the domestic money supply using the financial programming approach to ensure macroeconomic consistency with the objectives of sustainable growth and price stability. The Bank of Thailand set the daily and quarterly monetary base targets on which its daily liquidity management was based. Daily liquidity management was essentially aimed to avoid excessive volatility in interest rates and liquidity in the financial system.

3. *Inflation targeting regime*

   During the IMF rescue program, the Bank of Thailand made an extensive reappraisal of both the domestic and external environment and concluded targeting of money supply was ineffective. The relationship between money supply and growth was not stable, especially during the period after the crisis and with the uncertainty in credit extensions as well as the rapidly changing financial sector. The Bank of Thailand adopted an inflation targeting system in May 2000.

This thesis examines the effect of monetary and fiscal variables on portfolio investment over the period 1997:7-2006:11 covering both monetary and inflation targeting. A large amount of foreign capital outflows followed the crisis, especially short term financial capital portfolio investment. Considering Thailand a small open economy, efficient taxation of foreign capital depends on relative capital mobility. There is no justification for favoring portfolio investment over foreign direct investment. However, portfolio investment appears to be more mobile and affects the higher return to portfolio investment than others in the case of Thailand.

II. LITERATURE REVIEW

2.1 Motivation

Black and Black (1999) state that the cause of the Thai financial crisis was the fixed exchange rate system. A fixed exchange rate eliminated foreign exchange risk but overvalued the Thai baht. Moreover, heavy government involvement in the financial sector did not help the situation and caused a slow recovery (Haggard, 2000). This reasoning supports Shaw (1973) who believes government intervention slows economic growth and creates financial repression since the government controls the monetary system through its financial institutions.

The government will have a large impact on the financial decisions in terms of credits and loans to businesses. For example, if the government sets an interest rate ceiling and determines credit allocation, saving in commercial banks will be low because the interest rate ceiling may lead to a negative real interest rate. This results in a decrease in motivation to deposit savings in commercial banks. As a result commercial banks do not have money to lend, and investment and economic growth will be low (McKinnon, 1973).

This approach suggests that less government involvement and intervention should result in more investment by allowing market mechanisms to allocate credit, adjust the interest rate, and determine international financial flows.

2.2 Before the Asian Crisis

The Thai financial structure became a major part of Thai economy in the 1970s with an increasing number of commercial banks and the establishment of a stock market exchange in 1975. Before 1983, the Thai economy suffered from the oil crisis and the Bank of Thailand adopted a fixed exchange rate that integrated the Thai baht with the world money markets, and the Thai economy recovered rapidly from recession. Multinational corporations started to establish in Thailand as a result.

With the help from G7 nations (Canada, France, West Germany, Italy, Japan, the United Kingdom, and the United States) Thailand transformed from an agricultural based country into an industrialized country. The continuously high economic growth rate reduced the Thai budget deficit. Though inflation kept increasing from 1984 to 1997 as shown in Figure 1, the Thai government exercised fiscal policy to reduce public borrowing and there were budget surpluses for 7 years creating economic stability and confidence among foreign investors.

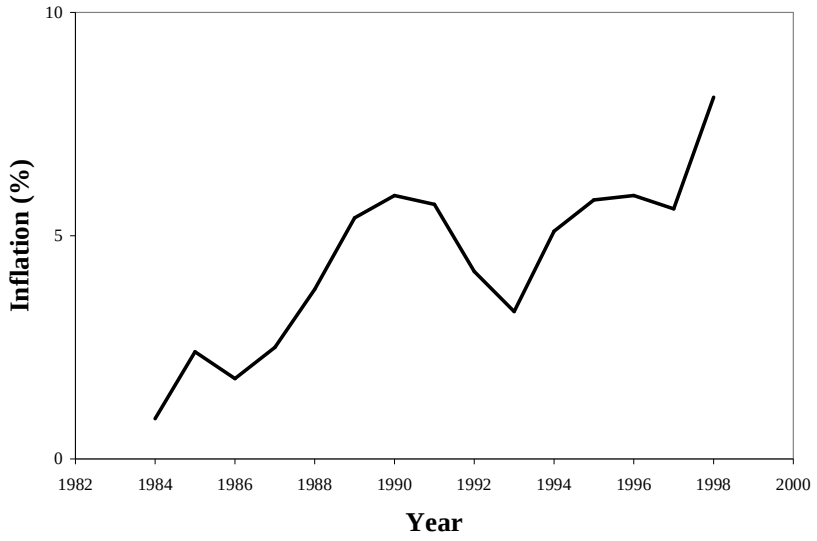

Figure 1: Time series of average annual inflation: consumer prices (index 2000=100)), Source: Bank of Thailand

2.3 During the Asian Crisis

The high economic growth of Thailand from 1984 to 1997 created a tremendous increase in investment causing property values and stock prices to increase (especially stocks in the financial and real estate sectors). The 1990-1996 period is known as a boom for financial flows to market economies creating excess liquidity. This liquidity, however, with high inflation in a fast growing economy pushed Thailand into a financial bubble.

