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The Impact of Capital Inflows
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Economies: Is Too Much Money
Chasing Too Little Good?

Soyoung Kim and Doo Yong Yang

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Soyoung Kim⁺ and Doo Yong Yang⁺⁺

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⁺ Department of Economics, Korea University, Anam-Dong, Sungbuk-Gu, Seoul, Korea 136-701, e-mail: soyoungkim@korea.ac.kr.

⁺⁺ Department of International Finance and Macroeconomics, Korea Institute for International Economic Policy (KIEP), 300-4 Yum Gok Dong, Seoul, Korea, e-mail yangdy@kiep.go.kr.

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Unless otherwise noted, \$ refers to US dollars.

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Abstract

In recent years, emerging East Asian economies have experienced large capital inflows—especially a surge in portfolio inflows—and an appreciation of asset prices such as equities, land, and both nominal and real exchange rates. The paper reviews why a surge in capital inflows can increase asset prices, and then empirically investigates the effects by employing a panel vector autoregression (VAR) model. The empirical results suggest that capital inflows have indeed contributed to the asset price appreciation in this region, although capital inflow shocks explain a relatively small part of asset price fluctuations. How to manage these capital inflows is also discussed.

Keywords: Capital inflows, portfolio inflows, asset prices.

JEL Classifications: F10, F31, F32, G15, G18

I. Introduction

The recent surge in foreign capital inflows and increasing asset prices in emerging East Asia¹ are a major concern for the region's economic managers. Capital inflows into financial markets in particular have been accompanied by exchange rate appreciation, increases in liquidity, and a rise in asset prices. Policymakers and academia are concerned that the huge capital inflows might be contributing to financial instability and having a negative impact on the real economy. Financial market stability is critical to macroeconomic management and these trends have therefore become a significant consideration in policy making.

However, the policy options for mitigating the harmful effects of large capital inflows are limited. Potential difficulties arise, for example, in complicated policy goals that present trade-offs between domestic and external objectives. Discerning the implications of increased portfolio inflows requires an assessment of the impact on the region's capital markets. It is also important to understand the context surrounding these capital inflows. This paper documents the trends and background of capital inflows and asset price appreciation in the region, empirically examines the effects of surging capital inflows on asset prices, and discusses various policy issues.

Over the past 25 years, gross capital inflows² to emerging East Asia have increased significantly. Indeed, they recently surpassed the peak reached just prior to the 1997/98 Asian financial crisis. Gross capital inflows to these economies had reached \$216 billion by 2005—from slightly over \$140 billion in 1996. In the 1980s and early 1990s bank loans and foreign direct investment (FDI) were the primary source of capital flows into emerging East Asia, accounting for more than half of all private capital inflows. However, more recently, portfolio investments have grown to take up a large portion of the total. The share of portfolio inflows to gross capital inflows has held at 31% since 2003, after rising from 14% in 2002. In some cases, portfolio flows have become significantly high relative to the size of domestic capital markets, with potentially large direct impact on asset prices—both on the way in and the way out.

The current surge in capital inflows, especially portfolio inflows, has been induced by push factors related to the global economic environment, and pull factors related to post-crisis changes in the region. Given low interest rates and declining asset investment returns in advanced economies, investor demand for opportunities in emerging market portfolio assets has soared, fueled in part by speculative activities such as the yen-carry trade. At the same time, several economies in the region have relaxed regulatory restrictions on foreign portfolio investments—through capital market/account liberalization—further spurring portfolio inflows. Higher activity among domestic investors resulting from rapid growth of income from the export sector—as well as ample monetary liquidity—is another possible factor.

Capital inflows can help domestic economies in various ways: portfolio inflows—or more generally capital inflows—can help finance domestic investment and contribute to long-run economic growth. Foreign portfolio inflows can provide a better opportunity for local capital market development, generally providing increased liquidity and price recovery mechanisms. And as foreign capital flows into the market, economic authorities may come under greater peer pressure to adopt more internationally accepted practices and standards in financial systems.

¹ In this paper, emerging East Asia refers to People's Republic of China (PRC), Indonesia, Republic of Korea (Korea), Malaysia, Philippines, and Thailand.

² Gross capital inflows are defined as the sum of total inflows from foreign direct investment (FDI), portfolio investments, and other investment transactions by nonresidents.

However, large capital inflows may also produce undesirable macroeconomic effects. History tells us that rapid capital outflow can often follow periods of rapid inflow, generating boom-bust cycles. The initial period of capital inflows is often characterized by real exchange rate appreciation, domestic credit expansion, booming consumption and/or investment, and asset price bubbles. Over time, the process tends to reverse itself: real exchange rate appreciation weakens the current account and reduces the attractiveness of domestic assets to foreign investors. Net capital inflows turn into net outflows, and boom turns to bust, with adverse consequences for local asset prices and, often, the real economy.

The factors linking capital inflows, credit expansion and lending booms with capital liberalization and adverse macroeconomic consequences are not new in emerging East Asia. Several studies have pointed this out: Corsetti et al. (1998) suggests that the causes of the 1997/98 crisis lay in financial over-lending, banking problems, and the composition, maturity and size of capital inflows. Mishkin (1999) also asserts that the crisis started with financial liberalization that resulted in a lending boom which was fed by capital inflows—bank lending expanded so rapidly that excessive risk-taking prevailed. Excessive bank lending to the real estate sector was also noted. Sachs and Woo (2000) point out that too much money was poured into speculative real estate projects. Krugman (1998) also states that the problem began with financial institutions whose liabilities were perceived as having an implicit government guarantee, but were essentially unregulated and therefore subject to severe moral hazard. The excessive risk lending by these institutions caused price increases, not of goods, but of financial assets.

Against this background, the effects and policy implications of portfolio inflows on asset prices and exchange rates are particularly important in implementing appropriate policy measures to deal with the risks. Section II summarizes trends in capital inflows to the region and provides an explanation of the recent surge—portfolio inflows in particular. Section III documents recent trends in asset prices and exchange rates and discusses the potential effects of capital inflows on them. Section IV provides an empirical analysis of the effects of capital inflows and foreign portfolio inflows on asset prices using panel vector autoregression (VAR) models. Section V discusses policy options, and Section VI concludes.

II. Recent Trends of Capital Flows in Selected Emerging East Asian Economies

For the last 3 decades there have been large and increasing cross-border capital flows between economies around the world. Profit-seeking and diversification of risk by domestic and multinational financial institutions has contributed significantly. In the 1990s, capital inflows started to take on diverse forms as investors from advanced economies spread their assets internationally. Cross-border capital flows in general grew rapidly from the 1980s as institutional investors diversified to lower risks in their international portfolios. New information and communication technologies that enabled global investment and broadened opportunity to manage risk through diversified investment fueled the trend. Now, an increasing number of institutional investors, including insurance companies, pension funds, and hedge funds are investing in emerging markets. At the same time, global cyclical factors such as lower interest rates and higher liquidity favor increasing cross-border capital flows.

While this has occurred globally, East Asia's emerging markets have been marked by greater capital inflows for several reasons. First, economic fundamentals among the region's economies have improved significantly, as most crisis-affected economies have returned to growth with risk premiums down. Second, some currencies in the region are undervalued against the United States (US) dollar. And because there is an expectation that the dollar will depreciate further

because of the still-large US current account deficit, it seems safe to say that these undervalued currencies carry more weight in international portfolios among investors, both in the region and internationally. Third, many economies have loosened regulatory requirements on foreign portfolio inflows through liberalization of capital controls. Together, these factors have contributed to a strong increase in inflows into the region's stock, bond, and real estate markets, although the magnitude of impact varies across economies and markets, depending on local factors.

A. Trends in Gross Capital Inflows

As a result of the push and pull factors, gross capital inflows in emerging East Asian economies reached over \$200 billion in 2005, up 100% over the previous peak in 1997 (Figure 1). At about 5% of GDP, it remains lower than the 7% of the mid-1990s, but the trend is increasing (Figure 2). The People's Republic of China (PRC) has been the main destination since 1993—by 2005 its share of total capital inflows among these economies had increased dramatically to 73%, from 17% in 1992.

Figure 3 shows the pattern of capital inflows in these economies, with FDI constituting a major component, at 70% of the total. Since the early 1990s, FDI flows into East Asia have increased, especially concentrated in the PRC and the southeast Asian countries. Debt financing had more weight than equity financing in the late 1980s. Since the early 1990s, however, equity inflows have increased, in particular since the Asian crisis, after which most economies in the region began removing barriers to foreign investment in equity markets.

