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An Analysis of Thailand's Net Capital Inflows Surges After the 1997 Crises

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The paper analyses the nature, the determinants, and the impacts of net capital inflows surging in Thailand after the 1997 currency and financial crises. After the crises, the composition of the net capital inflows was changed from the ones dominated by short-term flows to direct foreign investment. However, in recent years, huge net inflows of short-term loans and portfolio investment have returned. While direct foreign investment found mostly in the manufacturing export sector gains from real depreciation of domestic currency, short-term loans and foreign investment in debt and equity were attracted by real exchange rate appreciation together with high returns on investing in Thailand as well as in the emerging Asian region as a whole. As a result of the surge of total net capital inflows, asset prices increased somewhat, foreign reserves grew rapidly as domestic currency appreciated both in nominal and real terms. The study suggests policies which seek to balance the impacts of capital inflows on real exchange rates and the accumulation of foreign reserves. An attempt should also be made to allow for capital to flow out more freely mitigating the adverse effects of the net capital inflow surges.

Keywords: Foreign capital flows, exchange rates, asset prices, Thailand.

Thailand has completed its capital account liberalization in the early 1990s. Immediately after its opening up, a huge amount of foreign capital flowed into the country but most of the inflows were in the form of foreign borrowing invested in the non-tradeable sector. Once the sector and the economy slowed down together with a rising inflation in 1996, the short-term loans ceased to be rolled over and in mid-1997, most inflows eventually dried up along with the collapse of the country's fixed exchange rate system. With this, the twin crises of both the domestic currency and the financial sector began. Both crises sent the country into a deep recession in the following year, and it did not recover until 1999.

After the crises, the country continued to maintain the opened capital account, although it learned the lesson first-hand that capital inflows have their benefits and costs. From these lessons, both the macroeconomic policies and financial sector have undergone some reforms to better insulate the country from future crisis. For example, local-currency-denominated bonds are issued to reduce the problem of currency mismatch, which was a cause of the 1997 crises. Some forms of economic and financial surveillance system, including the derivative and debt markets, were also established to reduce the financial sector risk. As the country continued to open up, a large amount of foreign capital occasionally flowed into Thailand, particularly when the domestic politico-economic conditions were favourable and waves of foreign capital flowed into the rapidly growing East Asian region, resulting in some of the inflows spilling over to the country. These inflows had often created pressures on the appreciation of the domestic currency and this in turn hurt the export sector. The central bank had done its best to mitigate the adverse effects, but was usually reluctant to impose any drastic actions to stem the inflows. More often than not, foreign capital was allowed to move relatively freely in and out of the country as the overall economic policy had still been leaning towards openness.

Nevertheless, a time came in December 2006 when it could not resist the temptation to try a minor form of capital control measure to prevent the resulting appreciation from harming the exports. The impulse was the plunge of the capital inflows of all types before the total flows returned a few months later. In light of the response, the measure was abolished over a year later. In 2010, when there was another surge of short-term capital flowing into the country, the government intervened by imposing a measure to reduce the inflows again, this time by tax measures, out of the concern of the impact of the inflows on the exchange rates and other asset prices. Other than these short-term or mild forms of capital control, the capital account in Thailand remains relatively open.

Under the above policy environment, this paper sets to study the nature, the determinants, and the impacts of net foreign capital inflows into Thailand classified by type of the inflows. The objectives are to find out how the size, the composition, and the nature of the net capital inflows in Thailand have changed after the 1997 crises. How have patterns of the net inflows been altered for the country to insulate better from the risk of capital inflows reversals? What are factors attracting occasional surges of net capital inflows into the country? Ultimately, how have the net inflows affected the country's real exchange rates and the prices of other kinds of assets? Given all the findings, what kind of policy implications one can draw on capital flows management.

The paper is organized as follows. In the following first section we describe the development of the Thai economy under the changing world economic conditions after the period Thailand liberalizing its capital account in the early 1990s. The discussion puts an emphasis on the country's changing political economic conditions. This is because since the year 2000, there has been a significant change in Thailand's political scene and it has influenced economic policies and environment in which foreign capital flows in and out of the country. Section II describes the changes in the size and composition of net capital inflows by type against the economic background discussed in the last section. In addition, some statistical indicators are computed to identify the nature of different types of the inflows in terms of their persistency, volatility, and predictability. Section III finds out the determinants of different capital inflows to understand why different types of foreign capital flow into Thailand at different times. Section IV simulates the impact of the surge of net inflows on the domestic exchange rates and various asset prices. Finally section V concludes the findings and draws policy implications.

I. The Thai Economy after the 1997 Financial Crisis

Before the currency and the financial crises in 1997, Thailand had enjoyed relatively high growth

with moderate inflation rates. In the decade after the mid-1980s in particular, the country was at its peak of the boom times. The average annual growth rate was well over 8 per cent with double-digit growth rates for three consecutive years in the late 1980s. During the time, the country benefited from the stable world economy together with the market-friendly domestic policy of open foreign trade and direct foreign investment. Exports grew at very high rates for many successive years and direct foreign investment increased sustainably in accordance with the expanded trade. After several years of rapid growth, the government decided early in the 1990s that it was ready to extend the opening up to include all types of capital inflows other than the direct foreign investment.

The immediate effect was the surge of total foreign capital inflows. Foreign investors heavily invested in Thailand to benefit from the spectacular GDP growth, high domestic interest rates, and the absence of foreign exchange risk exposure under the country's essentially fixed exchange rate system. However, among all types of capital flows, the ones that increased the most during the time were short-term loans and speculative portfolio investment. These inflows were later shown to be easily reversible once the country faced a threat of an economic adversity. Table 1 shows that as it actually turned out, the current account deficits to GDP which had persistently increased for several years in the mid-1990s reached the height of 8 per cent of GDP in 1996. Later in the year, inflation also climbed up quickly while exports and real GDP growth suddenly dropped. As a result, the economic outlook became bleak and huge amount of foreign capital, particularly short-term loans, flowed out of the country in a short time. After that, the timing was ripe for the Thai currency to be attacked. Thailand's central bank tried its best to defend the fixed exchange rates but it did not succeed. Eventually, the domestic currency of Thai baht was allowed to float under the manage float system. Immediately after the collapse of the fixed exchange rates, the Thai baht depreciated exorbitantly on a continuous basis. This prompted the foreign debt of financial institutions and corporations which were dominated in the U.S. dollar to mount rapidly in terms of local currency. Most went bankrupt for the inability to service the debt. This was followed by the credit crunch and the country fell into the most severe recession in half a century.

As the crisis worsened and the Thai baht kept on plunging, huge amounts of capital kept flowing out. Apart from payment for huge foreign debt, there was a capital flight by domestic and foreign investors alike. Meanwhile, real GDP growth continued to decline and unemployment rapidly soared to form a full-blown crisis. Shortly after the crises, the government had to seek the assistance from the IMF and adopt the conditionality that came with loan obligations.

In the subsequent two years, the Thai economy had to suffer a deep recession with the domestic currency on the depreciating trend. In the crisis year of 1997, real GDP declined at 1.4 per cent and in 1998, it hit the bottom of negative 10.5 per cent.[1] In fact, it was not until early 1999 that the economy was able to sustainably recover and the real GDP began to grow at about 4.5 per cent at the end of the year.[2] Moreover, during 1999 to 2000, the budget deficits declined and the current account had since turned into a surplus in almost every year in the next decade.

As the economy started to recover, there was a change in the government in 2001 and Thaksin Shinawatra became the Prime Minister for the next six years. He initiated a new economic policy package with emphasis on economic stimulation and income transfer to the lower income group to secure the votes of the majority of the population.[3] The government increased spending and provided subsidies on living cost financed by both the government budget and the off-budget source. The government also kept the interest rates low to favour the business sector while at the same time stimulating economic growth. These policies were effective in boosting the economy in the first four years of his term under the favourable world economic environment of sustainable growth, low interest rates, and a moderate increase in oil prices. Both exports and domestic consumption

TABLE 1
Macroeconomic Indicators of Thailand and Growth of the World Economy, 1990–2010

	Growth of Real GDP of			*Headline*	*Government Budget*	*CAB*	*Reserves to*	*Policy*	*RER*
	World	*Emerging Asia*	*Thailand*	*Inflation*	*Balance per GDP*	*Per GDP*	*Short term Debt*	*Interest Rate*	
1990	3.22	5.40	11.62		4.89	–8.30	137.00	11.59	29.78
1991	2.21	6.07	8.11	5.77	4.30	–7.50	119.70	10.09	29.29
1992	2.21	8.87	8.08	4.05	2.57	–5.40	112.00	5.88	28.84
1993	2.12	8.91	8.25	3.38	1.89	–4.80	112.40	5.73	28.65
1994	3.40	9.29	8.99	5.07	2.69	–5.40	103.80	7.07	27.80
1995	3.28	8.87	9.24	5.76	3.01	–7.80	70.70	9.95	26.75
1996	3.76	8.36	5.90	5.74	0.94	–7.90	81.10	8.98	26.47
1997	4.28	7.77	–1.37	5.71	–1.50	–2.00	70.40	14.87	31.74
1998	2.56	3.41	–10.51	8.04	–2.79	12.70	103.90	13.79	39.36
1999	3.49	5.37	4.45	0.24	–3.33	10.20	178.00	2.08	36.67
2000	4.78	6.67	4.75	1.58	–2.23	7.60	222.30	1.49	39.58
2001	2.28	5.74	2.17	1.68	–2.40	4.40	246.80	2.06	44.36
2002	2.87	6.86	5.32	0.59	–1.41	3.60	326.60	1.96	43.27
2003	3.63	8.13	7.14	1.87	0.40	3.30	386.53	1.46	41.98
2004	4.92	8.64	6.34	2.76	0.13	1.70	261.44	1.44	40.67
2005	4.57	9.48	4.61	4.47	–0.64	–4.30	225.80	2.79	40.22
2006	5.24	10.38	5.09	4.71	1.12	1.10	245.80	4.79	37.37
2007	5.40	11.41	5.04	2.25	–1.69	5.70	257.10	3.69	34.24
2008	2.87	7.67	2.48	5.40	–1.06	0.60	330.30	3.40	32.56
2009	–0.52	7.21	–2.33	–0.85	–4.44	8.20	417.80	1.35	33.68
2010	5.01	9.53	7.80	3.31	–2.63	10.15	368.22	1.50	30.62

NOTE: CAB denotes current account balance and RER denotes real exchange rate of the Thai baht per U.S. dollar.
SOURCE: IMF and the Bank of Thailand.

were able to grow satisfactorily and led to increased real GDP growth of 6 per cent on average. In turn, the steady growth during the period made it possible for the government to collect increased tax revenue to finance its increasing expenditures. In fact, from 2001 to 2004, as the world economy grew steadily from 2.3 to 4.9 per cent and the baht was depreciating to a stable rate of about 40 baht per dollar, Thailand's exports were able to grow over 17 per cent a year and the real GDP grew from 2.2 per cent in 2001 to the peak of 7.1 per cent in 2004 without any visible tension on the government budget balance. Besides, the steady export growth enabled Thailand to repay most of its external debt and as a result foreign capital started flowing into the country once again.

Signs of economic and political uncertainty emerged after Thaksin entered his second term of his administration in 2005. Despite his continuing popularity among the low income population, his political rivals and most middle-income urban population became increasingly critical of his economic policies. While his policies might be able to generate high real GDP growth with part of the increased incomes transferred to the low income group, these benefits were doubted to be long lasting. Besides, there was a risk of how to finance the increasing government spending in the long term. Unless the government could turn the short-term growth policy into policy aimed at long-term growth, his policies would not only be impossible to be sustained but the country might also fall into high debt in the future.

Apart from the criticism on his economic policies, his opponents also had much doubt on the integrity of his administration. His opponents took to the streets to attack his alleged conflict of interest and corruption implicit in his economic policies. With another major incident of political unrest in southern Thailand in early 2005, his government stability was visibly shaken. The insurgency in the South became increasingly severe and violence was escalating without much that the government could do to turn the incident back to normal. As a result of all these unfortunate incidents, the Thai economy started to slow down from 6.3 per cent of real GDP growth in 2004 to only 4.6 per cent in 2005 before increasing to 5.1 per cent in 2006. The economic slowdown took place despite the government's continuing expansionary policy. In fact, without the support of sustaining high export growth and increased foreign investment due to the favourable world economy with an annual growth of almost 5 per cent a year, the real GDP growth of Thailand could have been lower during 2005 to 2006.

Before it was able to prove whether Thaksin's policies could have brought sustainable growth and more equal income distribution in the long term, his administration was terminated by a military coup in September 2006. Unfortunately, the coup could not do much to stabilize Thailand's political condition by integrating the divided political groups in the country. Although the coup was able to throw out the government, it could not reduce Thaksin's popularity in the rural sector and among the low-income urban population. The military administration held the office to the end of 2007 before calling for another general election. On managing the economy during the period, the government reduced its spending and kept the interest rates high to keep inflation at the low targeted rate. Despite its conservative policy, the economy was able to maintain the real income growth of over 5 per cent during its term as exports grew at favourable rate of over 20 per cent per year under the rapidly growing world economy led by the high growth of major emerging markets, particularly in China and India.