With a high degree of economic expansion, the government deficit should decrease and the current account should increase, but this was not the case for Thailand. Considering Thailand an open economy during this period, it was viewed to be rather stable and there should have been an increase in the current account of the balance of payments. However, a surplus in the current account was not in the picture as shown in Figure 2. Did the lack of fiscal restraint cause the crisis?

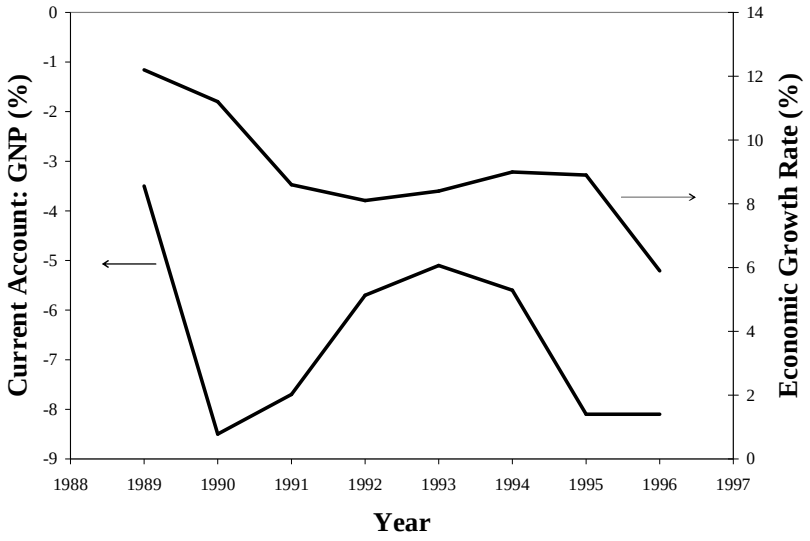

Figure 2: Time series of Current Account:GNP (%) and Economic Growth Rate (%), Source: National Economics and Social Development Board, Bank of Thailand

The strategy of an open economy was a success with high economic growth until financial liberalization in 1993. The goal of financial liberalization was to restructure the economy from an agriculture base to be more industrialized. After 1993, Thailand had a large increase in investment inflow, but at the same time an increase in imports of machinery and other capital from abroad increased. Net exports were not able to offset the current account deficit.

With lower wages in the labor markets of neighboring countries such as Vietnam, Laos, and Cambodia, Thai products were not competitive in the world market. As a result, the current account showed a large decrease after 1993 creating more debt and foreign borrowing. With the fixed exchange rate regime, monetary policy was almost ineffective to stabilize the economy. It can be said that Thailand's financial crisis started from financial liberalization in 1993.

For an open economy, output (Y) equals consumption (C), investment (I), Government spending (G), and net exports (X - M) as

$$Y = C(\overset{+}{Y}) + I(\overset{-}{r}) + G + (X - M) \quad (1)$$

where r stands for real interest rate. With low net exports, high inflation, foreign debts, and ineffective monetary policy, a current account surplus might have caused a mild recession instead of a currency crisis.

There has been recovery in financial markets in Thailand. As reasonable policies are carried out, such as adjusting the exchange rate regime due to IMF supported programs of inflation targeting in 2000, investor confidence should recover. Since the crisis stems from financial markets, it is believed that the recovery process depends on foreign investment (IMF, 1998). As a result, this thesis will examine the factors that may affect inflows of short term portfolio investment and its determinants during monetary and inflation targeting.

2.4 Proposed methodology

Portfolio investment may be influenced by monetary and fiscal variables. The government budget is defined as government revenue less government expenditure. With government deficits, the government is likely to print money to finance its deficit. The government may also sell bonds or debt to the public (Piontkivshy, Bakun, Kryshko, and Sytnyk, 2001). The inflation can be influenced by the government through fiscal policy. Expenditure cuts or tax increases can defer inflation (Sargent and Wallace, 1981). This

flexibility indicates a change of policy variables is endogenous and cannot be estimated consistently by OLS because of endogeneity.

As a result, this thesis employs an structural vector autoregression (SVAR) model to examine the shocks of variables on portfolio investment. Monetary factors, such as the exchange rate and inflation, may affect portfolio investment. Fiscal variables can be important as changes in the composition of the government balance can affect the level of investment inflow in the country. Variables in the thesis are

EXC	the exchange rate
IFL	a measure of core inflation
GOB	government budget surplus (revenue less expenditure)
PIV	portfolio investment

The PIV variable is a net flow of portfolio investment (equity securities) including real estate investment trusts that reflects the inflow of funds from private investors. Assuming the Mundell-Flemming condition (Flemming, 1962) holds (ISLMBP model), Thai economy is a small open economy (SOE) with perfect capital mobility and capital mobility, exchange rate system, and monetary policy are independent from one another. This condition means the Thai economy does not affect the rest of the world. This thesis will focus on the behavior of the Thai economy investigating the dynamic response of portfolio investment to various shocks and the length of these effects. Results will give a better understanding of the economy in a number of ways.

First, this thesis will explore how inflation targeting contributes to the adjustment of flow in portfolio investment and the short and long term relationship between portfolio investment and its determinants. Secondly, this thesis will show whether the monetary or

fiscal variables are more important in affecting portfolio investment. The SVAR model will show how a particular shock exerts an influence on PIV. The focus is on the dynamic adjustment of portfolio investment to other shocks.