B. Trends in Gross Capital Outflows³

Gross capital outflows have increased rapidly in recent years, reaching unprecedented levels. In emerging East Asian outflows reached over \$130 billion in 2005, or 4% of gross domestic product (GDP), an increase of close to 400% over the last 10 years. The PRC's share of capital outflows constituted over 60% in 2005, followed by the Republic of Korea (Korea) and Indonesia (Figures 4, 5).

Capital outflows are primarily composed of portfolio investments, bonds in particular, which comprise over 60% of the total. This reflects a large proportion of PRC and Korean banks' purchases of nonresident debt securities. Growing opportunities for foreign investment by institutional investors made available to private investors could constitute an important channel for the expansion of capital outflows. In 2006, the PRC announced a set of measures to provide individual savers greater access to foreign assets. The Qualified Domestic Institutional Investors (QDII) system now allows foreign investment of domestic savings, although the availability of such funds is currently limited. Korea also encourages more domestic individual investment abroad through mutual funds.

FDI outflows have increased as Asian firms have moved to establish global supply and sales networks. Outward FDI from the PRC has grown rapidly. In Korea, FDI outflows have also increased as the country's leading automobile and electronics firms have expanded a sizable portion of their production overseas.

There are several considerations regarding the shift in the composition of capital flows to the region. The first is that the variability of overall flows may be a bit lower. In general, experience

³ Gross capital outflows refer to resident investment abroad—including FDI, portfolio, and other investments.

shows that FDI has been the least variable type of capital flow, bank loans the most, and portfolio equity flows nearly as variable as bank loans. However, as stock and bond market depth and liquidity increase, there is evidence that the volatility of FDI and debt securities flows may increase.⁴ Second, there are important differences in the consequences of flow reversals. Compared with bank lending, FDI is less subject to sharp reversals. For portfolio investments in debt and equity markets, the direct impact of reversals is less likely to severely affect the economy because asset equity price adjustments will quickly reduce the balance of payments impact of sudden large outflows. There are, of course, potentially significant indirect transmission channels to the real economy—through wealth effects on spending and, more seriously, potential banking sector exposure to asset markets through securities holdings or through credit exposure to investors.

III. Effects of Portfolio Inflows on Capital Markets in Emerging East Asia

A. Capital Inflows, Asset Prices, and Exchange Rates

Capital inflows may result in an increase in asset prices and an appreciation of nominal and real exchange rates. Capital inflows can affect asset prices in three ways. First, foreign portfolio inflows can directly affect the demand for assets. For example, capital inflows to stock markets increase the demand and, therefore, price of stocks. In addition, portfolio inflows may subsequently affect other markets. For example, as capital flows into stock markets, prices increase, but the expected return on stocks may decrease. Investors may then seek higher returns in other asset markets, such as real estate and bonds, thereby putting upward pressure on other asset prices.

Second, capital inflows may result in an increase in money supply and liquidity, which in turn may boost asset prices. Capital inflows tend to cause nominal and real exchange rates to appreciate. If monetary authorities wish to avoid that they must intervene in the foreign exchange market to offset excess demand for the local currency by buying foreign currency. This results in an accumulation of foreign exchange reserves and, accordingly, domestic money supply. When this leads to an increase in liquidity flows into asset markets, asset prices may surge. The foreign exchange intervention may be sterilized by selling government securities through an open market operation. However, if sterilization is partial, then liquidity and asset prices may increase.

Third, capital inflows tend to fuel strong economic growth—as past studies have shown—and lead to an increase in asset prices in several ways. Monetary expansion following capital inflow may lead to an economic boom. Falling world interest rates may lead to consumption and investment booms, and also lower domestic interest rates, which in turn may boost investment. And, for a debtor country, a fall in world interest rates will induce income and substitution effects, which may also lead to a consumption boom.

Capital inflows tend to lead to an appreciation of nominal and real exchange rates. Under a floating exchange rate regime, foreign portfolio inflows would directly affect the demand for domestic currency assets, which leads to appreciation in the nominal exchange rate. Combined with sticky prices, the real exchange rate can also appreciate. On the other hand, under a managed float, if the monetary authority intervenes in the foreign exchange market the nominal appreciation may be avoided. However, the real exchange rate may still appreciate. As

⁴ See Lipsey (1999), Albuquerque (2002).

discussed, consumption and investment booms are likely to increase the price of non-traded goods more than the price of traded goods because the supply of non-traded goods is more limited than the supply of traded goods.

B. Trends in Asset Prices

Figure 6 shows equity prices for four ASEAN countries, PRC, and Korea. In these countries, stock prices have increased sharply in recent years. From 2003, the upward trend in equity prices is very clear in most countries. In Indonesia, Korea, Philippines, and Malaysia, stock prices increased steadily from 2003. In the PRC, a sharp increase started in mid-2005, while in Thailand, there was a big surge in 2003.

On the other hand, a downward trend in bond yields may be found in recent years (Figure 7). In Indonesia and the Philippines, for example, the decline in bond yields was quite substantial. In other countries, the decrease was more moderate. Note that the downward trend in bond yields only started in late 2005, which is later than the starting point of the upward trend in equity prices. This may be due to a spillover effect from equity markets. Most foreign capital flows enter through stock markets, partly because emerging East Asia has relatively less developed domestic bond markets, which are less open to foreign participation. However, as stock prices rise, expected returns on equities drop and local investors bid up bond prices, lowering yields

In addition, land prices have increased in most countries (Figure 8). In Thailand and Indonesia, they have increased by more than 50% since 2002. There has also been an upward trend in Korea from 2001, while land prices in the Philippines have increased steadily.

C. Real Exchange Rates, Money Supply, and Reserves

Figures 9 and 10 show nominal and real effective exchange rates, respectively. Recently, a clear appreciation trend is found in many countries, although the degree of appreciation varies across countries. The Korean won and the Thai baht appreciated steadily from 2003. Other currencies have appreciated since late 2005. The recent appreciation trend has also been found for real effective exchange rates in all these countries, starting in 2004 or 2005.

Table 1 shows the percentage changes in foreign exchange reserves. Foreign exchange reserves of these countries have increased rapidly in recent years. While these economies have been running sizeable current account surpluses, they have also piled up large capital inflows. The bulk of the current account surpluses and capital inflows have been sterilized and added to their reserves because these countries want to stabilize either the nominal or real effective exchange rate with the objective of maintaining export competitiveness. Although the sterilization of reserve accumulation was substantial, money supply (M2) also tended to increase sharply in some countries, which may imply that sterilization was only partial.

As evidenced by the concurrent surges in portfolio inflows, asset price increases, and exchange rate appreciation in the data, there may be substance to the assertion that a recent surge in portfolio inflows increased asset prices and added to appreciation pressures.

However, some other factors may explain asset price increases and exchange rate appreciation in emerging East Asian countries. The recovery from the financial crisis and sounder economies may have contributed. Monetary expansion and low interest rates, originating from the recession in the late 1990s and early 2000s, may be another factor. The rise against the US dollar may also be explained by the massive US current account deficit and national debt

problem, which have weighed on the US currency globally. The following section assesses the effects of portfolio inflows on asset prices and exchange rates.

IV. Empirical Analysis

A. Panel VAR Model

The effects of foreign capital inflows on asset prices using panel VAR (vector autoregression) models are examined below. VAR models provide a useful methodology: they are data-based with a relatively small number of restrictions. The empirical framework is useful in documenting empirical facts. And the effects are expected to be inherently dynamic. For example, foreign capital inflows may affect different types of asset markets with different timing. VAR models are useful in inferring dynamic effects. The panel framework is used because the sample period under consideration is relatively short.

Let's assume that an economy i is described by the following structural form equation:

$$G(L)y_t^i = d^i + e_t^i \quad (1)$$

where $G(L)$ is a matrix polynomial in the lag operator L , y_t^i is an $m \times 1$ data vector, d^i is an $m \times 1$ constant matrix, m is the number of variables in the model, and e_t^i denotes a vector of structural disturbances. By assuming that structural disturbances are mutually uncorrelated, $\text{var}(e_t^i)$ can be denoted by Λ , which is a diagonal matrix where diagonal elements are the variances of structural disturbances. The individual fixed effect, d^i , is introduced to control for the country specific factors that are not included in the model but affect each variable.