There was a major economic problem the coup government had faced since the mid-2006 and it was the persistent surge of foreign investment speculating on the appreciation of currencies in most of the Asian emerging markets. Thailand, with relatively high interest rates, became one of the emerging economies that received large foreign investment, particularly in the debt market. The government, concerned about capital inflows driving up the value of the Thai currency and asset prices, responded to the surge by implementing a surprise capital control measure in late 2006. The purpose was to discourage the short-term inflows, speculating on the appreciation of the Thai baht

and thereby hurting the Thai exporters. The measure was to require foreign investors to deposit 30 per cent of their foreign currency inflows in interest-free accounts with the Bank of Thailand for 12 months.[4] The measure proved to be unpopular among all investors and it was finally abolished in 2008.

After the general election in 2008, Thailand changed governments three times all within a year, and the political uncertainty persisted.[5] From 2009 to 2010, there were occasional violent street protests by Thaksin's supporters and the country thus became unfavourably perceived as a politically unstable economy. When combined with the financial crisis in the United States in late 2008 and also in some other developed countries in the following years, the Thai economy registered the lowest growth rate in the East Asian region for the consecutive years of 2007 to 2009. The growth of real GDP in the 2008 was reduced from the previous years of 5 per cent to 2.5 per cent, and in 2009 it was reduced further to a negative rate of 2.3 per cent. In fact, the growth rate of 2009 was the lowest in the decade after the 1997 crisis and the country was on the verge of being thrown into a deflation. The macroeconomic policy during 2009 to 2010 was to lift the economy out of the recession by increasing the government spending in combination with reducing the interest rates. Evidently, the government budget deficit was increased to 4.4 per cent of GDP in 2009 and 2.6 per cent in 2010. The interest rates were reduced from 3.3 per cent in 2008 to a mere 1.2 per cent throughout 2009 to 2010. All of these expansionary policies were for stimulating economic growth and reducing unemployment.

In 2010, as the world economy bottomed out from the deep recession of 2009, the Thai economy was fortunately able to increase the growth rate again to 7.8 per cent. However, since early 2010, there has been another wave of capital inflows surge into many emerging markets following the monetary stimulation policy in the United States. Thailand was again among the recipient countries that obtained huge capital inflows, mostly in the form of portfolio and foreign loan investment. Consequently, the concern over the impacts of the surge of capital inflows on asset prices has returned. For starters, in response to the inflows in 2010, the Thai economy saw a steady nominal appreciation of the Thai baht from 33 baht per dollar in January to 30 baht per dollar in December. In real terms, the baht appreciated at almost 11 per cent in just a single year. The impact prompted the government to abolish the withholding tax exemption for foreign portfolio investors in late 2010 for fear that further capital inflows would appreciate the prices of other assets. In light of the recent wave of capital inflows surge to Thailand, it is useful to be able to discover the size of the effects of net capital inflows on the country's currency and asset prices, and what policy options are available to manage the foreign capital inflows. Before analysing the impact of the surge of foreign capital though, we study the change in the pattern of the inflows and factors driving them into the country.

II. Trends and Nature of Net Capital Inflows

Thailand has opened up the capital account especially for attracting direct foreign investment by providing various privileges and incentives for investors since the establishment of the Board of Investment (BOI) in 1960. However, a jump in capital inflows did not happen until the early 1990s when the government extended the capital account liberalization to include all other types of foreign investment. Table 2 shows the size of net private capital inflows to Thailand from 1993 to 2010 with the flows classified by type namely direct foreign investment, foreign portfolio investment divided into equity and bond investments, long-term loans, and short-term loans consisting of commercial bank loans, trade credit, and other kinds of short-term debt. The table shows that after Thailand opened up its capital and financial account in the early 1990s, the country saw three waves of net capital inflows surges. The first was during 1993 to 1996 just before the 1997 currency and financial crises. The second was during 2005 to 2007 when the world economy and the emerging markets in Asia were rapidly

TABLE 2
Net Private Capital Flows by Type during 1993–2010
(In US$ million)

Period	*TKF*	*FDI*	*FPIE*	*FPID*	*LTL*	*STL*
1993–96	72,431	7,584	5,670	10,300	1,045	47,832
1997–98	–20,271	11,374	4,252	699	–6,357	–30,239
1999–2001	–17,564	14,501	2,194	–3,380	–11,945	–18,934
2002–04	10,028	14,432	3,664	–1,626	–6,662	220
2005–07	55,756	28,838	14,577	1,034	3,213	8,094
2008–09	7,599	13,515	–2,429	2,287	–1,197	–4,577
2010	33,428	19,293	1,051	6,893	–891	7,082

NOTE: TKF denotes total net capital inflows, FDI net foreign direct investment, FPIE net foreign portfolio investment in equity, FPID net foreign portfolio investment in debt investments, LTL net long-term loans, and STL net short-term loans.
SOURCE: Bank of Thailand.

growing. The last started in 2010 when the global economy was flooded with liquidity and the emerging markets resumed their rapid growth after the OECD countries began to recover for the first time since the 2007 financial crisis. A more detailed discussion of each wave of the net capital inflows surge in Thailand is provided below.

During the first wave of large capital inflows in the early 1990s, the net inflows increased enormously to the peak in 1995, following the policy of allowing commercial banks to borrow freely in the international financial market. After the financial liberalization, net capital inflows increased three times from 1990 to 1995, but most of them were invested in non-tradeable assets that had created bubbles that burst to set forth the twin crises in mid-1997.[6] After the crises, net foreign capital turned negative yearly all through 2001. Although some regular amount of direct foreign investment and some portfolio investment were still forthcoming to invest in the manufactured export sector after the crises, huge amounts of capital were flowing out in the form of payments on short-term and long-term foreign debts, including capital flight of investors from all over the world. This led net capital inflows to become a huge deficit, especially in 1997 and 1998. After the economy started to recover from 1999 to 2001, the outflows to pay for the foreign debt steadily declined but the huge amount of the outflows was still much larger than the size of the net inflows of direct foreign investment. Actually, it was not until 2002 when the net total capital inflows returned to a positive figure and slowly increased in the next few years.

In the second wave of capital inflows surges from 2002 to 2004, the Thai economy started to grow faster along with the high growth of emerging markets in the Asian region. Foreign capital inflows returned to Thailand mostly in form of direct foreign investment with some of equity investment, both invested in the manufacturing sector. From 2005 to 2007, while the Thai economy began to slow down due to the downside risk in both the political and social conditions, the world economy registered the highest growth in decades, which was attributed to the sustainably rapid growth in major emerging markets in China and India. Despite Thailand's declining growth rates, huge net foreign capital was attracted by the booming region and the inflows spilled over to the country, rendering an increase in foreign investment in all types of the assets. However, most increases were in the form

of direct foreign investment, portfolio investment, and short-term trade credit in the manufactured export sector with the investment in the financial services on the rise.[7] The investors were the traditional major investors in Thailand, namely Japan and Singapore with some from the EU and Hong Kong.[8]

From 2008 to 2009, net capital inflows in Thailand declined along with other emerging markets in response to the financial crisis in the developed countries which was later followed by a few years of trade collapse and recession in many parts of the world. Net capital inflows of all types, except for investment in Thai government bonds, declined with foreign equity investment and foreign short-term and long-term loans declining the most. Despite the fall of total net inflows, direct foreign investment remained the largest foreign investment in Thailand during this difficult period. Also, it should be noted that after 2008, while most foreign investment remained largely in the manufacturing sector, investment in financial services were drying up but investment in the real estate sector remained high despite declining somewhat.[9]

In the most recent surge of capital inflows in 2010 when the world economy was recovering from the deep recession, huge net capital inflows returned to Thailand again and they increased by five times the amount in 2009. Once again, along with the surge of total inflows, the types of the inflows that increased the most were short-term loans followed by foreign investment in domestic bonds and equity. In fact, it had become the first time since the 1997 crisis that the composition of the net inflows was predominated by short-term debt (with the share of direct foreign investment falling), similar to the condition in the 1990s just before the crisis. When combining with the observation that foreign investment in the real estate sector had increased in the recent years, it becomes a cause for concern whether the development of the flows of foreign investment in Thailand would be desirable for the country's economic stability.

From all the episodes of net capital inflows surge, either short-term loans or portfolio foreign investment grew the most. During the ebbing tide of capital flows during the financial crises in Thailand from 1997 to 1999 or in the OECD economies during 2008 to 2009, the types of foreign capital that flowed out the most rapidly were also either short-term loans or portfolio investment. Apparently, capital inflows of different types have different degree of volatility and sustainability. For our purposes, we will use selected statistical indicators to discover the nature of different types of the net capital inflows in terms of their persistency, volatility, and predictability. The types of flows with high degree of persistence, low volatility, and easy to predict the future flows would be labelled as "cool money". On the contrary, the types of flows which are easily reversible, very unstable, and difficult to predict would be called "hot money". After identifying the nature of these different types of the inflows, we will be able to conclude whether the change in the size and the composition of the total net inflows could lead to a concern on the impact of the inflows.

In examining the nature of different types of net capital inflows in Thailand, we apply the revised database of the Bank of Thailand to the methods used in the studies of Claessense, Dooley, and Warner (1995), Chuhan, Perez-Quiros, and Popper (1996), Wiboonchutikula et al. (2001), Becker and Noone (2009), and IMF (2011). The revised database separates net foreign capital inflows from net capital outflows of Thai residents, and foreign equity from debt investment. We use available monthly data from 1993 to 2010 to compute autocorrelation functions to examine the persistency of different types of the net inflows. We compute the conditional variance coefficients of different types of flows to distinguish their degree of volatility. Finally, we compute the Theil inequality coefficients to gauge the predictability of each type of the net inflows.

Table 3 shows the autocorrelation coefficients by type together with the Q-statistic.[10] Before the 1997 crisis, Wiboonchutikula et al. (2001) finds that all of the net inflows were not persistent. After the country recovered from the crisis and returned to the relatively normal conditions in the period of 1999 to 2010, it is shown in Table 3 that most

TABLE 3
Autocorrelations for Private Capital Flows by Type

Lag	*TNK*	*FDI*	*FPIE*	*FPID*	*LTL*	*STL*
1	0.411	0.339	0.059	0.602	0.154	0.160
2	0.082	0.436	–0.176	0.151	0.008	–0.007
3	0.068	0.276	–0.066	–0.061	0.302	–0.023
4	–0.132	0.309	–0.156	–0.120	0.113	–0.025
5	–0.127	0.358	–0.032	–0.194	0.077	0.076
6	0.104	0.208	0.110	–2.284	0.267	–0.140
7	0.271	0.435	0.114	–0.180	0.177	0.005
8	0.175	0.202	0.021	0.045	–0.004	–0.000
9	0.211	0.267	–0.052	0.099	0.220	0.011
10	0.125	0.211	0.003	–0.033	0.195	0.007
11	0.001	0.294	–0.167	–0.185	0.147	0.005
12	0.175	0.288	0.129	–0.138	0.167	0.191
13	0.127	0.288	0.081	0.019	0.051	0.051
14	0.010	0.221	0.059	0.061	–0.041	0.027
15	0.106	0.214	0.057	0.028	0.272	0.095
16	0.041	0.214	–0.128	–0.014	0.246	–0.092
17	–0.062	0.096	0.121	0.082	0.064	–0.103
18	0.011	0.147	0.119	0.106	0.062	–0.013
19	0.050	0.137	–0.205	0.057	0.133	0.068
20	0.057	0.113	0.050	0.025	0.069	0.159
21	0.159	0.040	–0.036	0.078	0.185	0.009
22	0.278	0.043	–0.058	0.202	0.190	–0.084
23	0.193	0.138	0.012	0.193	0.059	0.071
24	0.159	0.085	0.064	–0.014	0.053	0.021

SOURCE: Authors' own calculation using monthly data during 1999 to 2010 from the Bank of Thailand.

flows continued to have low persistence. Direct foreign investment was singled out as the only type of net capital inflows which was the most persistent. Both foreign portfolio equity and portfolio bonds were the least persistent followed by short-term loans.

On computing the conditional variance coefficients[11] to distinguish the degree of volatility of different types of the net capital inflows, we find from Table 4 that before the 1997 crises foreign, debt in all forms, namely bonds, short-term loans, and long-term loans, were the most volatile and foreign direct investment was the least volatile, followed by foreign equity investment. However, after recovery from the crises, all flows except for direct foreign investment was volatile; short-term debt fluctuated the most, followed by portfolio investment in the local bond market.