III. EMPIRICAL ANALYSIS

In the absence of contemporaneous exogenous variables, the variance-covariance matrix contains information about contemporaneous correlations among variables. As a result, the effects of monetary variables (exchange rate EXC and inflation IFL) and the fiscal variable (government budget surplus GOB) on portfolio investment (PIV) are investigated utilizing an SVAR model.

In the SVAR model, a recursive approach yields a lower triangular matrix indicating the ordering of the four variables. The lower triangular matrix restricts the first variable to be contemporaneously independent of all other variables while the last variable is allowed to be influenced contemporaneously by all other variables. The ordering throughout this thesis is

$$x_t^{'} = (EXC \quad IFL \quad GOB \quad PIV) \tag{2}$$

This ordering implicitly assumes the exchange rate is independent of all other variables but can influence other variables. The Bank of Thailand does not react immediately to shocks in inflation and the government budget since they cannot be observed immediately. Portfolio investment is put last since we consider portfolio investment determined endogenously depending on the exchange rate, inflation, and the government budget. After defining the ordering of the matrix and instantaneous relations, the SVAR representation can be written as

$$B_0 x_t = a + B_1 x_{t-1} + B_2 x_{t-2} + B_3 x_{t-3} + ... + B_p x_{t-p} + u_t \ \textit{with}\ u_t \sim iid(0, I) \qquad (3)$$

Multiplication by B_0^{-1} leads to the reduced VAR representation:

$$x_t = \alpha + A_1 x_{t-1} + A_2 x_{t-2} + A_3 x_{t-3} + ... + A_p x_{t-p} + \varepsilon_t \ \textit{with}\ \varepsilon_t \sim iid(0, \Sigma_\varepsilon) \qquad (4)$$

where $A_i = B_0^{-1} \cdot B_i,\ i = 1,2,..., p\ , \varepsilon_t = B_0^{-1} \cdot u_t$, and $\Sigma_\varepsilon = B_0^{-1} \cdot \Sigma_u \cdot (B_0^{-1})'$

Note that B_0^{-1} can be converted to B_0 as

$$B_0^{-1} = \begin{pmatrix} c_{11} & 0 & 0 & 0 \\ c_{21} & c_{22} & 0 & 0 \\ c_{31} & c_{32} & c_{33} & 0 \\ c_{41} & c_{42} & c_{43} & c_{44} \end{pmatrix} \rightarrow B_0 = \begin{pmatrix} B_{11} & 0 & 0 & 0 \\ B_{21} & B_{22} & 0 & 0 \\ B_{31} & B_{32} & B_{33} & 0 \\ B_{41} & B_{42} & B_{43} & B_{44} \end{pmatrix}$$

B_0^{-1} can be obtained by the Cholesky decomposition of the error variance-covariance matrix Σ_ε using Sims specification (Sims, 1980) that assumes there exists contemporaneous correlation between the u_t. This B_0^{-1} is a uniquely specified matrix (lower triangular) decomposed from Σ_ε, a positive diagonal definite matrix. The off diagonal elements of Σ_ε are non-zero as

$$\Sigma_u = 1 \rightarrow \Sigma_\varepsilon = B_0^{-1} \cdot I \cdot (B_0^{-1})' \rightarrow \Sigma_\varepsilon = B_0^{-1}(B_0^{-1})'$$

Since B_0^{-1} is a lower triangular matrix, it follows that only a shock in the first variable of a VAR(p)-process has an influence on the rest of the variables and the following variables do not have a direct impact on the previous variable. Thus the ordering of the variables plays a key role in this specification.

Identifying a vector of interest is an incomplete story about the interaction between variables in a system. The impulse response functions are employed to investigate the response of one variable to an impulse in another variable, suggesting

percentage deviation of a variable over time after a one-time one percent increase in variable shocks. The effect of a shock depends on the ordering. As a result, generalized impulse response functions will be utilized to test the robustness of the ordering since the ordering will change the response significantly.

3.1 Data Set Characteristics

The frequency of the data is monthly covering the period 1997:1 to 2006:11 as shown in the time series plots in Figure 3.