Data was pooled and estimated using the following reduced form panel VAR with the individual fixed effect:

$$y_t^i = c^i + B(L)y_{t-1}^i + u_t^i, \quad (2)$$

where c^i is an $m \times 1$ constant matrix, $B(L)$ is a matrix polynomial in the lag operator L , and $\text{var}(u_t^i) = \Sigma$.

There are several ways of recovering the parameters in the structural form equation from the estimated parameters in the reduced form equation. The identification schemes under consideration impose recursive zero restrictions on contemporaneous structural parameters by applying Cholesky decomposition to the reduced form residuals, Λ , as in Sims (1980). Note that our statistical inference is not affected by the presence of non-stationary factors as we follow a Bayesian inference (see Sims 1988, and Sims and Uhlig 1991).⁵

B. Empirical Model

In the basic model, the data vector, y_t^i , is $\{Y, P, CAP, SP, LP\}$ where Y is output, P is the log of

⁵ Specifically, we generate the standard error bands based on a Bayesian method, as described in RATS Manual. We also experimented with the difference specifications of Y , P , SP , and LP . Results do not change qualitatively.

the price level, CAP is capital inflows or portfolio inflows (as a ratio to trend GDP), SP is the log of the stock price and LP is the log of the land price.⁶ Included are CAP, SP, and LP as they are the main variables of interest. Y and P are included to control for the factors that can affect asset prices.

The factors or variables affecting domestic asset prices can be divided into three types: First, certain factors affect domestic asset prices mostly through changes in foreign capital inflows. For example, a change in the foreign interest rate changes foreign capital inflows and thereby affects domestic asset prices. Second, certain factors affect domestic asset prices mostly through channels other than foreign capital inflows. For example, an increase in the price level (which may be the result of monetary expansion) may increase domestic asset prices, but in this transmission, foreign capital inflows are not likely to play an important role. Third, there are certain factors that affect domestic asset prices, not only through changes in foreign capital flows but also through other channels. For example, a change in domestic economic conditions induces foreign capital inflows and then affects the asset prices. But a change in domestic economic conditions also influences investments by domestic investors and thereby affects asset prices.

In the basic model, we control for the second and the third types of factors to analyze the effects of capital inflows on asset prices. We include the second type of factor in the model because there may be an omitted variable bias if an important factor is not included in the model. We also include the third type of factor in the basic model. If we exclude this type of factor in the model, then all the effects of this factor, including the effects through channels other than changes in capital inflows, may be captured as the effects of foreign portfolio inflows. On the other hand, the first type of factor affects the asset prices mainly through the changes in capital inflows. Therefore, to analyze the effects of capital inflows, it is unnecessary to include this type of factor in the model.

Aggregate output is the most important variable that represents domestic economic conditions, which may affect asset prices, both through changes in foreign capital inflows and through other channels (the third type). The aggregate price level shows the nominal and monetary condition of the economy, which can also affect asset prices (the second type).

Regarding the ordering of the variables, aggregate output and aggregate price level are assumed to be contemporaneously exogenous to other financial variables in the system. The underlying idea is that real economic activities and the aggregate price level respond to changes in economic conditions sluggishly, but the financial sector reflects all the information immediately. This type of identifying assumption is suggested by Sims and Zha (2006), and widely used in other studies such as Kim (1999), and Kim and Roubini (2000).

In addition, by ordering the aggregate output and the price level before capital inflows, structural shocks to capital inflows are constructed as conditioned on the current (and lagged) aggregate output and the price level. Given the desire to control for those variables in identifying structural shocks to capital flows, this ordering is ideal.

On the other hand, capital inflows are assumed to be contemporaneously exogenous to asset prices. This type of assumption is used by Kim, Kim, and Wang (2004), Froot, O'Connell, and Seasholes (2001), and Bekaert, Harvey, and Lumsdaine (2002). In principle, stock prices can

⁶ A linear trend in GDP is assumed. Assuming different trend types, such as quadratic trend, does not significantly affect the results.

affect foreign portfolio inflows. High past returns may signal high future returns when momentum is an important determinant of expected return. Therefore, high past returns may induce foreign portfolio inflows. However, even in momentum trading, a very transitory change in asset prices is not likely to significantly affect foreign portfolio inflows. Therefore, the assumption of contemporaneous exogeneity of foreign portfolio inflows to stock price may be justifiable. On the other hand, there is not much foreign capital that directly flows into the real estate market in these economies. Therefore, the case of momentum trading is not particularly applicable to the case of land price, and the assumption of contemporaneous exogeneity of foreign portfolio inflows to land price is reasonable.

In order to make the assumption on stock price more reliable, the stock price data are constructed as an end-of-period value.⁷ Consequently, capital inflows are a flow variable that represents the activities during the period, while stock price represents the value at the end-of-period. Therefore, the assumption that other variables such as capital inflows are contemporaneously exogenous to stock price is a reasonable one.

Finally, notice that the ordering between Y and P and between asset prices does not matter when the effects of shocks to capital inflows are examined.⁸

In addition, various extended models have been constructed. First, some extended models are considered with other factors that may affect asset prices through channels other than capital inflows. The extended model is: {Y, P, X, CAP, SP, LP}, where X is a new variable. X is ordered before CAP to control for both current and lagged factors in identifying structural shocks to capital flows. The domestic short-term interest rate and capital outflows are considered as X. Low domestic interest rates may increase asset prices while capital outflows may decrease asset prices.

Second, to examine the effects on other relevant variables such as the nominal and real effective exchange rates, a new variable is added to the basic model. Because it is not clear whether capital inflows are contemporaneously exogenous to exchange rates (and vice versa), two types of models are considered with different orderings: {Y, P, X, CAP, SP, LP} and {Y, P, CAP, X, SP, LP}, where X is the nominal or real effective exchange rates.

Five countries in our model are examined: Indonesia, Korea, Malaysia, Philippines, and Thailand.⁹ The estimation period is from the first quarter of 1999 to the first quarter of 2006. Quarterly data is used.¹⁰ The period prior to 1999 is excluded as economic behavior before and after the Asian crisis may be considered inconsistent within the framework of the study. A constant term and four lags are assumed.

All data series have been obtained from the International Monetary Fund's *International Financial Statistics*, with the exception of stock prices, land prices, and nominal and real effective exchange rates. Stock prices are from Bloomberg, while nominal and real effective exchange rates are from the Bank for International Settlements. Land prices have been obtained from the Bank of Korea webpage for Korea, ADB for Philippines, and Gochoco-Bautista (2007) for the rest.

⁷ Using daily stock price data, the stock price at the last date during the quarter is constructed.

⁸ Refer to Christiano, Eichenbaum, and Evans (1999).

⁹ Sufficient data series are not available for other economies.

¹⁰ Some variables such as capital inflows are unavailable monthly.

C. Empirical Results

Figures 12 and 13 report the impulse responses of each variable with one standard error band (68% probability bands) per 10-quarter horizon. The names of shocks are reported at the top of the graph in each column. The names of responding variables are reported at the far left of the graph in each row. Figure 11 shows the results for the system including capital inflows while Figure 13 reports the results for the system including portfolio inflows.

Although most interest is in the effects of capital inflow shocks—other shocks do not have much structural interpretation—some explanations of the effects of other shocks are provided to understand the general picture. Positive shocks to RGDP and PGDP tend to increase asset prices over time. PGDP shocks have a very strong effect on asset prices while RGDP shocks have a weak effect. These two factors are included to control for the factors that affect asset prices possibly through channels other than portfolio inflows. Indeed, because these factors are found to significantly affect asset prices, at least some factors are controlled. On the other hand, these two shocks do not seem to affect capital flows or portfolio flows strongly. Therefore, these two shocks can be inferred to affect asset prices without changing capital inflows much, that is, mostly through channels other than capital inflows.

Then the effect of a positive shock to capital flows is examined, which is the main interest. To infer the nature of capital flow shocks, the responses of capital flows are examined first. Capital flows increase by 4% of trend GDP on impact. In the next quarter, the surge in capital flows decreases, but capital flows still increase by about 0.6% of trend GDP, and this modest surge continues over the next 2 years or so.

In response to capital flow shocks, the stock price increases for 3 quarters. The increase in stock price is about 2–3% for the first 3 quarters. The land price also increases, but in general, the increase is more delayed than the increase in stock price. Land price increases about 1% on impact, and it further increases up to 3 quarters after the shock, and then decreases back to the initial level. The maximum effect of the 1.5% increase is found in the 3rd quarter after the shock.