Table 5 shows the Theil inequality coefficients[12] computed for determining the predictability of each type of net capital inflows. For whichever periods, foreign investment in equity, bonds and all kinds of short-term loans were the most unpredictable, but direct foreign investment was the most predictable, consistent with its persistency and the least degree of volatility.

In our overall assessment, direct foreign investment in Thailand is found to be cool money

TABLE 4
Volatility Conditional Variance Coefficients of Net Capital Inflows by Type

Time Period	*TKF*	*FDI*	*FPIE*	*FPID*	*LTL*	*STL*
1993M1–2010M12	1.969	0.601	2.071	3.363	3.195	17.416
1993M1–1997M6	0.632	0.363	1.444	0.703	93.952	0.984
1999M1–2010M12	2.051	0.471	2.265	11.449	2.339	26.681

NOTE: The conditional variance coefficient, defined as the ratio of the standard deviation to the mean, is used to measure the degree of volatility of net capital inflows. In order for the measure to be defined only for non-zero mean, the absolute value for the mean is taken to ensure it is always positive.
SOURCE: Authors' own calculation.

TABLE 5
Theil's Inequality Coefficients of Net Capital Inflows by Type

Time Period	*TKF*	*FDI*	*FPIE*	*FPID*	*LTL*	*STL*
1993M1–2010M12	0.603	0.249	0.594	0.821	0.681	0.768
1993M1–1997M6	0.291	0.156	0.489	0.755	0.654	0.650
1999M1–2010M12	0.442	0.244	0.683	0.968	0.646	0.666

NOTE: The Theil inequality coefficient measures how well a time series of net capital inflows estimated by the ARIMA method compare to a corresponding time series of the actual values. The coefficient lies between zero and one, where zero indicates a perfect fit.
SOURCE: Authors' own calculation.

that posits the least risk of capital inflow reversals. Oppositely, portfolio investment, particularly in bonds, equity and any kind of short-term flows, are hot money and can increase as much as decrease in a huge amount during a short period of time. Before the 1997 crises, there was the first wave of capital inflows surge to gain from Thailand's high interest rates and high returns in the equity and real estate markets with the absence of foreign exchange risk under the country's fixed exchange rates. The amount of net capital inflows was large and the composition was skewed towards short-term borrowing. The inflows during the time could be labelled as hot money which was highly unstable. After Thailand recovered from the crisis, the structure of net capital inflows was completely changed. From 1999 to 2009, most net inflows were in the form of direct foreign investment, which were more difficult to be reversible. But in 2010, the huge net inflows of short-term debt and foreign investment in domestic bonds had returned. We will now find out which factors determine the surges and how much they make an impact on the various asset prices.

III. Determinants of Net Capital Inflows

To study the determinants of capital inflows, we examine both pull and push factors that led foreign capital to flow into Thailand. Foreign capital flows are very fluid and can easily flow across countries

in search of a high return. Countries with high growth, high interest rates, high asset returns but short of savings will attract huge net capital inflows. On the other hand, countries with low growth, low interest rates, low asset returns but having a capital surplus will have the incentives to invest abroad to gain from a high yield. In our study, we will specify the determinants of net capital inflows based on the above concept. However, we recognize that there are many types of capital flows and the determinants of each type could be different. So, we first find the determinants of total net capital inflows and subsequently find the determinants of each of the components of total net inflows to distinguish the determinants.[13]

We postulate the following hypotheses. Direct foreign investment is attracted by the host country's high growth, openness policy, and exchange rates which are conducive to greater returns on investment, mostly in the export-oriented sector. Besides, the investment also depends on the world and regional markets which are represented by growth of the OECD and the Asian emerging market economies. Foreign portfolio investment responds to the returns on investment in equity and bonds, the growth differential between the developed economies and Thailand or the Asian emerging markets. Both short-term and long-term foreign loans increase as the domestic economy has good prospects for growth and increased investments in the goods and the asset markets, interest rates differential, and trends of exchange rate appreciation. Nevertheless, all types of inflows vary directly with world liquidity but vary inversely with global risk factors.

In assessing the influence of each factor on each type of foreign capital inflows, we use the cointegration method and quarterly data from 1999 to 2010 to find the long-run relationship between each type of the flows per GDP and factors that significantly influence it. We firstly test for the stationarity of all the net capital inflows data and data of variables which are factors determining them,[14] then employ both the Engle and Granger (1987) based test to identify the cointegrating estimation models.[15]

The estimation results are shown in Table 6. During 1999 to 2010, with Thailand recovering from the currency and financial crises, the overall net capital inflows to the country were determined by growth performance of the Asian region, the returns on investing in Thailand, and the efforts to avoid the investment risks. The estimation results show that while differences in the growth rates between the Asian emerging markets and OECD countries significantly affected Thailand's total net inflows, the coefficient of the differential growth rates between Thailand and the OECD was not significant. This implies that the overall inflows were attracted more by the growth performance of the region rather than that of Thailand alone. However, the rates of returns on investment in the Thai assets have a significant impact on the surge of capital inflows. The results show that high interest rates in Thailand relative to the world rates and high rate of returns on investment in the equity market both significantly determined the net capital flows. Finally, an increase in the risk of portfolio investment in the global market also reduces the total net capital inflows into Thailand.

When we find the determinants of the net inflows classified by type of investment, we find that different types are determined by different factors. Foreign direct investment in Thailand engaged in production of goods and services mostly for exports with only a fraction for sale in the domestic market. Investment in Thailand increased if the country maintained its export promotion policy with exchange rates depreciating in real terms and the risk appetite of investment in the rest of the world increased.

The foreign equity investment was significantly attracted by the high growth of the whole region of the Asian emerging markets. The returns in Thailand's stock market and the rate of real appreciation of the local currency also show positive impacts on an increased foreign portfolio investment in the Thai equity market. On the contrary, increases in domestic interest rates relative to the world rates drove the foreign equity investment away.

As for the foreign investment in the Thai bond markets, the estimation results show that

TABLE 6
Estimation Models of Determinants of Net Capital Inflows by Type

	TNKIF	*NFDI*	*NFPIE*	*NFPID*	*NLTL*	*NSTL*
CONSTANT	–124.3791	114.9046	42.3357	–462.6680	–281.3626	–485.4625
	(–0.1865)	(3.6132)	(0.1909)	(–4.8147)	(–1.4653)	(–0.7976)
GROWTH ASIA		0.7869	3.9388		3.7813	
		(0.4766)	(2.1667)		(2.2548)	
GROWTH OECD		–5.7438	–4.8883		–8.4767	
		(–1.3202)	(–1.0270)		(–1.5885)	
GROWTH THAI		–12.9798	40.9059		–48.3938	–211.9324
		(–0.2700)	(0.8603)		(–0.8721)	(–2.7169)
GROWTH ASIA-GROWTH OECD	13.4077			1.7535		
	(2.5317)			(3.0820)		
GROWTH THAI-GROWTH OECD	–16.1273			0.3820		
	(–1.0378)			(0.8558)		
RER CHANGE	–109.4526	153.5856	–166.3797	138.9442	42.2887	–546.2902
	(–0.4278)	(1.8248)	(–1.6675)	(1.4108)	(0.3529)	(–3.1075)
INTERBANK-FED	11.1698		–3.8116		3.2764	1.7948
	(1.8197)		(–2.4866)		(1.7792)	(0.2902)
BOND RETURNS				210.3413		
				(2.5630)		
STOCK RETURNS	99.5830		29.9010			71.3395
	(1.6563)		(1.8145)			(1.6783)
HOUSING PRICES	76.4893				46.0524	
	(0.7699)				(0.9117)	
WORLD LIQUIDITY	–45.7699		–10.3979	73.0230	5.4044	59.1670
	(–0.3606)		(–0.2891)	(4.5756)	(0.1792)	(0.6536)
OPENNESS		–0.3897				1.0406
		(–1.6426)				(2.0467)
BOND RETURNS* RER CHANGE				–4108.891		
				(–1.9012)		
VIX	–1.9871	–1.3513	–0.0567	–0.6434	–0.6769	–1.2691
	(–2.2438)	(–3.6158)	(–0.1052)	(–2.9353)	(–1.6290)	(–2.6530)
R-Square	0.6836	0.3019	0.4739	0.2954	0.5936	0.6779

NOTE: The table shows estimated parameters of each estimation model with *t*-statistics are given in parenthesis. RER denotes real exchange rates, and VIX is the Chicago Board of Options Exchange Volatility Index representing risk aversion. World liquidity is proxied by worldwide international reserves combined with the U.S. monetary base. Openness is measured by the share of total trade in GDP.
SOURCE: Authors' own calculation.

the investment which has actually increased in the recent years was attracted by the high growth gap between Asian emerging markets and the OECD economies, world liquidity, low risk aversion, and the interaction of the high bond returns with the rate of real appreciation of the Thai baht. This implies that it is not easy to manage capital inflows and exchange rates at the same time. When the authority intervened in the foreign exchange market to suppress the rate of appreciation, foreign reserves increased and the increase could cause a rise in the inflation rate. To avoid inflation, the authority sells bonds to sterilize the monetary base. However, the increases in the supply of domestic bonds raise the bond yields and this in turn attracts more capital inflows. Now, it becomes a full circle and that implies the need for the authority to engage in another round of foreign exchange market intervention together with sterilization efforts to prevent the baht from appreciation and inflation from rapidly rising. However, if the intervention and sterilization were not complete or fully effective, the local currency would partially appreciate anyhow with the foreign reserves further enlarging. If this phenomenon perpetuated the perception that the Thai baht were undervalued, the speculation on the appreciation of the domestic currency would continue. From our estimation results, the expected appreciation together with the high bond returns will be likely to draw renewed net capital inflows, inevitably increasing the difficulty of managing the capital inflows.

The private sector's borrowing of long-term loans has declined in the recent years but the estimation model shows that the borrowing will increase if the regional Asian growth increased and the gap of Thailand's interest rates relative to the world rates was widened. This implies that the long term loans in Thailand were more responsive to the regional growth and interest rate differentials during normal times than the recent period of more risky world economic conditions.

The net inflows of the bank and non-bank short-term loans were determined by the growth rates in Thailand, the openness policy, and the rate of real appreciation. Presumably, the bank's short-term loans were influenced by the rate of real appreciation. The net inflows of non-bank short-term loans in the form of trade credit, which surged in the recent years, relied on the favourable trade openness policy. But both the bank and the non-bank loans were found to increase if Thailand had a favourable economic growth.

In conclusion, we find that after Thailand recovered from the 1997 crises, foreign direct investment which involved production in the real sector was attracted mainly by the exchange rate policy that facilitates exports on world market. However, the rest of the net inflows which were found to be less stable or more volatile than the inflows of direct foreign investment depend on a different set of determining factors. Most importantly, as opposed to foreign direct investment, portfolio investment and the short-term flows were attracted by the domestic currency which is expected to appreciate in the real term. On the whole, there will be a surge in total net capital inflows into Thailand when risk aversion in the world decreases. In addition, the net inflows will increase when all the Asian emerging markets (not only the domestic economy) perform better than the OECD countries with performance measured by both growth of the economies and the rates of return on investment in the equity and bond markets.

IV. Impact of Foreign Capital Inflows

To analyse the effects of net foreign capital inflows on Thailand's asset prices and monetary variables which include exchange rates, stock prices, housing prices, foreign reserves, money supply, and inflation, we resort to the use of the VAR model.[16] The model introduced by Sims (1980) has the benefit of not having to rely on the ad hoc restrictions in order to distinguish the exogeneous from the endogeneous variables. In the simple VAR model, the estimates identify the structure of the economy where the endogeneous variables are specified in relation to their dynamic lag variables. In our study, we propose that a small

open economy with capital easily mobile across countries has the following structural form.

$$B_0 y_t = C_t + B_1 y_{t-1} + \ldots + B_k y_{t-k} + u_t$$

where y_t is an $m \times 1$ vector of endogeneous economic variables

C_t is an $m \times 1$ vector of constant intercept terms

B_i's are $m \times m$ matrices of structural parameters;
$i = 0,1, 2, \ldots, k$

u_t is an $m \times 1$ vector of structural disturbances

and there are k lags in the lag structure.

The above structural form needs to be transformed into the reduced form by multiplying both sides of the equations by B_0 and thus, we have the following equation.

$$y_t = B_0^{-1} C_t + B_0^{-1} B_1 y_{t-1} + \ldots + B_0^{-1} B_k y_{t-k} + B_0^{-1} u_t$$

If we let $A = B_0^{-1} C_t$, $A_i = B_{0-1} B_i$, $i = 1, 2, \ldots, k$, $e_t = B_0^{-1} u_t$, we can rewrite the above equation into the following form.

$$y_t = A + A_1 y_{t-1} + \ldots + A_k y_{t-k} + e_t$$

The above set of simultaneous equations is the VAR model with A_i's being the matrices of reduced form parameters and e_t the variance-covariance matrix of reduced form disturbances.