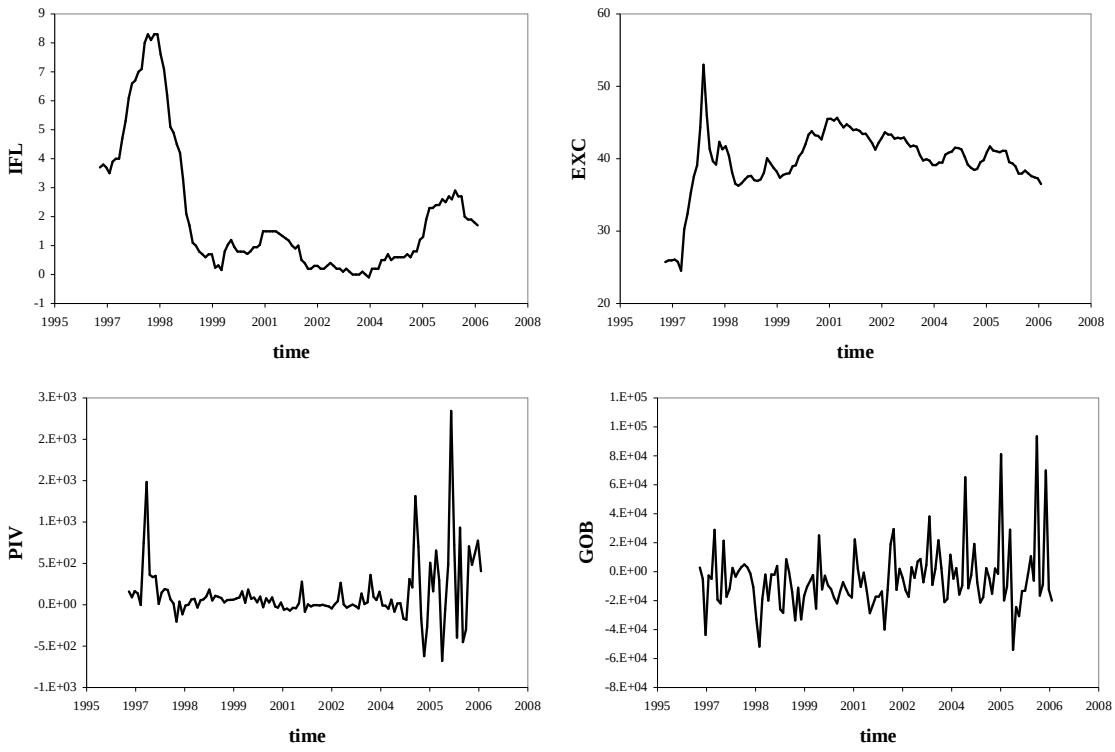

Figure 3: Time series data

The source and units of all variables are shown in Table 1. All variables are expressed in logarithmic form except IFL since inflation is the percentage change of price level.

Table 1: Data used for estimation

Symbol	*Description*	*Unit*	*Source*
PIV	Net flow of portfolio investment	Million in US dollars	
EXC	Nominal exchange rate	Thai Baht/US dollars	Bank of
GOB	Government balance	Million in baht	Thailand
IFL	Core inflation	%	

3.2 Unit roots

The unit root test suggested by Ng and Perron (2001) using ADF with a general to specific lag selection rule (Hall, 1994) is estimated. The ADF test statistics in Table 2 shows the null hypothesis of a unit root cannot be rejected for GOB and EXC.

Table 2: ADF unit root test (Lag selection by general to specific)

Variables	*Level*	*First difference*
PIV	-3.01	
EXC	0.32	-10.93
IFL	-2.89	
GOB	-1.72	-8.25

Critical values are approximately -3.43, -2.86, and -2.57 at 1%, 5%, and 10% levels

The results from these tests indicate that portfolio investment and inflation do not exhibit a stochastic trend, but stationary variables can be obtained by first differencing the logs (growth rates) of these two series. This property indicates that all shocks will change PIV temporarily and the effect will dampen and converge to its mean in a mean reversion process.

As a result, vector, $x_t^{'}$ can be expressed as

$$x_t^{'} = (\Delta EXC \quad IFL \quad \Delta GOB \quad PIV) \tag{5}$$

3.3 Lag Order Selection

To define the lag order of a VAR(p)-process, the Akaike information criterion (AIC), the Schwarz information criterion (SIC), and the Hannan-Quinn information criterion (HQ) are utilized. As shown in Table 3, the AIC suggest 11 lags while the SIC and HQ agree on 2 lags. The AIC criterion is known to overstate the number of lags. Therefore, a VAR(2) model is estimated.

Table 3: Lag Order Selection

Lag	*AIC*	*HQ*	*SIC*
1	23.37	23.54	23.77
2	22.88	23.20*	23.68*
3	22.81	23.30	24.02
4	22.60	23.25	24.21
5	22.61	23.42	24.62
6	22.31	23.28	24.72
7	22.28	23.42	25.09
8	22.26	23.57	25.48
9	22.38	23.85	26.00
10	22.42	24.05	26.44
11	22.11*	23.91	26.54
12	22.27	24.22	27.09

3.4 Reduced form

Since the unit root and lag order of the VAR model are identified, the reduced form can be written as

$$x_t = \alpha + A_1 x_{t-1} + A_2 x_{t-2} + \varepsilon_t \ \textit{with}\ \varepsilon_t \sim iid(0, \Sigma_\varepsilon) \tag{6}$$

where vector x_t contains growth rates of the stationary variables and GOB and EXC, bot of which are nonstationary. The errors ε_t are orthogonal to the regressors but instantaneous correlation between errors is allowed: $\varepsilon_t \sim iid(0, \Sigma_\varepsilon)$.

3.5 Impulse Response Analysis

Impulse response functions are based on a Wold moving average representation of a VAR(2) process to investigate dynamic interactions between endogeneous variables (Pindyck and Rubinfeld, 1998).

VAR(2)

Impulse response functions for the VAR(2) process, ordered EXC, IFL, GOB, PIV, are plotted in Figure 4 for 36 periods (3 years). In this VAR system, the impact of shocks on PIV is expected to converge to zero since PIV is stationary. The decaying speed may be different for different shocks, and there is interest in the mean reverting process.