The effect of portfolio inflows on asset prices is similar on the whole, but the effect seems to be weaker. Stock price increases on impact by about 1.5%, and decreases back to the initial level in 3 quarters. The land price increase is delayed, and the maximum effect, about a 1% increase, is found in about 5 or 6 quarters after the shock. These weaker effects seem to be related to the nature of portfolio inflow shocks. Portfolio inflows increase at about 2.5% on impact and decrease back to the initial level in the next period. That is, shocks to portfolio inflows are smaller and less persistent, which may explain why the effects of portfolio inflow shocks on asset prices are weaker than those of capital inflows.

It is also interesting that neither capital inflow shocks nor portfolio inflow shocks affect domestic output and price much; the responses of output and price level are not significantly different from zero with 68% probability. Finally, positive shocks to asset prices increase capital inflows and portfolio inflows, although the effect is not so strong. Higher asset prices may attract foreign investors and induce capital inflows.

To further confirm the above results, extended models were projected that additionally included domestic short-term interest rate or capital (or portfolio) outflows. Figure 15 reports the effects of capital inflows (or portfolio inflows), shocks on capital inflows (or portfolio inflows), stock prices, and land prices. ‘CAP-R,’ ‘CAP-OUT,’ ‘PORT-R,’ and ‘PORT-OUT’ stands for the model with capital inflows and short-term interest rates, the model with capital inflows and capital outflows,

the model with portfolio inflows and short-term interest rates, and the model with portfolio inflows and portfolio outflows. In these, the results are qualitatively similar to those of the basic five-variable model.

Second, we examine the effects of capital (and portfolio) inflow shocks on real and nominal effective exchange rates using the extended model that includes the real or nominal effective exchange rates. The results for the models with the real exchange rates are reported in Figure 15. The name of the type of shocks (either capital inflow shocks or portfolio inflow shocks) and the name of the responding variable (either nominal effective exchange rate [NEER], or real effective exchange rate [REER]) are defined at the top of each graph. Positive capital inflow shocks lead to real and nominal appreciation, which is different from zero with 68% probability in all specifications. The effects of portfolio inflow shocks are weaker, but nominal and real exchange rates tend to appreciate in all cases. Also, note that in most cases the responses of the nominal effective exchange rates are very similar to those of the real effective exchange rates, which suggests that real appreciation is mostly induced by nominal appreciation.

In summary, a surge in capital inflows or portfolio inflows has positive effect on asset prices. Stock prices increase immediately as capital inflows hit directly. The land price increase is more delayed, which may be explained by a spillover effect. The real effective exchange rate appreciates, which is mostly explained by a nominal appreciation.

However, the effects of capital inflows on the macro-economy seem to be limited, showing that output and the aggregate price level do not respond much.

Next, the extent variation in asset prices is explained by capital inflow shocks is looked at by applying forecast error variance decomposition to asset prices. Table 4 reports the results for the basic empirical models. Portfolio inflow shocks explain no more than 5% of stock price and land price fluctuations in any horizon within 8 quarters. The contribution of capital inflow shocks is larger, but still not very significant. Capital inflow shocks explain less than 8% of stock price fluctuations in any horizon within 8 quarters. They explain less than 14% of land price fluctuations in any horizon within 8 quarters as well. Based on these results, although capital inflows affect asset prices significantly, it might be difficult to argue that the recent asset price surge in these emerging East Asian countries is mostly due to the recent increase in capital inflows. However, the estimation period does not include the most recent dates when asset price appreciation accelerated and serious concerns about capital flows emerged. If a more recent period is included, the role of capital flow shocks is likely to increase. In addition, whatever the exact contribution of capital inflow shocks to variations in asset prices, policymakers should pay attention to current asset price increases which have been very rapid in recent years.

Finally, capital inflows surge in these emerging East Asian countries, and the empirical results suggest that capital inflow shocks do have some responsibility for the rise in asset prices in recent years. Therefore, the next question is whether the current surge in capital flows may destabilize macro-economies, as occurred during the Asian crisis. However, although a devastating crisis is less likely to occur now compared with the late 1990s, we cannot entirely exclude the possibility. First, the nature of the capital inflows is different. In the 1990s, a large portion of the surge in capital inflows was short-term debt, while an increase in foreign portfolio inflows has been a major part of inflows in recent years. Second, exchange rates were more tightly controlled in the 1990s. Today these countries apply more flexible exchange rate arrangements. Third, crisis-affected countries (for example, the PRC and Korea) have built up massive foreign exchange reserves and have organized a system of regional cooperation since

the financial crisis. Fourth, banking and financial sectors have been strengthened and many structural reforms implemented. In addition, the empirical results show that capital inflow shocks do not significantly boost the macro-economy, which may imply that the boom-bust cycle theory is less likely in the current situation.¹¹

V. Policy Considerations

Emerging economies in Asia are using a variety of policy measures to deal with large capital inflows, including mitigating currency appreciation pressure by sterilization, prepaying foreign debt, encouraging capital outflows, and tightening credit growth by increasing lending rates and required reserves.

A. Increasing Exchange Rate Flexibility

One way to enhance monetary autonomy is through the implementation of a floating exchange rate regime, which gives monetary authorities greater flexibility to handle fluctuations in monetary aggregates resulting from fluctuations in capital flows. The central bank may also intervene in the event of a capital flow reversal, curbing financial instability as a safety-net lender.

The effects of capital inflows may vary depending on the exchange rate regime. Real exchange rate appreciation pressures may increase under floating- and fixed-exchange rates, but the adjustment under a floating regime is more direct and less costly. This reflects the different measures available under each type of regime: under a fixed regime the primary adjustment measure is a rise in inflation which naturally occurs as inflows stimulate domestic activity; under a floating regime, nominal exchange rate appreciation can be executed to augment adjustment. This also discourages inflows by reducing return in terms of foreign currencies. On the surface, adjustment under a floating regime tends to be less stable because of the use of the nominal exchange rate; however, the effects of these measures may be less detrimental in larger and deeper financial markets.

Since the Asian financial crisis, most emerging economies in East Asia have moved toward more flexible exchange rate regimes (Kim, Kim, and Wang [2007], Kim (2006)) from pegs of varying degrees to the US dollar before, as the crisis-affected economies moved toward liberalization. Some have argued, such as in Kawai (2002) and Ogawa and Yang (2006), that as the crisis waned some economies moved toward a rigid fixity because of difficulty maintaining freer exchange rate regimes. Nevertheless, current exchange rate arrangements in East Asia differ from the pre-crisis era and vary across the region: a hard peg in Hong Kong, China; limited flexibility in the PRC and Malaysia; relatively flexible regimes in Korea, Thailand, and Indonesia; and a mostly free-floating regime in Japan.

Moving toward more flexible exchange rate regimes enhances monetary maneuverability in a world of rising and volatile capital flows. However, greater exchange rate flexibility alone cannot cool an overheating economy or prevent the development of asset bubbles—it is one, but not the only available tool.

¹¹ See Kim, Kim, and Wang (2004, 2005), who show that capital flow shocks affected macroeconomic conditions significantly in 1990s.

For those economies that still maintain a highly-managed exchange rate, there is also the issue of how to make an orderly transition to a floating exchange rate regime. History tells us that more than half of such efforts have been disorderly and have fueled crises. Experience suggests that the following, general components are important for a successful exit from a fixed regime: (i) a deep and liquid foreign exchange market; (ii) a coherent policy governing central bank intervention in the foreign exchange market; (iii) an appropriate alternative nominal anchor to replace the fixed exchange rate; (iv) effective systems for reviewing and managing the exposure of the public and private sectors to exchange rate risk; (v) a gradual transition where possible; and (vi) a strengthening of fiscal policies, institutions, and banking systems.¹² For economies moving from highly-managed to floating exchange rate regimes, preparation is crucial.

B. Monetary Policy

One way of dealing with capital inflows is to lower interest rates, which tends to reduce inflows and appreciation pressures by making interest arbitrage less attractive. However, cutting interest rates may further boost liquidity and add inflationary pressure, making this option less attractive when inflation is already high. At the same time, if asset prices are increasing, lowering interest rates may cause asset price bubbles.