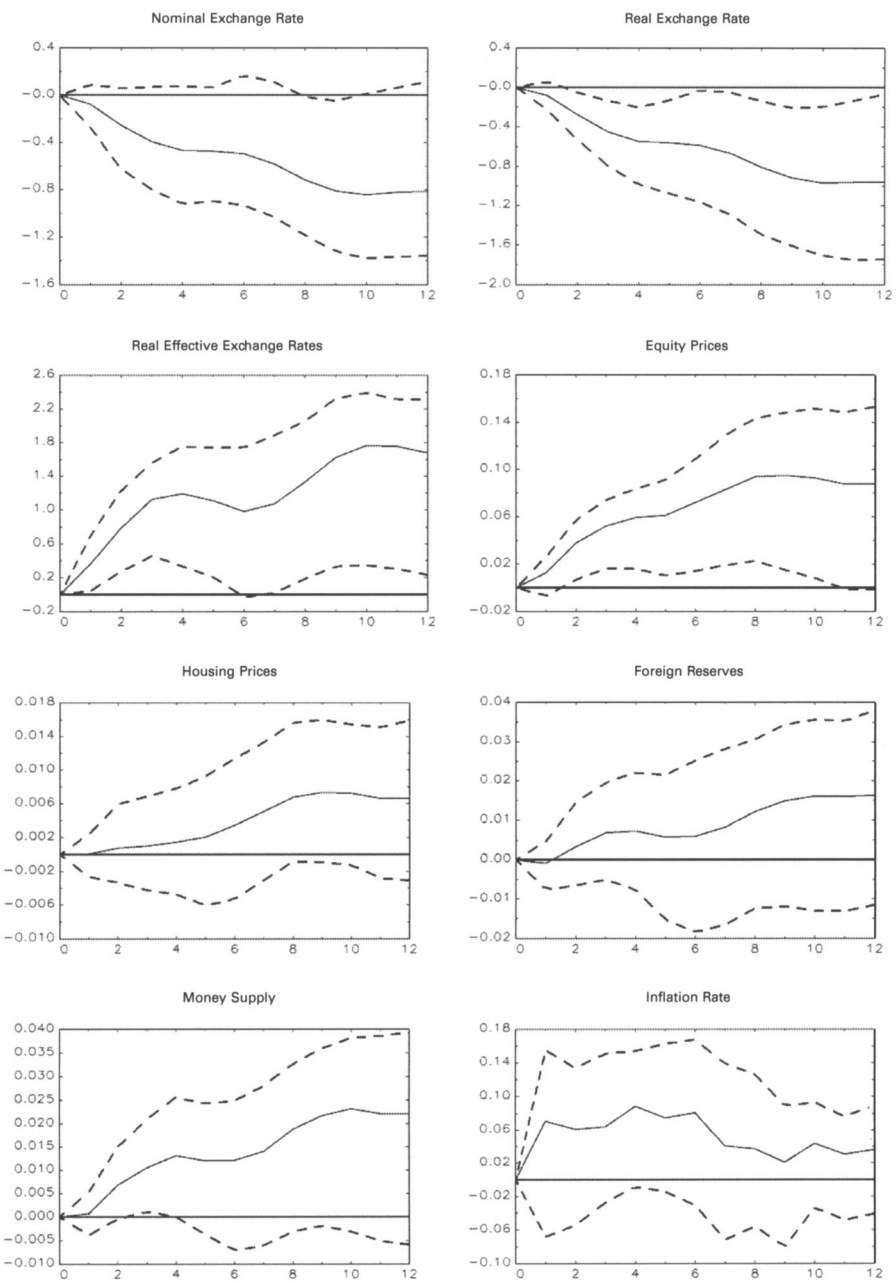
We apply the above VAR model to our study by letting the vector of economic variables y_t be $[NKIF, g_y, i, X]'$ where $NKIF$ denotes total net foreign capital inflows and each of the components which are classified into five types, g_y denotes Thailand's real GDP growth, i denotes the country's policy or interbank rate, and X denotes each of asset price and monetary variables affected by the net capital inflow shocks.

In our study, we separate the shock variables of net capital inflows into different types because we postulate that different types of the inflows have different impacts on the asset prices and financial variables. The various types of the capital inflows are total foreign capital inflows, direct foreign investment, portfolio foreign investment in equity, portfolio foreign investment in domestic bonds, long-term loans, and short-term bank and non-bank loans. Each type of these inflows takes turn to be incorporated into the VAR to simulate the effects of its shock. For the variables that responded to the shocks of capital inflows per GDP, they include nominal and real bilateral exchange rates of baht over the U.S. dollar, the real effective exchange rate, the Thai stock prices, the Thai housing prices, log of domestic foreign exchange reserves, log of domestic money supply, and deseasonalized inflation rate. Each of the above variables is also incorporated into the VAR model one at a time in order to assess the impact of the shocks on the variables of interest individually.

Our estimation of the VAR model uses monthly data from the first month of 1999 to the last month of 2010. In the process of model estimation, we first check the stationarity property of the variables using the Dickey-Fuller unit root test. We find that the variables are stationary upon taking first differences and that they are also cointegrated.[17] Afterward, we analyse the impulse response of all these variables using the vector error correction (VEC) model which includes the error correction terms. In terms of lag length in the estimation, we apply the Akaike criterion to determine the optimal lag length which turns out to be the lag of twelve periods.

Figure 1 shows the estimated impulse responses of each asset price and each monetary variable to the shock of each type of the net capital inflows. First, we examine the impulse responses to the shock of net total foreign capital inflows on each of the asset prices and monetary variables. The immediate impact of the shock of net total foreign capital flows per GDP by one standard deviation on both the nominal and real exchange rates is an appreciation that lasts for about four months. After that, the impact diminishes but the appreciation is sustained to the long term. However, the confidence band becomes increasingly widened over the time

FIGURE 1
Impacts of Total Net Capital Inflows on Asset Prices and Monetary Variables



NOTE: The figures show estimated impulse responses of each of the asset prices and monetary variables to a one standard deviation shock of total net capital inflows per GDP.
SOURCE: Authors' own calculation.

horizon, suggesting that forecasting errors aggravate the further away from the short-term.

The impact of the shock of total capital inflows on the real effective exchange rates is consistent with the impact on the nominal and the real exchange rates. That is, real effective exchange rates appreciate quite steeply in the first four months. After that, the response to the shock declines somewhat with the appreciation rate being persistent to the future. Therefore, we may conclude that an increase in total net capital inflows leads to an appreciation of Thailand's exchange rates both in the nominal and the real terms and both in the form of bilateral and effective rates. The appreciation response is moderate but it has a sustained effect.

A one standard deviation shock in total net foreign capital inflows leads to a steady increase in both the Thai stock index and housing prices for eight months before dampening out. Although the scale of the impact on housing prices is much less than that of the stock index, the effect of the shock on the prices of both assets is quite long lasting.

The shock of total capital inflows has insignificant effect on both foreign exchange reserves and money supply in the first month, but both assets increased steadily for three to four months. After that, the increases slowed down before rising again in the rest of the year. Inflation rate increased steeply upon the impact of the shock of total net capital inflows. It then stabilized to the sixth month before dampening out. On the whole, it seems that despite an effort by the central bank to intervene in the foreign exchange market by accumulating foreign reserves in order to slow down the rate of appreciation of domestic currency in response to the surge of capital inflows, exchange rates appreciate persistently both in the nominal and the real terms. Besides, both money supply and inflation increase despite the sterilization attempt to mop up the increased liquidity through the net capital inflows. Next, we will examine the impact of the shocks of net capital inflows on both the asset prices and the monetary variables by different types of the inflows.

IV.1 The Impact of Direct Foreign Investment

Figure 2 shows the impacts of net direct foreign investment inflows on asset prices and monetary variables. The response of nominal exchange rates, real exchange rates, and real effective exchange rates to an innovation in direct foreign investment per GDP shows that although all kinds of exchanges rates appreciate steadily immediately after the shock, the appreciation declines after the third month and stabilizes over time.

The impact on the domestic equity prices is not persistent. The Thai stock index increases slightly but steadily to the third month. It then declines to the initial level in the eighth month. It seems that the shock has little effect on the index and is not sustainable. The impact of the shock on the housing prices is also little but the prices do increase slowly as far as the ninth month before dampening out after that.

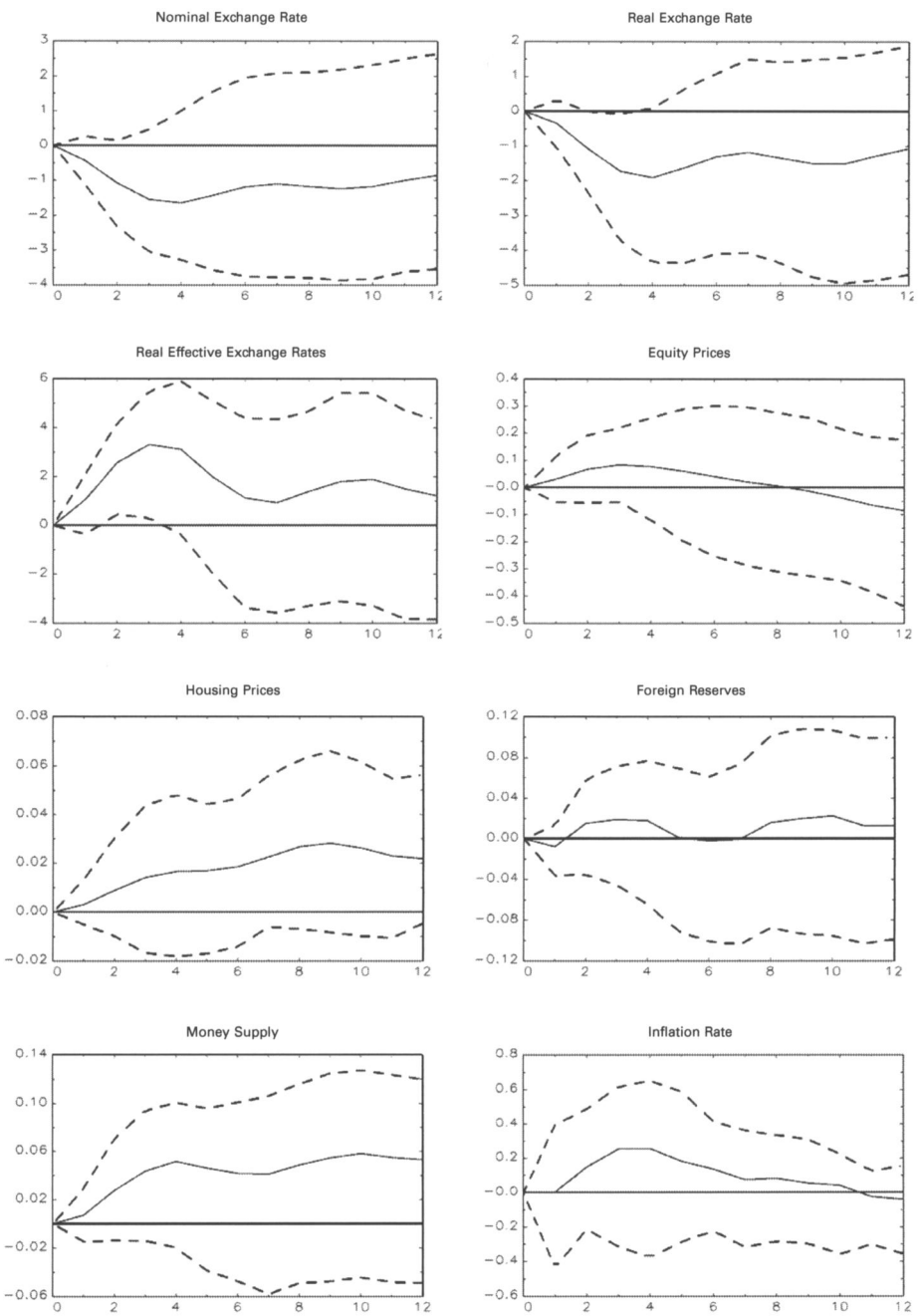
The surge of direct foreign investment has little impact on both the reserves and the money supply. Besides, the response fluctuates over time. The effect on inflation is also insignificant upon impact but it rises steadily for a few months before dying off to the initial level. This may imply that the central bank finds little need to intervene in the foreign exchange market in response to an increase in direct foreign investment because the impact on the exchange rates is mild and the response diminishes not long after the shock. Furthermore, the impact on other asset prices is little and not persistent.

IV.2 The Impact of Foreign Equity Investment

Figure 3 shows the impacts of net foreign portfolio equity inflows on asset prices and monetary variables. The surge in foreign investment in the domestic equity market leads to a steady appreciation of nominal and real exchange rates, including the effective exchange rates in the first four months, but the effect fluctuates somewhat after that.