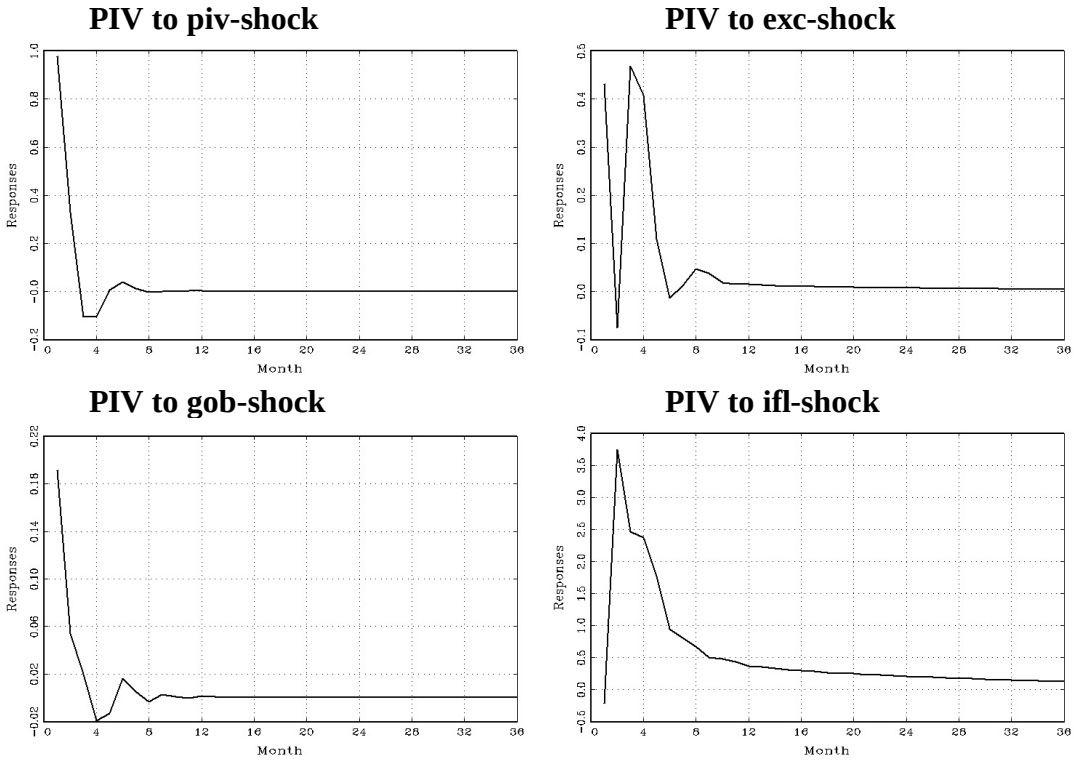

Figure 4: Impulse response of portfolio investment to one standard deviation shock

Figure 4 displays the dynamic response of portfolio investment to various unitary shocks. Responses of PIV to EXC, IFL, and GOB shocks have temporary effects. This property is expected for a stationary variable. However, the response of PIV to an IFL shock appears to be persistent over 36 periods.

Variance decomposition will be utilized to sort out the importance of each shock on PIV. The impulse-response function of PIV due to an EXC shock displays an increase in PIV due to a positive EXC shock.

Assuming Thailand is a small open economy (SOE), capital is mobile across countries. An increase in PIV due to Thai baht depreciation can be explained by uncovered interest rate parity (UIP),

$$i = i^* + E_t(S_{t+1}) - S_t \qquad (7)$$

where i stands for domestic nominal interest rate, i^* is the exogenous foreign nominal interest rate, S_t is current exchange rate (Baht/US dollar), and $E_t(S_{t+1}) - S_t$ is the expected capital gain.

Assuming that UIP holds and investors are risk neutral, the forward rate $F_{t,t+1}$ is the same as expected future spot rate $E_t(S_{t+1})$. The right hand side of (7) can be simply interpreted as a return on foreign currency (R_f) and the left hand side can be viewed as a return on domestic currency (R_d).

Given an expected exchange rate, an increase in the exchange rate (baht depreciation) causes an increase in holding baht. As a result, the expected return on foreign currency decreases causing the baht to become more attractive and portfolio investment to rise. This says an unexpected depreciation makes investments in baht unexpectedly cheaper and more attractive but it disregards any change in the expected depreciation for the future.

The impulse response function of portfolio investment on inflation shock shows an immediate negative effect, close to its unconditional mean (negligible). With 2 month lags, an increase in inflation has a positive impact on portfolio investment.

Based on the Fisher equation in (8) below, an increase in either the real interest rate (r) or expected inflation (π^e) will cause a nominal interest rate to increase,

$$i = r + \pi^e \qquad (8)$$

With information on expected inflation, the central bank usually responds by increasing the nominal interest rate. Assuming the policy is successful, π_{t+1} might not rise due to the anti-inflationary action by the central bank.