On the other hand, how monetary policy reacts to asset prices is highly controversial in general, both from an academic point of view and from a policy perspective. And there is wide debate about whether monetary policy should target asset prices at all. The arguments against suggest that (i) it is hard to determine the existence of an asset bubble *ex-ante*, and thus, targeting asset prices may destabilize the economy; (ii) to deflate an asset bubble, large hikes in interest rates may be required, leading to a substantial economic recession; and (iii) if a bubble bursts, monetary authorities can respond quickly by providing liquidity and thus prevent a severe decline in asset prices—dubbed the “Fed-view” in Roubini (2006)—making a preemptive monetary policy that targets asset prices unnecessary.¹³ Nonetheless, several authors suggest that central banks should target asset prices as well as inflation and output gaps. Filardo (2001, 2004) argues that the optimal monetary policy rule implies that asset prices generally enter into the reaction function of the monetary authority. If there were a rising bubble, monetary policy would be tighter than under a simple Taylor rule, while, when the bubble bursts, optimal policy would be easier than under the Taylor rule. Others also insist that highly leveraged asset acquisition fueled by excessive credit creation and asset misallocation may occur even when inflation is low. A monetary authority which focuses on the mean inflation rate alone may thus miss growing financial imbalances (Borio and Lowe (2002, 2004)).

It is not obvious that emerging East Asian economies should implement monetary policies that target asset prices in general. However, Gochoco-Bautista (2007) shows that asset price booms matter in East Asia because they affect the probability of adverse macroeconomic developments, and insists that preemptive monetary policy is required to deal with asset price appreciations in the region. In addition, recent experience in the United Kingdom, Australia, and New Zealand suggests that it is possible to react to the formation of bubbles with a moderate and gradual monetary policy tightening—without causing a financial and economic crash.

¹² Refer to Eichengreen (1999) and Duttagupta, Fernandez, and Karacadag (2005).

¹³ See Mishkin (2007). Exponents of the Fed-view include Schwartz (2002), Bernanke and Gertler (1999, 2001), Gilchrist and Leahy (2002), and Goodfriend (2003).

The Bank of Korea (BOK) tightened monetary policy in 2006 to moderate housing prices, raising its benchmark call rate from 4.25% to 4.50% in August of that year. Inflation pressures persisted then due to economic recovery and high oil prices. But this implies that even if the BOK is not targeting asset price appreciations directly, it is indirectly considering the potential inflationary pressures.

The PRC has also recently responded to rising asset prices in the real estate market, where prices were up 5.5% in 2006 from already very high levels. The government has tried to cool the real estate boom with a series of measures, including increasing interest rates for loans and the minimum down payments for home buyers, and restricting property investment by foreigners. New fee and tax policies were also adopted, including a new land-use fee applied to construction and land newly converted from agricultural or unused land, a 5.5% capital gain tax on residential property sold within 2 years of purchase, and a land value-added tax for real estate development enterprises.

However, monetary tightening is a limited policy option in the emerging East Asian economies, because higher interest rates can induce more portfolio inflows and add to liquidity expansion. At the same time, exchange rates will also appreciate. This reduces export price competitiveness.

In the presence of strong external inflows, many economies use sterilized foreign currency market intervention to neutralize appreciation pressures on the exchange rate. Sterilized intervention may not be completely effective, however, leading to increased domestic liquidity that can feed into asset markets. Even if ineffective, sterilized intervention has some important effects on domestic asset markets. First, domestic interest rates will be higher than otherwise. With inflows into domestic bond markets, interest rates would tend to fall but sterilization will at least partially offset the drop. Thus, any gap between foreign and domestic interest rates will persist, encouraging capital inflows to continue. Second, sterilization increases outstanding domestic government bonds, which may increase the size of public debt. This can undermine the credibility of macroeconomic policy, setting up a potential reversal in capital flows. Third, with sterilization, the monetary authority increases the holdings of foreign currency assets, but decreases the holdings of domestic government bonds. This can be very costly because the domestic bonds are likely to provide higher interest payments than foreign currency assets. Fourth, sterilized intervention may hamper further financial reforms. Commercial banks would hold up the central bank debts. To cut the cost, a lower interest rate may be applied to the debts. It may eventually increase the burden of commercial banks or become a control over domestic interest rates.

The monetary authority may increase reserve requirements or the discount rate to prevent the increase in money supply from reserve accumulation. However, these policies also have some problems: they can be viewed as increased regulation on financial markets—countering financial market liberalization. And they could distort the banking system, for example, if participants use counterproductive ways to bypass the regulations.

The PRC has put in place several measures related to reserve requirements and discount rates. The excess liquidity can be traced to the government's intervention in the foreign exchange market and the credits extended through an inefficient banking sector. The PRC's growing concern about excess liquidity in the financial system was clearly reflected in the People's Bank of China's (PBC) decision to raise the reserve requirement ratio and the lending rate. The PBC implemented a combination of policy instruments, strengthened guidance on credit policy, and enhanced communication with financial institutions through window guidance to help them meet

state requirements on macroeconomic management, reasonably controlled credit growth, and an adjusted lending structure.

However, the PRC's efforts have not yet been successful in cooling equity markets. In 2006, stock market reforms—especially those reducing the overhang of non-tradable shares—boosted stock prices. The benchmark Shanghai Composite Index rose to 2675.47 points by the end of 2006 from 1161.06 points at the beginning of the year. That re-invigorated public enthusiasm for stocks, and funds going into mutual funds increased dramatically. The government intensified measures to ban banks from extending loans for stock investment in January 2007.

The Bank of Korea also increased the average reserve requirement ratio in December 2006, to 3.8% from 3.0%. This helped slow liquidity expansion slightly as the capacity of financial institutions to provide credit weakened.

In general, monetary policy options in emerging East Asian economies for mitigating the adverse effects of huge capital inflows are limited. And potential difficulties lie in complicated policy objectives, because of existing trade-offs between domestic and external objectives. To temper surging capital inflows, lowering interest rates may be a good option. But this will increase domestic liquidity and could foster the formation of asset bubbles. At the same time, to curtail rising asset prices, monetary tightening could be considered, but this will pressure the exchange rate and hurt exports.

Nevertheless, current asset price increases should be carefully managed by monetary policy at least in the short-run. In economies with huge gains—such as the PRC—a moderate short-term interest rate increase can help to alleviate price bubbles. A slight increase in short-term interest rates will affect credit conditions and decrease leverage and excessive risk taking by investors. This in turn affects asset prices. It also has less influence on exchange rates if the increase in interest rates is minimal. Thailand and Indonesia—where asset price gains were not as strong but inflationary pressures were high and domestic demand weak—were able to cut interest rates. It may help to limit capital inflows by closing the gap caused by the interest rate differential.

C. Capital Controls and Liberalizing Capital Outflows

In principle, capital controls can curb disproportionate amounts of unproductive capital inflows—such as a tax on inflows in a situation where domestic agents would tend to borrow heavily internationally. Capital controls may also allow monetary authorities to regain some control over policy. Nevertheless, in certain situations—for example, in economies with well-developed capital markets—such controls may prove ineffective in the long run. Agents may find new ways to circumnavigate the rules, such as rerouting inflows through other channels, thereby reducing effective control over the financial system. Liberalizing restrictions on capital outflows to offset inflows may be another option, although this may have the reverse effect and actually encourage inflows and increase investor confidence.

According to Magud and Reinhart (2006), controls on capital inflows may: (i) lead to a greater independence of monetary policy, (ii) alter the composition of capital flows in favor of longer-term investments, (iii) possibly reduce real exchange rate pressures, and (iv) have little effect on the volume of net flows. However, capital controls may also have adverse effects: they may raise domestic financing costs, reduce market discipline, lead to inefficient allocation of financial capital, distort decision-making at the firm level, and be difficult and costly to enforce (Forbes 2005). While it is true that capital controls may never be enough to completely suppress

international capital flows, at the very least they can be selectively used to suppress certain types of capital flows by raising costs.

In general, capital controls may appear as restricting the purchase of domestic financial products by nonresidents and overseas financial products by domestic residents. PRC, Indonesia, Malaysia, Philippines, and Thailand all control capital flows in many ways—especially short-term capital outflows—whereas Korea has almost completely removed restrictions on capital flows. Capital control and regulation also come in the form of restrictions on foreign financial institutions in entering domestic financial markets, and can appear as a cap on foreign equity ownership in domestic financial institutions, which can reduce competition in the domestic financial market and ensure steady profits for domestic financial institutions. Such restrictions have disappeared in advanced economies, but a good number of Asian economies still limit the access of foreign financial institutions.