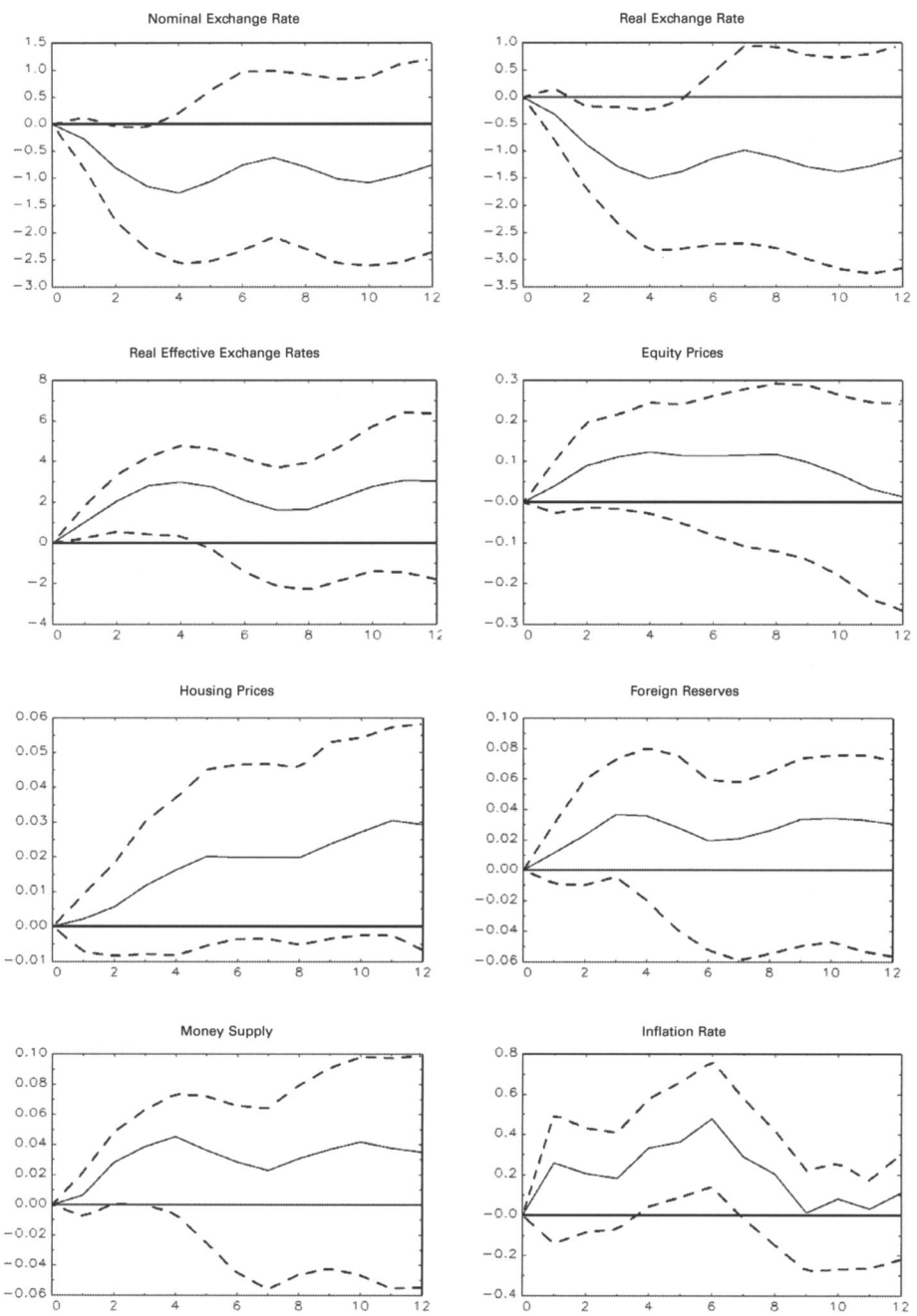
In response to the shock, the Thai stock index increases steadily in the first few months. After that the effect becomes stable for six months

FIGURE 2
Impacts of Net FDI Inflows on Asset Prices and Monetary Variables



NOTE: The figures show estimated impulse responses of each of the asset prices and monetary variables to a one standard deviation shock of net direct foreign investment inflows per GDP.
SOURCE: Authors' own calculation.

FIGURE 3
Impacts of Net Portfolio Equity Inflows on Asset Prices and Monetary Variables



NOTE: The figures show estimated impulse responses of each of the asset prices and monetary variables to a one standard deviation shock of net portfolio equity inflows per GDP.
SOURCE: Authors' own calculation.

before diminishing to the initial level over time. In contrast, housing prices rose steadily along an almost linear upward trend. However, the scale of the effect is much less than the one on the Thai stock index. Both foreign reserves and money supply increase in response to a one-standard deviation shock in the net equity inflows up to the third month but vary in a cycle after that. However, inflation rate rises in response to the innovation for six months before quickly dampening out. On the whole, an innovation of net foreign equity investment leads to an appreciation of the domestic currency as well as increases in stock prices, foreign reserves and inflation in the short-term. The effects on the foreign exchange rate and reserves diminish but are sustained over time. The effects on stock prices and inflation die out in the long-term.

IV.3 The Impact of Foreign Investment in Domestic Bonds

Figure 4 shows the impacts of net foreign portfolio debt inflows on asset prices and monetary variables. In response to the shock of foreign investment in domestic bonds, both nominal and real exchange rates depreciate little upon impact. After the second month, the exchange rates switch to an appreciation and the effect is magnified over the future time horizon. The effect on the real effective exchange rates is also on the appreciation side and persistent to the future periods.

The shock leads to an insignificant change of the Thai equity prices upon impact but they increase sharply to the fourth month before becoming stabilized for about four months and diminishing after that. Housing prices change insignificantly upon impact but increase slowly to the eighth month before dampening out.

Foreign reserves increase mildly in response to the shock but the effect is sustained over time. The effect on the inflation rate is much greater than on housing prices and lasts for about five months before dampening out in cycles. On the whole, the increases in the foreign investment in domestic bonds lead to mild but lasting effects on foreign exchange appreciation and increased equity prices with fluctuating effect on the inflation rate.

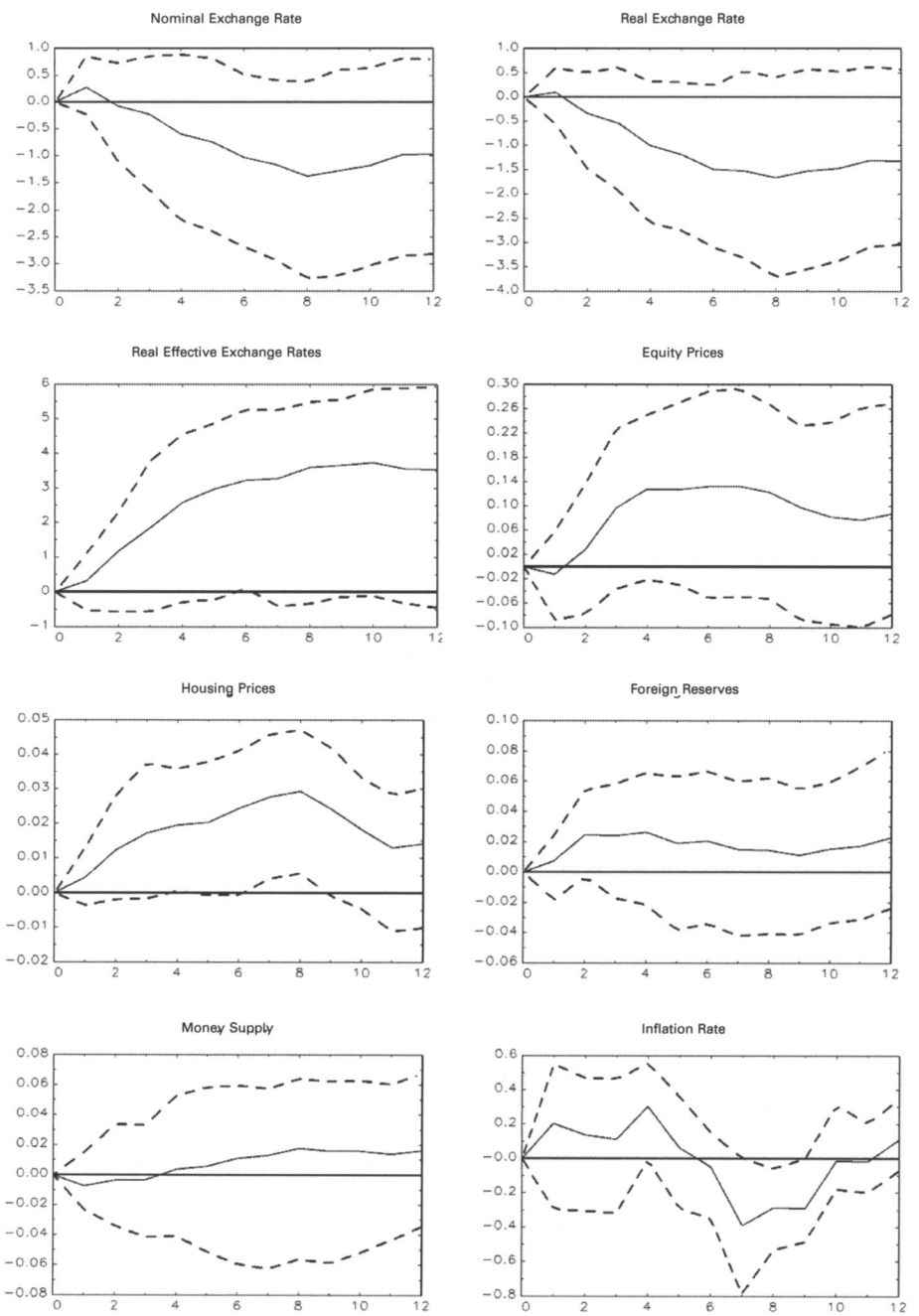
IV.4 The Impact of Long-term Loans

Figure 5 shows the impacts of net long-term loans inflows on asset prices and monetary variables. In response to the shock of a surge in long-term loans nominal exchange rates, real exchange rates, and real effective exchange rates all appreciate steadily and persistently. There is an insignificant change of the Thai stock index in the short-term but it rises steadily after the fifth month and stays persistent to the future period. The effects on housing prices are milder than the effect on Thai stock index but follow a similar rising trend. The effect on the inflation rate is insignificant and it fluctuates over time. There is little change in foreign reserves upon impact. However, after the third month they increase steadily and persistently. Money supply increases little after the shock but the increase is magnified over time. Therefore, long-term loans shocks lead to an increase in almost all asset prices and monetary variables. The impact is not large at the beginning but becomes enlarged and is long lasting.