Will an increase in nominal interest rate (high return on domestic currency) lead to currency appreciation? This might not be the case. There are two possible scenarios,

$$r \uparrow \rightarrow i \uparrow \rightarrow e \downarrow \tag{8a}$$

$$\pi^e \uparrow \rightarrow i \uparrow \rightarrow e \uparrow \tag{8b}$$

The impulse response function of an inflation shock on portfolio investment follows (8b). An increase in inflation will weaken the baht, which corresponds to the increase in the exchange rate in (8b). As a result, the expectation of the future domestic exchange rate will rise creating a capital inflow of portfolio investment as shown in an increase in portfolio investment with 2 lags.

This result of an increase in portfolio investment is consistent with the finding from Clarida and Waldman (2007) who show that for inflation targeting countries, an expected inflation will lead to a stronger currency because the central bank will respond using anti-inflationary action by raising the real interest rate. To understand this, equations (16) and (18) of Clarida and Waldman can be rewritten as

$$S_t = -E_t \sum_{j=0}^{\infty} [b(\pi_{t+j} - \pi^*) + aY_{t+j}] \tag{9}$$

where π_t denotes home inflation rate relative to foreign inflation rate π^*, and Y_t is the home output gap. Given that S_{t-} and S_{t+} indicate the exchange rate before and after the expected inflation announcement, (9) can be written as

$$S_{t+} - S_{t-} = -(E_{t+} - E_{t-}) \sum_{j=0}^{\infty} [b(\pi_{t+j} - \pi^*) + aY_{t+j}] \tag{10}$$

Based on (10) if an increase in inflation is expected, the exchange rate will appreciate. In other words, an expected inflation surprise leads to an appreciation. This

approach allows the central bank to capture the effects of changes in expected inflation. With an increase in expected inflation, investors believe the central bank will react by raising interest rates. Higher real interest rates strengthen the currency. Given the short frequency in the data, the effects of inflation may not surface. Portfolio investors stand prepared to move investments in and out of countries on short notice and a regular basis.

In the case of the government balance, a government surplus indicates economic security creating a favorable outlook for investors. As a result, an increase in the government surplus suggests a positive immediate response of portfolio investment. A government deficit would signal pressure to increase the money supply to finance deficit, suggesting inflation, currency depreciation, and a negative response of portfolio investment.

However, at the same time an increase in the government surplus suggests a positive response of inflation as shown in Figure 5. An increase in government surplus suggests a decrease in inflationary pressure. It should be noted that there is a small change in inflation due to a government surplus shock indicating that the government budget has little or no effect on inflation.

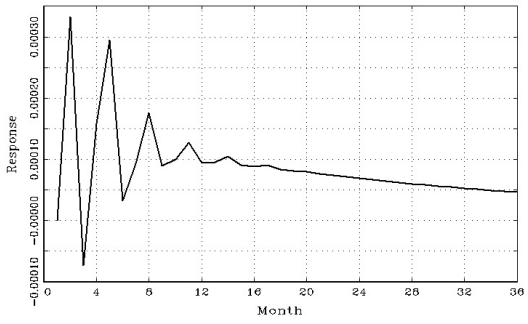

Figure 5: Impulse response of inflation to one standard deviation government surplus shock

3.6 Generalized Impulse Response Analysis

In contrast to impulse response functions for the SVAR system, generalized impulse response functions do not require a specific ordering of variables. In this thesis, generalized impulse response functions in Figure 6 appear to be qualitatively identical to those from impulse response functions suggesting the robustness of the ordering in the present study.