There are several notable features of capital controls in emerging East Asian economies—with more restrictions on capital outflows than on capital inflows (Table 4). This is a reflection of the concern in some economies about capital flight after having experienced the Asian currency crisis. And in some economies, control on bond-related capital inflows is stronger than on stock-related capital inflows. In the PRC, foreign investment in stocks is allowed, but limited to qualified foreign institutional investors (QFII), while foreign investment in local bonds is prohibited. Korea has restricted foreign investment in the bond market more than in the stock market, compared with pre-crisis levels.

Unlike the Asian economies, openness of other economies' capital markets is rather high, with few restrictions on the purchase of financial products by foreign or domestic investors. Latin American capital markets are also less regulated, but it is notable that capital flows are concentrated to and from North American economies, and cross-relations with other regions are limited. This raises questions about why such a phenomenon occurs.

In general, capital controls do not seem to be a viable option to curb the short-term effects of capital inflows in Asia, although it might be a worthwhile way to mitigate reversals in capital flows in the long run. Thailand imposed the foreign capital reserve requirement in December 2006 in an attempt to prevent the Thai baht's appreciation from hurting exports—due to the huge increase in capital inflows from abroad. The requirement implied that foreigners bringing portfolio capital into Thailand had to deposit 30% of the funds on account at the central bank. If investors wish to withdraw their funds within 1 year, they will be refunded only two-thirds of the amount. This is a capital tax on speculative flows over a period of less than 1 year. However, it was unsuccessful in suppressing the appreciation of the baht against the US dollar in 2007.

Lifting restrictions on capital outflows by private investors in these countries may mitigate the adverse effects of huge capital inflows. Most emerging East Asian economies can further liberalize restrictions on capital outflows and achieve a greater degree of symmetry in inflow and outflow controls. As restrictions on capital outflows are lifted, private investors have access to more diversified financial assets. Furthermore, they need not pursue limited investment opportunities in the domestic market. This may reduce the upward pressure on exchange rates and prevent asset bubbles from forming in the domestic capital market. However, countries should be careful in removing restrictions on capital outflows as it may aggravate the situation should capital flows reverse.

Korea has encouraged more overseas investment by financial institutions and individuals to mitigate the negative effects of huge capital inflows into the domestic capital market. In 2007, a

temporary tax exemption for 3 years was applied to capital gains generated from overseas stock investments by domestic investment trust and investment companies. The government also eased regulations in order to boost overseas real estate investment through indirect investment. For example, the acquisition limit on overseas real estate by domestic residents for investment purposes will be raised from the current \$1 million to \$3 million.¹⁴

Given the relatively high risks involved in individual investment in emerging markets, most emerging East Asian economies encouraged authorized fund-type overseas investment by individual domestic investors. Malaysia increased the limit of holdings of foreign assets by institutional investors and investment trusts to 30% in 2005, from 10%, and raised the limit again to 50% in 2007. The PRC also implemented a set of measures to provide individual investors greater access to foreign financial assets. Individual savers are allowed to have foreign exchange and foreign exchange-linked products with domestic currency funds. In addition, individual investors can purchase foreign mutual funds up to \$20,000 through QFIIs.

D. Fiscal Policy

The government may tighten fiscal policy to calm an overheating economy to counter some of the effects of capital inflows. In addition, decreasing government spending could reduce the relative price of non-tradables and relieve the appreciation pressure on the real exchange rate.¹⁵

In East Asian economies with high inflationary pressure, a fiscal contraction may be an important option because an alternative contraction policy (that is, a monetary contraction) can cool the economy but further attract capital inflows and raise exchange rates.

Most East Asian economies have displayed a balanced fiscal position for decades. Since 1998, the average budget deficit in the six emerging East Asian economies is a mere 1.6%. The Philippines, which had shown the highest budget deficit, reduced the shortfall to 2.7% of GDP in 2005, from 5.3% in 2002. The PRC budget deficit declined from 2002 and has recently shown a small surplus, as has Korea. The other economies have kept budget deficits low. Therefore, it seems that fiscal contraction is not necessary for the sake of reducing fiscal burden. However, tightening fiscal policy will reduce the impact of portfolio inflows by contracting domestic demand, and therefore limiting inflation and real appreciation.

Nonetheless, authorities should be very careful in implementing fiscal contraction. Fiscal policy is subject to long decision lags, compared with very volatile and unpredictable capital flows. For example, by the time a fiscal contraction is implemented, the surge in capital flows might have subsided, in which case the fiscal contraction can actually worsen the situation.

Some tax policies have also been used to cool asset markets—the PRC's new tax policies on the real estate market are a case in point. In addition, in May 2007, to calm an overheating stock market, PRC authorities raised the stamp duty on stock trading to 0.3% from 0.1%. These policies affect a specific asset market, so they are different from traditional fiscal policy that targets macroeconomic conditions. At any rate, the new tax policy on the stock market had a significant short-term impact on PRC equity prices. The effect may be short-lived and the policy itself may be viewed as going against the general trend of financial market liberalization, but such policies may eventually discourage short-term trading that is an important source of short-term volatility.

¹⁴ In Korea, foreign real estate purchase by domestic residents has been permitted since May 2006.

¹⁵ See Eichengreen and Choudry (2005) for a fuller discussion of the use of fiscal policy to offset the effects of capital inflows.

E. Financial Market Regulation and Supervision

If a government cannot directly control capital inflows—and is concerned about an excessive appreciation of asset prices—strengthening financial regulation and supervision should be considered in order to prevent an unstable bursting of an asset bubble. When there is excess liquidity and lower interest rates in the market, it is highly plausible for economic agents to take risky investments. The government should access and influence risk-taking behavior in financial institutions through a range of qualitative and quantitative methods. These measures include restrictions on portfolio composition, risk-based capital requirements, loan loss provisioning, and stress testing of market-risk exposures. Any concerns can then be addressed using regulatory measures directed at specific asset markets. This will be all the more effective if a large source of funds flowing into asset markets derives from domestic agents. In general, a more targeted approach may reduce the chance of unintended macroeconomic effects of broad-based monetary, fiscal, or exchange rate policies—or even capital controls. To the extent that the banking sector is funding speculative investments in stock and real estate markets, exposures can be closely monitored or reduced through selective imposition of higher reserve requirements, higher down payment requirements for real estate purchases, or higher reserve margins for equity investments. However, effective financial market regulation and supervision requires well-trained professionals with independence, professional standards, and the ability to engage sophisticated market players. Therefore, the PRC, Korea, and Thailand, which are experiencing surges in capital inflows, should expand their risk management policies on credit expansion to equity and real estate markets.

VI. Conclusion

In recent years, emerging East Asian economies experienced (i) large capital inflows, especially a surge in portfolio inflows, and (ii) an appreciation of asset prices such as stock prices, land prices, and nominal and real exchange rates. This paper first documented the recent trend in capital inflows and asset prices in these economies, and reviewed how a surge in capital inflows can increase asset prices. The paper empirically investigated the effects of capital inflows on asset prices by employing a panel VAR model.

The empirical results suggest that capital inflows indeed contributed to asset price appreciation in the region, although capital inflow shocks explain a relatively small part of asset price fluctuations. Positive capital flow shocks increase stock prices immediately and land prices with some delay. They also cause nominal and real exchange rates to appreciate.

How to manage these capital inflows was then discussed. As yet, a one-size-fits-all solution to the problems that capital inflows present does not seem to exist. Depending on the policy objectives of individual economies, an effective mix of available options and instruments must be crafted carefully as preventative medicine to avoid disruptions caused by any external shock to the system.

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Table 1: Change in Foreign Reserve (% annual)

	1999	2000	2001	2002	2003	2004	2005	2006
China, People's Rep. of	5.7	6.7	28.1	35.0	40.2	50.6	33.7	30.1
Indonesia	16.4	7.8	-4.4	13.7	12.9	0.0	-5.6	24.1
Korea, Rep. of	42.4	29.9	6.9	18.1	28.0	28.2	5.7	13.6
Malaysia	19.7	-7.4	4.2	13.0	31.4	50.3	6.0	17.6
Philippines	43.1	-1.4	2.9	-1.1	2.4	-3.9	21.4	25.7
Thailand	18.2	-6.0	1.1	17.6	8.0	18.5	4.2	28.8

Source: *International Financial Statistics*, International Monetary Fund.