IV.5 The Impact of Short-term Loans

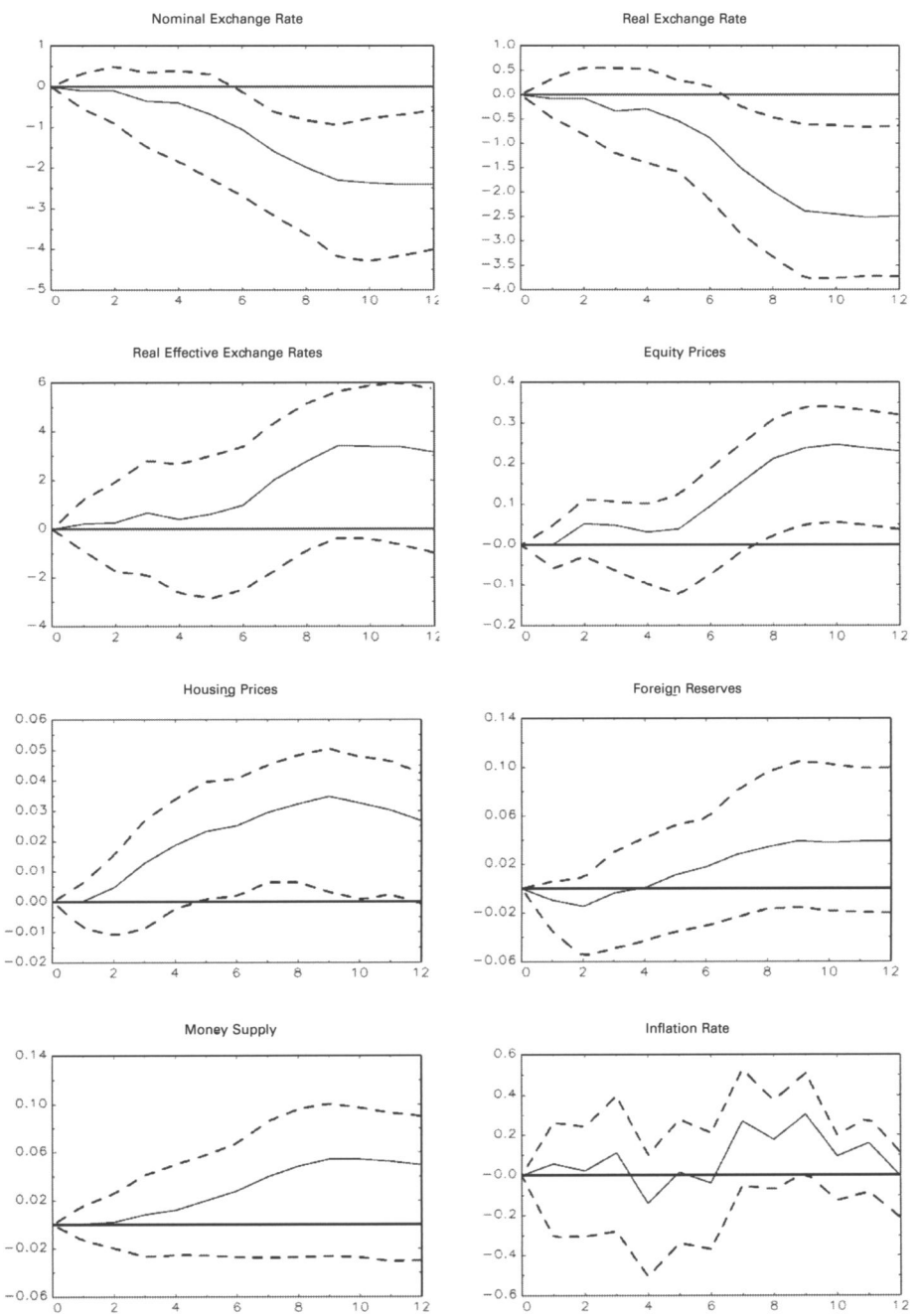
Figure 6 shows the impacts of net short-term loan inflows on asset prices and monetary variables. The effects of the shocks of the short-term loans on nominal and real exchange rates including real effective exchange rates are similar. All appreciate steadily upon impact and the effects are persistent over time. The shocks increase the Thai stock index sharply in the first few months. After that, the rate of increase declines somewhat and stabilizes to the future. Housing prices change little while foreign reserves and money supply increase moderately but persistently as a result of the shock. Inflation rate increases upon impact and the shock induces fluctuated cycles over time. All in all, the surge in short-term loans leads to an increase in almost all asset prices and monetary variables with some of the effects enlarging over time.

FIGURE 4
Impacts of Net Portfolio Debt Inflows on Asset Prices and Monetary Variables



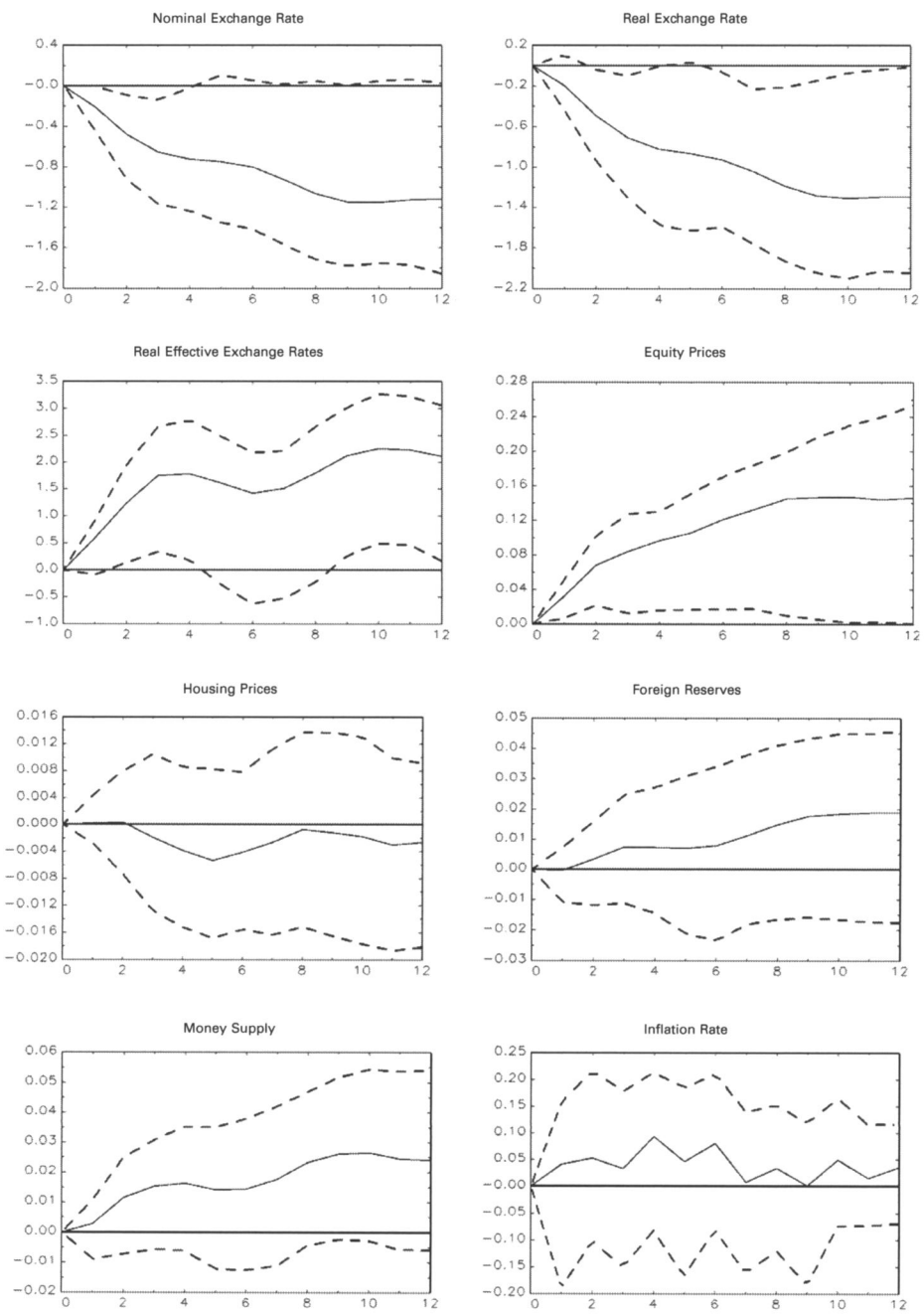
NOTE: The figures show estimated impulse responses of each of the asset prices and monetary variables to a one standard deviation shock of net portfolio debt inflows per GDP.
SOURCE: Authors' own calculation.

FIGURE 5
Impacts of Net Long-Term Loans Inflows on Asset Prices and Monetary Variables



NOTE: The figures show estimated impulse responses of each of the asset prices and monetary variables to a one standard deviation shock of net long-term loan inflows per GDP.
SOURCE: Authors' own calculation.

FIGURE 6
Impacts of Net Short-Term Loans Inflows on Asset Prices and Monetary Variables



NOTE: The figures show estimated impulse responses of each of the asset prices and monetary variables to a one standard deviation shock of net short-term loan inflows per GDP.
SOURCE: Authors' own calculation.

In conclusion, the surges in the net capital flows of all types have the most impact on foreign exchange rates, equity prices, and foreign reserves. The shocks of the total net inflows and each of its components lead to a sustaining appreciation of the domestic currency in both nominal and real terms measured, either in the form of bilateral or effective rates. Both equity prices and foreign reserves increase in response to the shocks of each type of the net inflows but the impact is the most when all net inflows are combined. The impact of all types of the net inflows on money supply is positive. The effect on inflation is mild but fluctuating before dampening out in the long term. Finally, housing prices increase little in response to the shock but the effects are as sustaining on foreign exchange rates and reserves.

V. Conclusion

Thailand has long been opened for inward direct foreign investment under the fixed exchange rate system, but full capital account liberalization was not complete until the early 1990s. Unfortunately, immediately after the opening up there was a surge of the inflows in the form of bank and non-bank short-term loans. These inflows are very sensitive to economic sentiments. When the Thai current account and the credit rating worsened in late 1996 and early 1997, the inflows were quickly reversed and the Thai fixed exchange rates were defeated from the speculative attack in mid-1997. The country fell into the twin currency and financial crises and it took almost two years to recover.

After the crises, the country has remained its open foreign trade and investment policy and foreign capital kept flowing in although on average, the magnitude was not as large as in the early 1990s. There were some changes of the composition of the inflows as well. The net inflows were changed from mostly in the form of foreign loans as in the period in the early 1990s to be predominately direct foreign investment after 1997. Nevertheless, there were certain years after 2000 when the country had experienced episodes of capital inflow surges.

During 2005 to 2007, huge foreign capital flowed into the East Asian region and Thailand was one among many emerging markets which received continuous inflows of all types particularly portfolio and debt investments. Since late 2009, there has been another episode of the surge but this time it was predominated by the jump of portfolio equity, portfolio debt, and short-term loans. In each episode, the authority was very concerned with the sudden inflows reversal and the impact of the surge on the value of Thai currency and the prices of other assets.

There is no doubt that as long as Thailand continues opening its capital account to balance the benefits and costs of the inflows, it will inevitably be affected by future waves of capital inflow surges along with other emerging market recipients. Therefore, there will always be a question of how to manage the fluctuation of the net capital inflows. This study finds out the nature of the net inflows into Thailand, the factors that drive the inflows and their impact on the exchange rate and the prices of other assets.

The findings are that except for direct foreign investment, all types of net foreign capital flowing into Thailand after recovering the crises were hot money. Portfolio equity and debt were the least persistent, followed by short-term loans. However, in terms of volatility and unpredictability of future inflows, short-term loans and portfolio equity were the worst followed by portfolio equity. Foreign direct investment is found to be cold money because it is the long-term investment in the production of goods and services whose determinants are economic fundamentals of the country. In Thailand, since most direct foreign investment is in the manufactured export sector, the investment depends on, *inter alia*, real depreciation which is conducive to export, and the increased risk appetite of foreign investors. Different from direct foreign investment, the major drivers of portfolio equity and debt investment in Thailand are the growth of Asian

emerging market in excess of that of the advanced economies, the returns on investing in the country, and the degree of risk aversion. The wave of the capital inflow surge into Asian region to benefit from the high growth potential has easily spilled over to increase the inflows in Thailand, particularly when the country's returns on investments in the equity and bonds also increase. Finally, the short-term net inflows were attracted by the growth of the country, the rate of real appreciation, and the openness policy. The latter driver explains the major increases in trade credit since 2005.

In examining the impact of the shocks of net foreign capital inflows on asset prices and monetary variables in Thailand, the variables that have the most impact from the foreign inflows of all types are exchange rates, equity prices, and foreign reserves. A surge in the total net inflows leads to persistent appreciation despite the effort of the authority to accumulate foreign reserves to slow down the rate of appreciation. An increase in foreign capital lead to some increases in equity and housing prices but the effect is not as large as the impact on the foreign exchange rates and the reserves.

The surge of foreign capital also leads to some increases in money supply and inflation rate in Thailand. The effect on inflation is moderate but highly unstable. When combining all the effects, we may conclude that in response to a rapid increase in capital inflows, particularly the short- and long-term debt, the Thai policy-makers intervene in the foreign exchange market to prevent the domestic currency from a steep appreciation and sterilize the increased liquidity in the domestic market to control the inflation rate. However, both the intervention which results in foreign reserve accumulation and the sterilization to control money supply are not totally effective. The results are persistent appreciation of the domestic currency and the fluctuating impact on the inflation.

This might turn out to be a sensible policy. Too much intervention to fix the domestic currency will lead to a larger increase in the foreign reserves, which in turn needs greater effort to sterilize the increase in money supply by selling state bonds. Apart from the fiscal cost of sterilization the greater supply of bonds will lead to a greater bond yield and the foreign exchange market intervention might backfire by attracting more foreign investment in domestic bonds or speculation on the future currency appreciation. This might lead to a further surge in the net foreign capital inflows.

Therefore, it is practical for the policy-makers to balance the impacts of the surge of net capital inflows that put upward pressures on the exchange rates and the excessive accumulation of the foreign reserves which entail great sterilization costs. By allowing for some degree of exchange rate appreciation, it has the benefit of putting downward pressure on inflation and thus reducing the need to sterilize the inflows. Besides, for speculators who perceive that domestic currency is undervalued, the appreciation reduces the incentives for flowing in capital to speculate on the appreciation of an undervalued exchange rate.

In fact, an emphasis should instead be put on utilizing most benefits from the capital inflows. As suggested by Kose et al. (2006), emerging markets should increase the efforts to develop institutions and improve governance in order to pass the thresholds of some initial conditions for capital flows to contribute maximally to total factor productivity growth and in turn enhancing the countries' international competitiveness. As for any capital control measures to regulate the capital inflows, they should be set aside for use as the last resort when the exchange rates are in need of a depreciation whereas inflation is difficult to put under control. On the contrary, a policy to relax controls on capital outflows should be much helpful for mitigating the adverse impacts of a surge of net capital inflows.