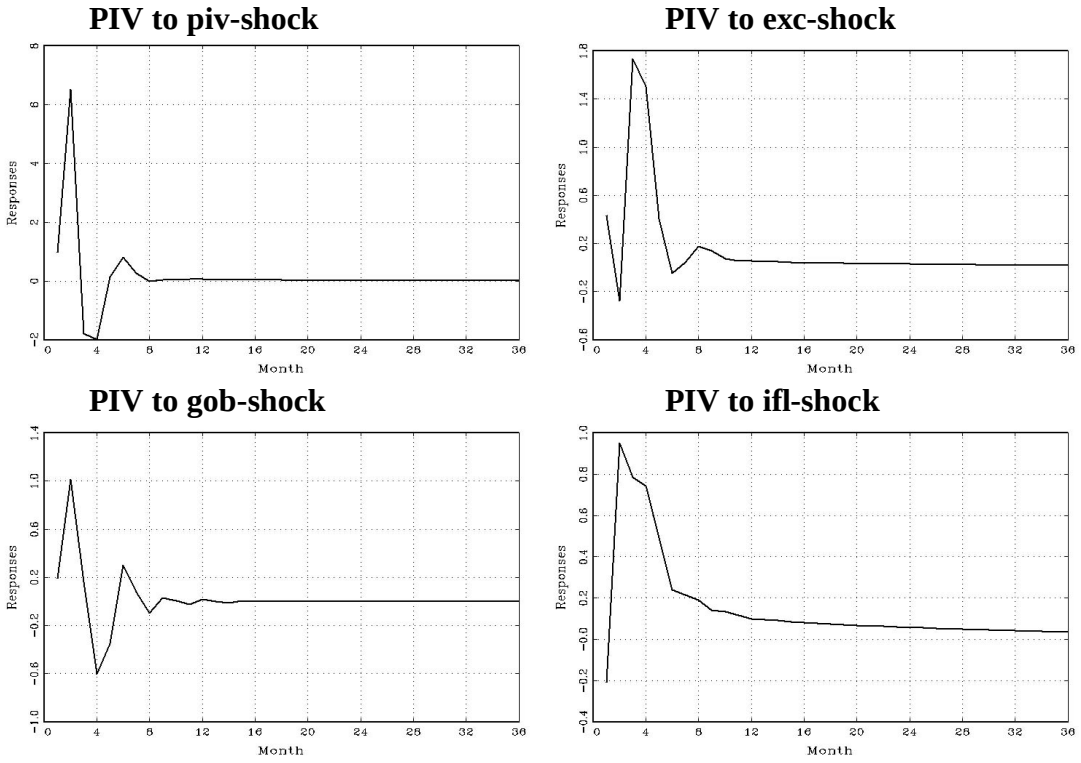

Figure 6: Generalized impulse response of portfolio investment to one standard deviation shock

3.7 Variance Decomposition

Variance decomposition is utilized to examine the importance of other factors to explain PIV and the proportion of the variability of PIV by those factors. Based on variance decompositions in Table 3, the government balance has a slight effect or no

effect on portfolio investment. Short term portfolio investment is mainly driven by portfolio investment itself, and the effect gradually decreases and vanishes in two years. There is no immediate effect from inflation or the exchange rate. However, the effect of both inflation and the exchange rate on portfolio investment gradually increases. Portfolio investment is weakly affected by the exchange rate, but strongly affected by inflation in medium term.

Table 4: Variance decomposition of the Portfolio Investment (%)

Horizon	*EXC*	*IFL*	*GOB*	*PIV*
1	0.007	0	0.039	0.955
6	0.003	0.082	0.144	0.771
12	0.199	0.613	0.061	0.126
24	0.188	0.738	0.015	0.06
36	0.187	0.739	0.014	0.06
48	0.187	0.739	0.014	0.06

3.8 Inflation Targeting (2000-2006)

By imposing the same restrictions and identification of models, a VAR(2) model is estimated using the data during inflation targeting regime ranging from 2000:5-2006:11.

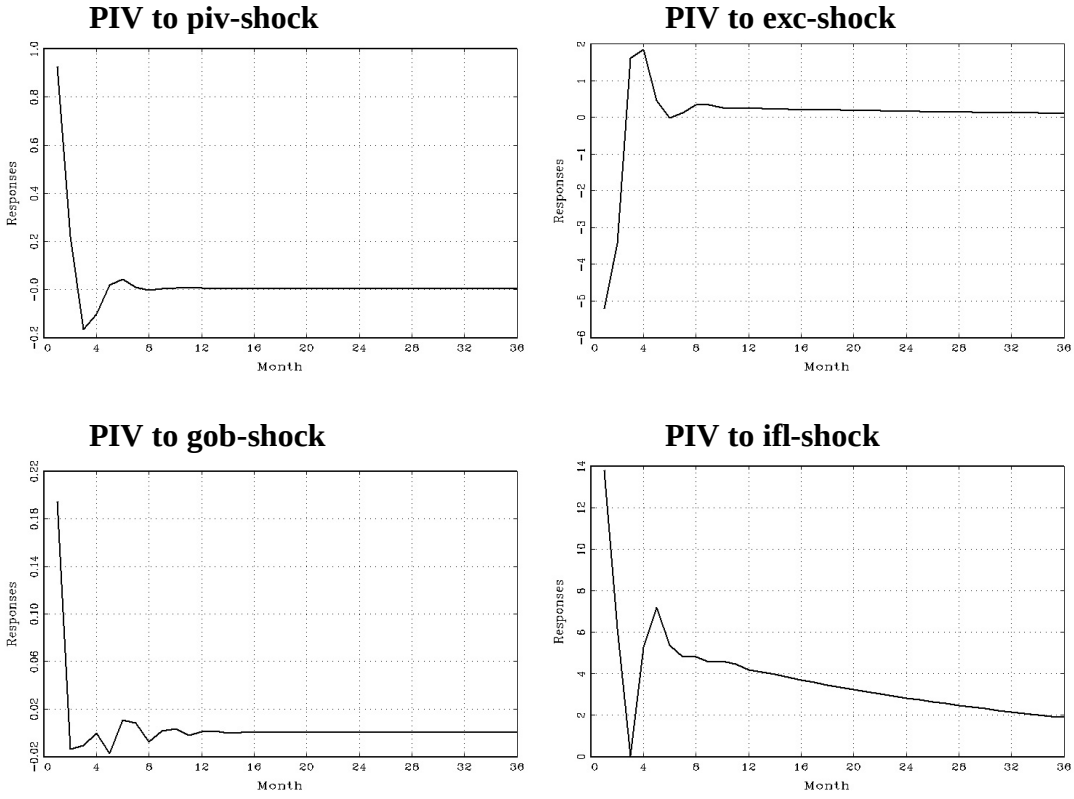

Figure 7: Impulse response of portfolio investment to one standard deviation shock, 2000-2006

Impulse response functions of this subsample analysis are shown in Figure 7. As expected, only short-term impacts are observed. However, the response from portfolio investment due to an inflation shock appears to be persistent over 36 periods. A portfolio investment has an immediate positive impact on portfolio investment. An expected depreciation makes investments in baht less desirable and results in a decrease in portfolio investment. With an expected depreciation, the baht loses its value creating

capital lose in holding the baht. Portfolio investment drops as a result. An increase in government surplus shows a healthier economy boosting confidence of foreign investors and results in an increase in portfolio investment. An increase in an expected inflation results in an anti-inflationary action by central bank to offset an increase in inflation. Central bank will react by increase interest rate causing inflow of portfolio investment.