Table 2: Change in Monetary Supply (M2) (% annual)

	1999	2000	2001	2002	2003	2004	2005	2006
China, People's Rep. of	14.7	15.4	14.4	16.9	19.6	14.5	16.7	16.9
Indonesia	11.9	15.6	13.0	4.7	8.1	8.1	16.4	14.9
Korea, Republic of	5.1	5.2	8.1	14.0	3.0	6.3	7.0	12.5
Malaysia	13.7	5.2	2.2	5.8	11.1	25.4	15.4	16.6
Philippines	19.3	4.8	6.9	21.0	4.2	10.2	10.3	21.4
Thailand	2.2	3.7	4.2	2.6	4.9	5.4	8.2	6.0

Source: *Asian Development Outlook 2007*, Asian Development Bank.

Table 3: Forecast Error Variance Decomposition of Asset Prices

	Contribution of Capital Inflows Shocks		Contribution of Portfolio Inflows Shocks	
	Stock Price	Land Price	Stock Price	Land Price
1 quarter	5.5 (3.8)	3.5 (2.9)	1.8 (2.0)	0.9 (1.1)
2 quarters	4.5 (3.5)	4.1 (3.7)	1.9 (2.0)	1.5 (1.8)
4 quarters	6.5 (4.8)	8.8 (7.0)	3.0 (2.9)	2.7 (3.0)
8 quarters	7.8 (6.0)	19.8 (12.5)	4.1 (3.9)	5.5 (5.3)

Table 4: Restrictions on Capital Flows in Emerging East Asian Economies

	Restrictions on purchase locally by nonresidents				Restrictions on purchase abroad by residents			
	Stocks	Bonds	Money Instrument	Collective investment securities	Stocks	Bonds	Money Instrument	Collective investment securities
China, People's Rep. of	Yes*	Not permitted	Not permitted	Yes	Approval	Authorized banks only	Yes	Yes
Indonesia	Yes	No	Yes	Less than 1%	No	Yes	Yes	No
Korea, Rep. of	No	No	No	No	No	No	Approval	No
Malaysia	No	Yes	No	No	Approval	Yes	Yes	Yes
Philippines	Registration	Registration	Yes	No	Approval	Approval	Yes	Yes
Thailand	Yes	No	No	No	Approval	Approval	Approval	Approval

Source: *Annual Report on Exchange Arrangements and Exchange Restrictions*, International Monetary Fund, 2005
 * Yes = means at least some restrictions; No = no restrictions.

Figure 1: Trends of Gross Capital Inflows in Emerging East Asian Economies (\$ billions)

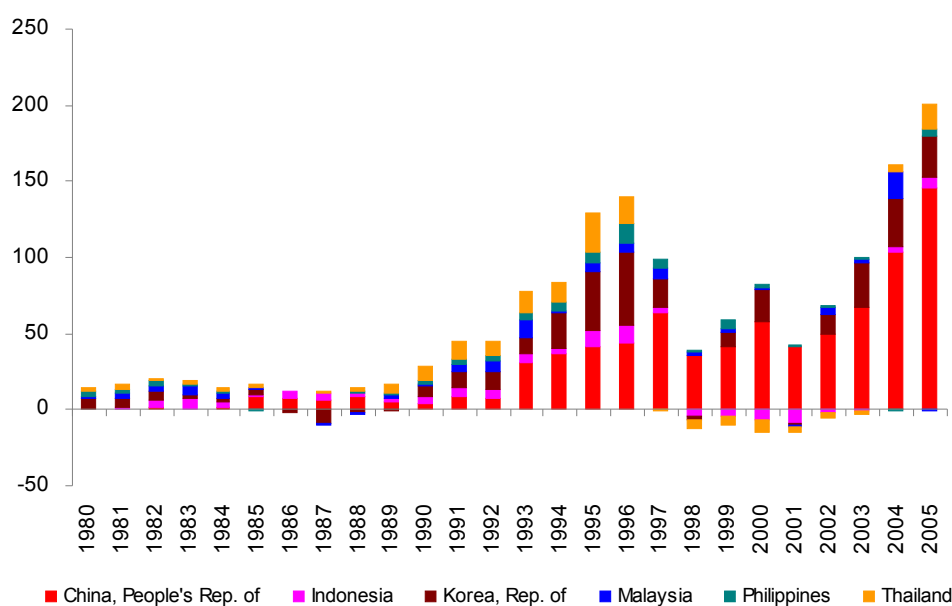


Figure 2: Emerging East Asian Economies' Gross Capital Inflows and Outflows (% of GDP)

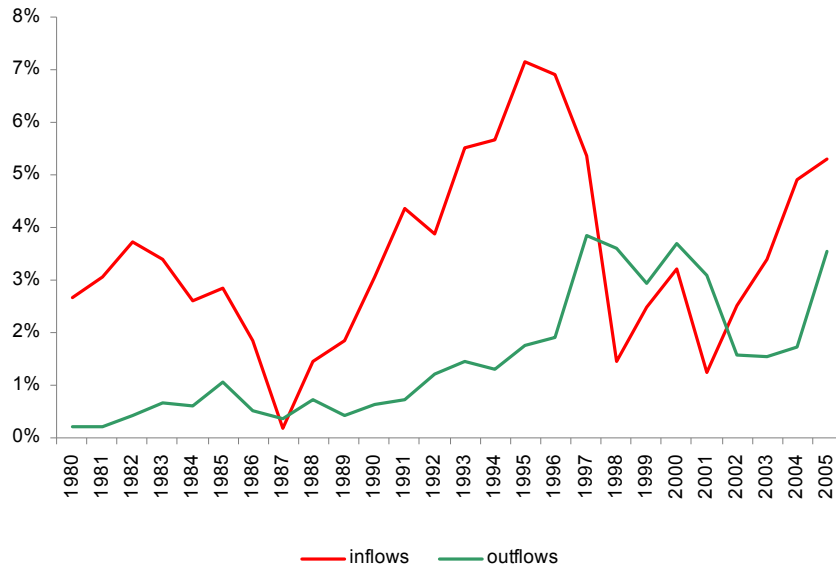


Figure 3: Patterns of Gross Capital Inflows in Emerging East Asian Economies (\$ billions)

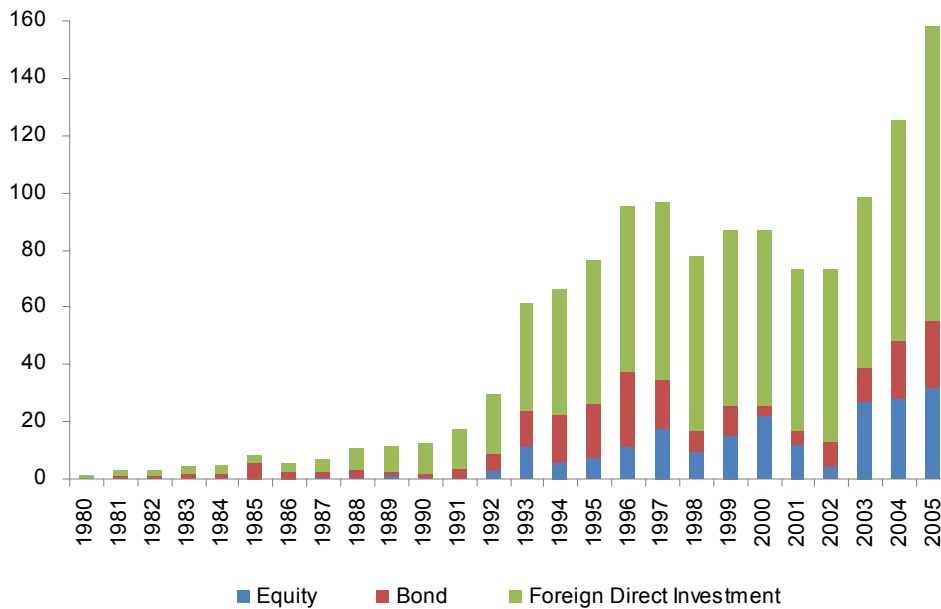


Figure 4: Trends of Gross Capital Outflows in Emerging East Asian Economies (\$ billions)