APPENDIX TABLES

APPENDIX TABLE 1
Net Foreign Direct Investment by Sector
(In US$ million)

	1991	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Industry	939.5	370.0	452.0	513.0	567.1	708.8	1,817.8	2,206.4	1,268.6	1,810.7	2,960.3	1,844.5	2,408.6	3,786.0	3,429.9	4,068.9	3,718.3	5,936.7	3,885.4	3,430.7
Financial institutions	276.0	281.4	64.9	6.8	25.8	72.0	111.7	842.1	247.1	133.0	–186.2	67.3	–24.5	221.7	1,550.9	2,490.2	1,819.3	305.6	–1,063.9	58.4
Trade	304.6	281.2	219.3	341.0	446.3	545.1	1,034.6	1,051.5	1,042.3	67.8	1,069.1	682.2	817.9	182.9	295.2	788.0	611.3	38.1	326.1	480.5
Construction	130.3	574.8	152.3	69.8	36.4	70.4	164.2	191.7	–151.8	–1.7	4.5	19.3	43.0	70.7	29.9	–86.0	35.4	–36.8	22.2	–225.5
Mining & quarrying	81.7	123.6	125.5	52.2	57.0	19.3	20.0	21.7	–41.8	–274.7	759.3	146.6	270.6	192.3	–111.0	206.1	839.7	0.1	549.8	314.8
Agriculture	23.6	–5.8	13.0	–6.3	9.3	2.0	0.8	0.5	1.9	0.7	–4.2	3.2	28.2	5.7	12.6	–1.9	3.2	9.3	7.4	18.1
Services	65.2	85.1	18.5	55.9	87.8	124.9	292.3	276.2	485.0	448.3	155.9	740.6	362.2	303.3	330.9	711.2	1,126.9	430.1	–214.9	430.5
Investment	0.0	7.8	–16.0	146.1	–78.4	–21.3	26.0	363.8	570.8	99.1	–33.7	–656.0	374.7	–236.7	173.6	2,133.3	321.8	6.8	0.9	–215.0
Real estate	143.0	384.0	695.4	472.5	853.2	752.8	112.4	27.7	148.5	69.1	70.9	67.6	126.4	–344.0	43.3	262.6	1,207.5	1,033.5	729.8	599.7
Others	69.0	48.8	7.1	–326.1	–0.7	–3.5	47.0	160.7	–9.0	461.1	252.0	495.5	757.9	774.1	747.8	–92.6	589.2	–180.7	252.3	414.9
Total	2,033.0	2,151.0	1,732.0	1,325.0	2,003.9	2,270.6	3,626.8	5,142.2	3,561.7	2,813.3	5,048.0	3,411.0	5,165.0	4,956.0	6,503.2	10,479.7	10,272.7	7,542.7	4,494.9	5,307.2

SOURCE: Bank of Thailand.

APPENDIX TABLE 2
Net Foreign Portfolio Investment by Sector
(In US$ million)

	1991	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Industry	675.5	249.8	298.2	459.5	605.6	784.7	1,782.8	1,854.2	1,149.5	1,178.7	2,458.9	1,925.8	2,617.8	3,888.3	3,103.2	3,567.8	4,355.6	6,027.1	4,120.9	3,289.0
Financial institutions	9.9	11.5	64.9	6.8	25.8	72.0	111.7	842.1	247.1	133.0	–186.1	67.6	–24.5	372.3	1,540.9	2,256.7	1,508.9	36.3	–632.2	382.4
Trade	243.7	215.3	203.0	280.3	430.3	575.0	943.5	848.3	1,027.5	535.3	842.4	154.3	178.7	308.4	407.1	613.3	1,168.6	137.6	420.4	583.9
Construction	83.7	567.4	138.4	59.7	33.4	56.3	126.4	69.6	–111.5	2.2	6.9	17.0	49.5	50.8	36.0	–106.1	49.5	102.3	7.1	–237.9
Mining & quarrying	81.0	110.4	114.9	44.1	48.8	20.8	42.3	84.9	72.3	16.7	317.2	259.7	290.8	176.6	–31.6	201.2	639.7	–69.1	572.0	377.7
Agriculture	7.2	4.4	13.9	–3.8	11.2	3.3	0.0	0.5	1.9	0.5	–5.9	3.1	9.1	17.6	12.6	–1.1	1.6	1.1	2.1	6.3
Services	52.7	77.5	32.1	61.1	81.8	110.9	299.3	287.6	477.1	476.2	99.1	328.0	470.1	315.1	365.8	336.6	696.5	346.2	79.0	301.1
Investment	0.0	6.9	–12.1	36.6	–87.0	14.7	60.0	374.3	550.5	–39.8	–20.7	–619.9	273.7	–130.7	–3.1	2,133.3	321.8	6.8	0.9	–80.9
Real estate	182.1	403.0	519.1	631.8	744.7	747.2	89.2	14.9	145.9	77.9	75.6	103.0	7.6	–327.4	23.7	89.0	1,150.7	1,156.7	720.5	675.7
Others	50.1	47.8	7.6	–327.2	0.2	0.1	33.3	141.6	–8.9	471.7	272.8	494.5	760.3	773.1	–6.4	–71.4	397.3	0.0	0.0	430.4
Total	1,386.0	1,694.0	1,380.0	1,249.0	1,894.8	2,385.1	3,488.6	4,518.1	3,551.4	2,852.4	3,860.0	2,733.0	4,633.0	5,444.0	5,448.2	9,019.3	10,290.2	7,745.0	5,290.8	5,727.8

SOURCE: Bank of Thailand.

APPENDIX TABLE 3
Net Foreign Direct Investment by Source Country
(In US$ million)

	1991	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Japan	615.2	344.1	305.7	123.4	556.5	523.5	1,348.0	1,484.7	488.4	869.9	1,955.1	1,892.4	2,297.7	2,749.9	2,926.5	2,576.4	3,154.8	2,002.9	2,713.6	1,062.7
U.S.A.	233.2	466.7	286.0	155.9	260.0	429.5	780.7	1,283.3	641.2	617.6	395.0	182.3	336.2	540.4	750.5	165.8	623.9	–214.5	–339.4	451.4
EU	166.3	288.5	243.3	121.6	179.9	168.2	360.0	912.3	1,368.5	509.6	282.9	–216.1	607.6	697.3	335.0	955.4	1,671.6	301.3	980.1	1,690.5
ASEAN	265.3	301.4	60.8	197.8	164.8	312.9	296.5	574.9	572.0	389.0	1,710.7	1,408.3	1,060.4	688.7	1,101.3	4,626.5	2,489.4	221.4	669.4	207.2
Singapore	260.3	283.0	61.1	184.5	136.4	275.3	270.7	542.0	538.1	355.7	1,693.6	1,429.0	1,000.4	345.1	1,068.7	4,279.9	2,447.7	210.3	575.7	74.9
Hong Kong	457.5	582.4	193.6	318.8	279.1	215.1	442.4	393.9	233.7	331.3	150.6	86.3	613.1	141.4	7.2	–77.8	361.0	924.8	126.9	512.7
Taiwan	108.5	88.0	48.9	82.6	96.6	138.0	133.8	106.3	121.5	159.0	156.8	103.7	75.3	124.2	29.2	–94.6	52.8	–15.0	46.1	23.9
South Korea	11.7	10.4	14.6	12.9	12.4	24.8	29.9	72.7	5.5	–3.7	50.6	93.2	23.8	93.5	29.5	79.5	73.9	82.1	105.3	140.3
China	1.5	–4.4	6.9	–1.2	1.9	3.9	–7.8	5.0	–2.1	7.2	–2.5	20.9	23.8	–3.8	11.6	49.9	74.0	6.1	21.7	82.8
Canada	6.0	3.5	6.0	4.5	–2.4	1.1	0.8	3.2	3.0	9.5	5.9	15.0	21.2	28.5	–11.2	7.1	25.8	26.6	13.7	21.9
Australia	71.9	7.1	8.5	10.8	25.2	34.1	119.3	34.6	12.9	26.6	0.6	–0.4	32.5	99.9	–1.1	11.2	70.1	82.9	67.2	65.9
Switzerland	48.2	30.7	10.9	26.8	15.9	52.0	120.5	73.2	60.4	32.2	55.3	48.1	124.1	167.3	99.8	153.9	173.0	442.0	74.9	104.6
Others	47.8	32.5	546.7	271.2	414.0	367.6	3.1	199.1	56.9	–135.6	287.9	–223.7	–52.8	–374.9	1,224.9	2,021.8	1,481.4	3,716.1	8.4	943.2
Total	2,033.0	2,151.0	1,732.0	1,325.0	2,003.9	2,270.6	3,626.8	5,142.2	3,561.8	2,813.3	5,048.0	3,411.0	5,165.0	4,956.0	6,503.2	10,479.7	10,272.7	7,542.7	4,494.9	5,307.1

SOURCE: Bank of Thailand.

APPENDIX TABLE 4
Net Foreign Portfolio Investment by Source Country
(In US$ million)

	1991	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Japan	486.3	308.2	288.9	280.3	500.2	634.8	1,342.6	1,123.5	419.7	705.0	1,712.4	1,878.9	2,041.3	2,703.0	2,733.0	2,369.3	3,204.2	2,522.9	2,922.3	1,128.5
U.S.A.	171.9	460.1	201.1	140.3	254.3	487.0	755.3	1,327.6	637.4	375.4	538.8	315.6	427.4	526.4	560.0	401.8	1,184.6	–345.6	–118.2	453.7
EU	120.6	226.8	143.7	112.7	149.9	214.8	353.1	867.7	1,368.9	615.2	722.6	9.6	818.7	789.1	157.6	405.0	1,191.5	864.2	1,234.0	1,514.1
ASEAN	84.0	90.1	40.8	65.4	169.6	246.3	299.8	473.0	668.0	401.0	388.5	175.5	564.2	749.7	1,264.5	3,999.7	2,101.7	–82.4	764.6	891.5
Singapore	79.2	76.9	34.7	52.1	138.3	211.0	273.3	449.2	634.7	367.1	372.8	175.8	458.4	575.1	1,214.1	3,654.2	2,059.7	–44.0	694.3	750.8
Hong Kong	278.2	445.8	170.7	253.4	254.7	179.3	363.2	308.1	205.5	345.9	131.7	134.8	566.8	222.8	–15.9	–137.4	539.0	849.7	89.8	518.5
Taiwan	104.3	87.3	49.0	88.4	103.6	133.7	125.6	92.4	125.8	163.2	137.2	93.9	59.4	135.1	22.7	–114.1	36.4	–8.9	49.9	16.7
South Korea	11.3	10.5	14.6	3.1	12.5	19.0	23.7	11.9	2.7	4.6	50.0	68.1	13.1	86.8	29.6	78.6	89.0	75.6	110.2	143.2
China	1.7	–4.4	6.9	–2.5	–0.9	3.9	–5.8	4.6	–2.7	3.6	–2.2	20.7	20.7	3.1	13.8	40.2	74.0	6.9	4.7	70.3
Canada	4.0	3.7	6.0	0.7	0.6	1.1	1.8	3.2	2.8	10.5	5.8	6.8	21.1	27.9	–6.9	7.6	26.4	26.3	13.5	18.1
Australia	41.7	17.8	8.8	16.2	27.2	33.9	109.8	33.1	13.2	37.0	3.2	14.2	33.0	47.4	–3.8	–0.7	90.6	77.4	93.9	52.5
Switzerland	41.5	29.7	12.3	26.3	15.7	52.2	108.5	58.2	60.8	44.4	53.3	56.7	130.4	158.1	144.0	131.0	202.7	123.7	35.6	84.4
Others	40.3	18.5	436.9	264.7	407.4	379.0	11.5	215.9	49.2	145.9	119.7	–42.9	–65.1	–8.8	549.4	1,837.8	1,527.1	3,669.4	81.8	836.4
Total	1,386.0	1,694.0	1,380.0	1,249.0	1,894.8	2,385.1	3,488.6	4,518.1	3,551.4	2,852.4	3,860.0	2,733.0	4,633.0	5,444.0	5,448.2	9,019.3	10,290.2	7,745.0	5,290.8	5,727.8

SOURCE: Bank of Thailand.

APPENDIX TABLE 5
Augmented Dickey and Fuller Tests for Unit Roots of
Net Capital Inflows per GDP by Type

Variable	*Levels*	*First differences*
TKF/GDP	–2.06	–4.50*
FDI/GDP	–2.39	–6.76*
FPIE/GDP	–2.39	–5.63*
FPID/GDP	–3.91*	–5.31*
LTL/GDP	–3.11	–5.67*
STL/GDP	–2.60	–3.99*

NOTE: Figures in Appendix Table 5 are the reported Augmented Dickey and Fuller statistics. The critical value for the statistics at the 5 per cent significance level is 3.51.