Table 5: Variance decomposition of the Portfolio Investment (%)

Horizon	*EXC*	*IFL*	*GOB*	*PIV*
1	0.101	0.012	0.033	0.854
6	0	0.494	0.028	0.477
12	0.171	0.804	0.001	0.024
24	0.165	0.816	0	0.018
36	0.165	0.817	0	0.018
48	0.165	0.817	0	0.018

Variance decomposition of subsample shows that in a short run portfolio investment is driven by itself and the effect gradually decreases in 2 years. Over time portfolio investment is strongly affected by inflation in medium term. Government surplus and exchange have slight or no impact on portfolio investment. The VAR(2) process using subsample are qualitatively similar to that of the period 1997:1-2006-11 indicating the robustness of the model.

IV. CONCLUSION

The VAR analysis conducted in the present thesis attempts to explain the effects of central bank action on portfolio investment using monetary and fiscal variables in Thailand.

Portfolio investment appears to be stationary in levels, which implies there would only be a short term dynamic effect on portfolio investment that converges to its unconditional mean.

Impulse response analysis shows that inflation has a persistent effect on portfolio investment whereas the exchange rate, portfolio investment, and the government budget effects last only for eight months. Variance decomposition analysis shows that only the government budget has a short term impact on portfolio investment.

Expected inflation contributes positively to portfolio investment through the anticipation of central bank action targeting inflation. Because the central bank would lower the discount rate charged commercial banks in the face of expected inflation, interest rates and the inflation rate tend to be inversely related. Reactions of the central bank to raise or lower interest rates become more transparent under inflation targeting. Investors know what the central bank considers the target inflation rate and therefore anticipate interest rate changes in their investment choices. An inflation targeting

strategy appears to have a positive impact on the short term inflow of portfolio investment by creating confidence among portfolio investors.

Assuming an increase in inflation is expected, the central bank can increase the current interest rate creating an inflow in portfolio investment. An increase in inflation, in turn may not take place due to anti-inflationary central bank action. Moreover, maintaining the government budget displays economic security and results in boosted confidence of investors as shown by an increase in portfolio investment.

In summary, the present thesis suggests inflation targeting has been rational central bank policy for Thailand.

REFERENCES

Black, T. and S. Black (1999) "Reform of Global Financial Architecture: Lesson from Thailand," *Thailand Agenda* 6, 261-270.

Broome, Simon and Bruce Morley (2004) "Stock prices as a leading indicator of the East Asian financial crisis," *Journal of Asian Economics* 15, 189-197.

Fernández-Izquierdo, Ángeles and Juan Angel Lafuente (2004) "International transmission of stock exchange volatility: Empirical evidence from the Asian crisis," *Global Finance Journal* 15, 125-137.

Fleming, John M.(1962) "Domestic Financial Policies Under Fixed and Under Floating Exchange Rates," Staff Papers, *International Monetary Fund* 9, 369-79.

Allsopp, Louise and Ralf Zurbruegg (2004) "Purchasing power parity and the impact of the East Asian currency crisis," *Journal of Asian Economics* 15, 739-758.

Haggard, Stephan (2000) *The Political Economy of the Asian Financial Crisis,* Institute for International Economics.

Hall**,** Alastair (1994) “Testing for a Unit Root in Time Series with Pretest Data-Based Model Selection,” *Journal of Business & Economic Statistics* 12, 461-470.

Holden, Ken, John Thompson and Yuphin Ruangrit (2005) “The Asian crisis and calendar effects on stock returns in Thailand,” *European Journal of Operational Research* 163, 242-252.

IMF (1998) *IMF's World Economic Outlook*, May.

McKinnon, Ronald I. (1973) *Money and Capital in Economic Development*, Brookings Institute.

Ng, Serena and Pierre Perron (2001) “Lag Length Selection and the Construction of Unit Root Tests with Good Size and Power,” *Econometrica* 69, 1519-1554.

Pindyck, Robert S. and Daniel L. Rubinfeld (1998) *Econometric Models and Economic Forecasts*, 4th ed, McGraw-Hill.

Piontkivsky, R., A. Bakun, M. Kryshko, and T. Sytnyk (2001) “The impact of the budget deficit on inflation in Ukraine,” *Research Report*, May.

Sargent, Thomas and Neil Wallace (1981) “Some Unpleasant Monetarist Arithmetic,” *Federal Reserve Bank of Minneapolis Quarterly Review*, Fall.

Shaw, Edward S. (1973) *Financial Deepening in Economic Development*, Oxford University Press.

Sims, Christopher A. (1980) “Macroeconomics and Reality,” *Econometrica*. 48, 1-48.