APPENDIX TABLE 6
Augmented Dickey and Fuller Tests for Unit Roots of Determinants of
Net Capital Flows in All Estimation Models

Variable	*Levels*	*First differences*
Bond Return	–2.14	–6.92*
Growth ASIA	–2.25	–2.24
Growth OECD	–3.46	–6.51*
Growth Thai	–3.00	–3.91*
Growth ASIA-Growth OECD	–2.86	–5.49*
Growth Thai-Growth OECD	–3.23	–12.96*
Interbank-FED	–2.99	–4.94*
Housing Prices	–4.01*	–11.13*
RER Change	–6.06*	–10.05*
Stock Return	–5.40*	–11.32*
World Liquidity	–1.83	–4.10*
Openness	–2.63	–5.33*
VIX	–2.90	–6.33*

NOTE: Figures in Appendix Table 6 are the reported Augmented Dickey and Fuller statistics. The critical value for the statistics at the 5 per cent significance level is 3.51.

APPENDIX TABLE 7
Cointegration Tests for Determinants of Net Capital Flows Equations

Estimation Model	*Testing statistic*
TKF/GDP	–7.4233
FDI/GDP	–6.5920
FPIE/GDP	–7.3833
FPID/GDP	–8.1371
LTL/GDP	–8.0313
STL/GDP	–5.3059

NOTE: Figures in Appendix Table 7 are the testing statistics of the residual term in each equation. The critical value for the statistics at the 5 per cent significance level is –1.95.

APPENDIX TABLE 8
Augmented Dickey and Fuller Tests for Unit Roots of Variables in VEC Models

Variable	*Levels*	*First differences*
GDP Growth	–6.43*	
Interbank Rate	–1.57	–9.74*
Nominal Exchange Rate	–2.67	–8.27*
Real Exchange Rate	–2.63	–8.49*
Real Effective Exchange Rate	–2.61	–8.42*
Stock Index	–1.46	–10.46*
Housing Prices	–3.57*	
International Reserves	–1.00	–10.18*
Money Supply	–2.28	–8.90*
Inflation Rate	–5.30*	

NOTE: Figures in Appendix Table 8 are the reported Augmented Dickey and Fuller statistics. The critical value for the statistics at the 5 per cent significance level is 3.44.

APPENDIX TABLE 9
Cointegration Tests for the VEC models

	No. of Cointegrated Equations	*TKF*		*FDI*		*FPIE*		*FPID*		*LTL*		*STL*	
		Trace	*Maximum Eigenvalue*	*Trace*	*Maximum Eigenvalue*	*Trace*	*Maximum Eigenvalue*	*Trace*	*Maximum Eigenvalue*	*Trace*	*Maximum Eigenvalue*	*Trace*	*Maximum Eigenvalue*
NER	None	138.60*	67.58*	139.02*	66.06*	148.63*	72.42*	152.70*	66.20*	144.41*	73.27*	143.57*	71.92*
	At most 1	71.02*	43.85*	72.96*	47.03*	76.21*	44.91*	86.50*	46.63*	71.14*	45.07*	71.65*	43.27*
	At most 2	27.17	20.19	25.93	19.32	31.30*	24.30*	39.87*	33.76*	26.07	19.69	28.38	22.69*
	At most 3	6.98	6.81	6.61	6.14	7.0	6.51	6.11	5.72	6.38	6.33	5.69	5.42
	At most 4	0.17	0.17	0.47	0.47	0.49	0.49	0.38	0.38	0.05	0.05	0.27	0.27
RER	None	136.87*	64.11*	134.79*	62.89*	144.73*	69.43*	149.85*	63.51*	141.66*	70.25*	142.39*	68.16*
	At most 1	72.76*	43.23*	71.90*	45.37*	75.29*	43.96*	86.34*	46.05*	71.41*	44.37*	74.22*	42.86*
	At most 2	29.53	22.27*	26.53	19.32	31.33*	24.37*	40.29*	33.43*	27.03	19.92	31.36*	25.52*
	At most 3	7.26	7.22	7.21	6.88	6.96	6.65	6.86	6.51	7.12	7.09	5.83	5.75
	At most 4	0.04	0.04	0.33	0.33	0.31	0.31	0.34	0.34	0.03	0.03	0.08	0.08
REER	None	135.87*	60.68*	138.08*	60.37*	154.41*	66.39*	149.14*	60.19*	140.45*	68.41*	139.35*	62.30*
	At most 1	75.19*	46.43*	77.72*	47.64*	88.02*	49.38*	88.95*	46.72*	72.04*	46.35*	77.05*	46.57*
	At most 2	28.76	17.98	30.08*	19.53	38.64*	26.61*	42.23*	31.45*	25.7	16.14	30.48*	21.07
	At most 3	10.78	9.59	10.55	8.7	12.03	9.35	10.79	8.44	9.55	8.68	9.41	7.9
	At most 4	1.2	1.2	1.85	1.85	2.68	2.68	2.35	2.35	0.87	0.87	1.51	1.52
STOCK	None	137.17*	63.70*	130.18*	62.68*	144.70*	68.63*	156.57*	64.81*	158.83*	68.52*	130.53*	66.62*
PRICES	At most 1	73.47*	44.55*	67.51*	47.86*	76.07*	43.44*	91.77*	49.17*	90.31*	53.56*	63.91*	44.19*
	At most 2	28.92	22.99*	19.64	16.56	32.64*	27.80*	42.59*	38.81*	36.75*	31.96*	19.72	14.92
	At most 3	5.94	4.63	3.08	2.76	4.84	3.92	3.79	3.17	4.79	4.34	4.8	3.76
	At most 4	1.3	1.3	0.32	0.32	0.92	0.92	0.62	0.62	0.45	0.45	1.04	1.04
HOUSING	None	131.43*	65.59	133.08*	62.57*	145.94*	70.75*	157.43*	71.31*	143.17*	70.23*	126.99*	64.16*
PRICES	At most 1	65.84*	42.49	70.50*	44.74*	75.19*	44.08*	86.12*	43.85*	72.94*	43.66*	62.83*	42.63*
	At most 2	23.35	17.94	25.77	21.88	31.11*	26.35*	42.27*	38.58*	29.29	24.77*	20.2	15.77
	At most 3	5.41	4.81	3.89	2.75	4.76	3.72	3.7	2.95	4.52	3.83	4.42	3.52
	At most 4	0.6	0.6	1.14	1.14	1.04	1.04	0.74	0.74	0.69	0.69	0.91	0.91
RESERVES	None	154.34*	64.83*	158.95*	61.65*	173.63*	73.04*	172.74*	65.50*	161.96*	68.49*	153.09*	63.50*
	At most 1	89.51*	51.15*	97.30*	51.66*	100.59*	53.93*	107.24*	51.31*	93.47*	51.90*	89.59*	51.44*
	At most 2	38.36*	20.38	45.63*	26.51*	46.66*	31.61*	55.93*	36.08*	41.57*	23.34*	38.16*	21.92*
	At most 3	17.99	16.22	19.12*	18.46*	15.05	13.5	19.86*	19.26*	18.23*	16.76*	16.24*	14.96*
	At most 4	1.76	1.76	0.67	0.67	1.55	1.55	0.59	0.59	1.48	1.48	1.28	1.28
MONEY	None	144.83*	68.39*	145.24*	66.49*	153.64*	71.83*	161.56*	68.02*	148.83*	73.49*	148.32*	70.10*
SUPPLY	At most 1	76.43*	43.43*	78.76*	45.95*	81.81*	44.84*	93.55*	46.91*	75.34*	44.40*	78.22*	42.93*
	At most 2	33.00*	22.93*	32.81*	23.64*	36.97*	25.74*	46.64*	37.39*	30.94*	20.98	35.29*	27.40*
	At most 3	10.07	8.75	9.17	8.38	11.23	10.14	9.25	8.32	9.96	8.39	7.89	6.64
	At most 4	1.32	1.32	0.8	0.8	1.09	1.09	0.92	0.92	1.58	1.58	1.24	1.24

NOTE: The asterisk represents rejection of the hypothesis that there exist no cointegrating relationships among variables in the estimation models at the 5 per cent significance level.
SOURCE: Authors' own calculation.

NOTES

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1. The deep recession after the crisis could partly be explained by the tight monetary and fiscal policy with the primary aim of reducing the current account deficits and mitigating the downward spiral of the baht depreciation which had aggravated the country's huge debt burden. In retrospect, the policy might be effective on returning the overshooting of the baht depreciation to its realistic rate quickly. However, the tight macroeconomic policy of holding the government budget surplus and keeping the interest rates high had resulted in a deep recession that need over a year after the crisis to recover from it. Thus, if we were to give a balance assessment of the policy choice immediately after the crisis we might justify it on the ground that it had given a priority to the objective of external stability over an economic stimulation.
2. In mid-1998 when the exchange rates and inflation became more stable, the government began to shift the policy objective to enhance economic growth and employment creation. The government drastically cut the interest rates and steadily increased its spending to stimulate the economy. The central bank policy rate was reduced from 13 per cent in 1998 to merely 1.7 per cent in 1999 and the government increased its budget deficit from 1.5 per cent in 1997 to 3.3 per cent of GDP in 1999. With the help of the stimulation policy, the favourable world economy, and the benefit of baht depreciation after the exchange rates were allowed to float, both exports and domestic consumption grew rapidly and the Thai economy was able to recover from the crises in 1999.
3. During Thaksin's administration he introduced a series of programmes to stimulate consumption of the lower income voters. The programmes include low cost health-care scheme, low-cost housing projects, cash transfer to the rural sector, easy credit given particularly to farmers, the rural and urban poor, and small businesses. See Bhongmakapat (2006) for a detailed assessment of Thailand's macroeconomic policies and their implications on economic stability and short and long term growth during the period after the 1997 crisis to 2004.
4. See Ostry et al. (2010) on the recent study on the use of capital control as a tool for coping with surge in capital inflows and evidence on the effectiveness of the controls.
5. Due to Thaksin's unflagging popularity especially among the rural and low-income population despite the coup in 2006 to discredit his integrity, the political party he was backing while in exile abroad won the majority in 2008 general election and two prime ministers from the winning party tried to form the governments twice just to be overthrown by the Constitution Court and street protests of the opposition. Finally, it was left to the second majority party to form the government in late 2008 and it had held the office to 2011.
6. After the financial liberalization in the early 1990s the type of net capital inflows that increased the most was in the form of private borrowing of both the banking and nonbanking sectors in U.S. dollar-denominated loans under the country's nearly fixed exchange rates. The inflows were mostly invested in the nontradable sector especially in the real estates and the equity markets, and eventually created asset price bubbles.
7. See Appendix Tables 1 and 2 on the changes of quantity of net foreign direct and portfolio investment inflows by sector during 1991 to 2010 based on data from the Bank of Thailand.
8. See Appendix Tables 3 and 4 on the changes of quantity of net foreign direct and portfolio investment inflows by source country during 1991 to 2010 based on data from the Bank of Thailand.
9. See Appendix Table 1 for evidence.
10. By using the correlogram to determine persistency, we compute the autocorrelation of the time series of each type of the net capital inflows. If the net capital inflows were persistent we expect them to display a strong correlation with their own past values. The autocorrelation coefficients are then expected to be significantly large and positive in the initial months but are possible to decay as the lags increase within the total time span of at least twenty-four months. But if the coefficients were zero or altering the sign between positive and negative during the time span, we would determine that the net capital inflows were not persistent, namely, easily flowing in and out of a country.
11. See the note in Table 4 on how the conditional variance coefficients are computed.
12. See the note in Table 5 on the computation and interpretation of the Theil inequality coefficients.
13. See Taylor and Sarno (1997) and Mody, Taylor, and Kim (2001) for selected studies on factors determining capital flows to developing countries.
14. See Appendix Tables 5 and 6 where Appendix Table 5 shows the test of stationarity of total net capital inflows per GDP and the net inflows by type and Appendix Table 6 shows the test for stationarity of all the independent

variables in each estimation model of the determinants of net capital inflows. Both tables show that almost all series are nonstationary in the level form. In contrast, the nonstationarity hypothesis can be rejected in the first differences form.

15. Appendix Table 7 presents the results of the Engle and Granger (1987) test for cointegration. It is found that a long-run relationship exists in each of the estimation models used for finding the determinants of the total net capital inflows and each of their components.
16. It is easier to find empirical studies on the effects of capital account liberalization on growth than on asset prices. See Henry (2003), Bonfiglioli (2008), Quinn and Toyoda (2008), and Kose, Prasad, and Terrones (2009) on recent studies of the effects on growth and productivity. Empirical studies of the effects on exchange rates and asset prices are found in for example, Calvo, Leiderman, and Reinhart (1993), Henry (2000), Bekaert, Harvey, and Rumsdaine (2002), and Kim and Yang (2009).
17. See Appendix Tables 8 and 9 for the test for stationarity and cointegration of all the variables in the estimation models.

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