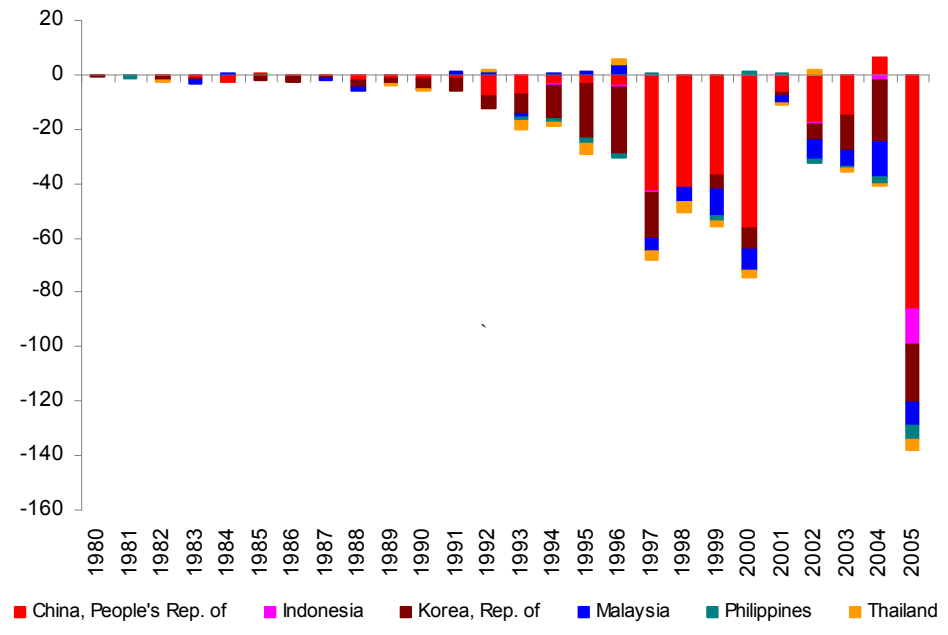


Figure 5: Patterns of Capital Outflows in Emerging East Asian Economies (\$ billions)

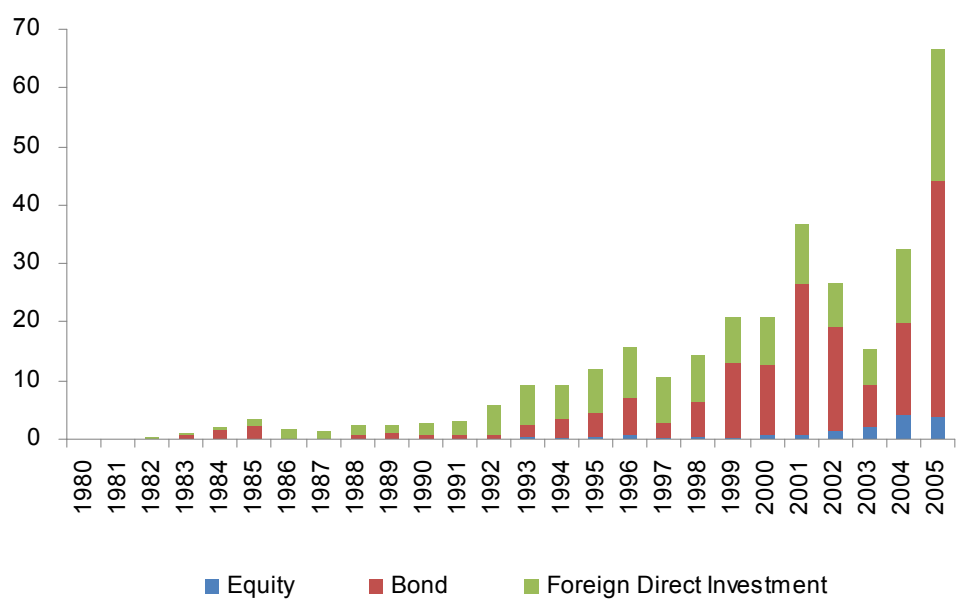
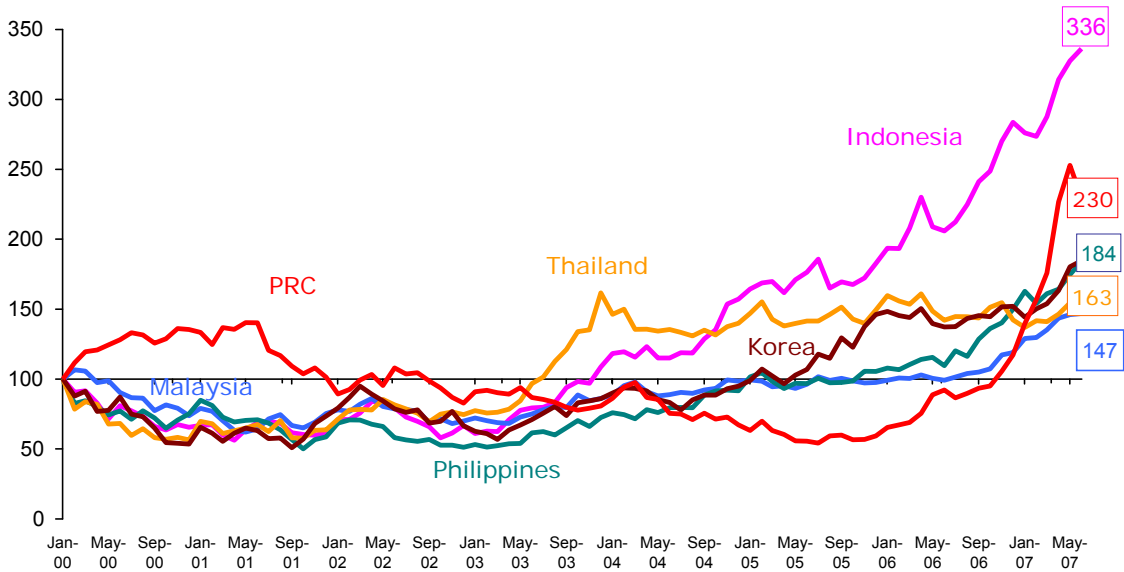
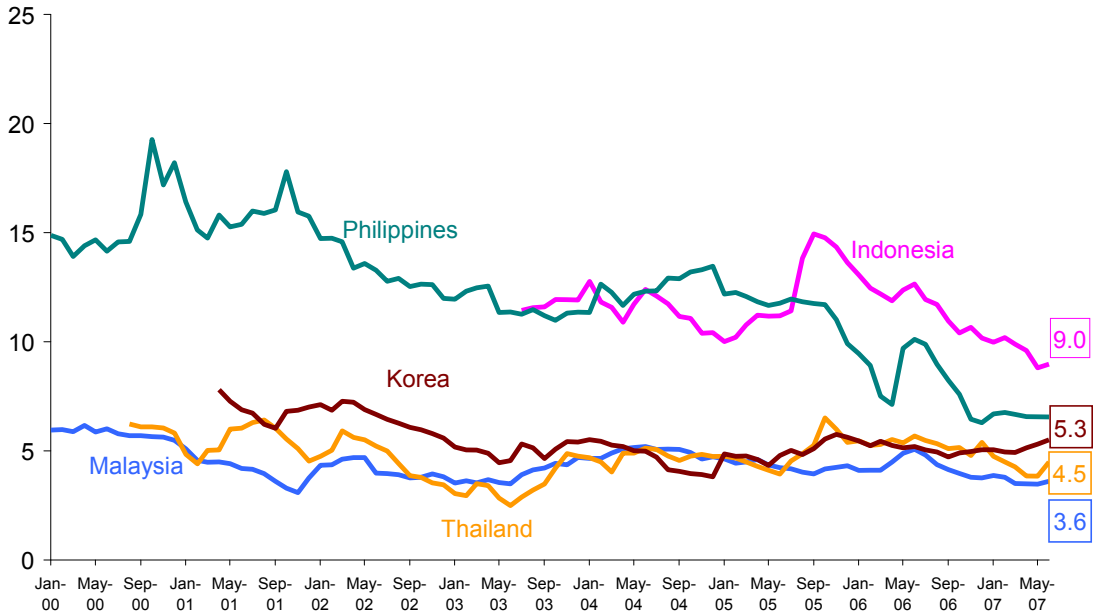


Figure 6: Composite Stock Price Indexes: ASEAN-4, PRC, and Korea



¹ Weekly average of PRC (Shenzhen), JCI (Indonesia), KLCI (Malaysia), PCOMP (Philippines), SET (Thailand)

Figure 7: 10-year Government Bond Yields



Source: Bloomberg.

Figure 8: Property Indexes for Selected Asian Economies

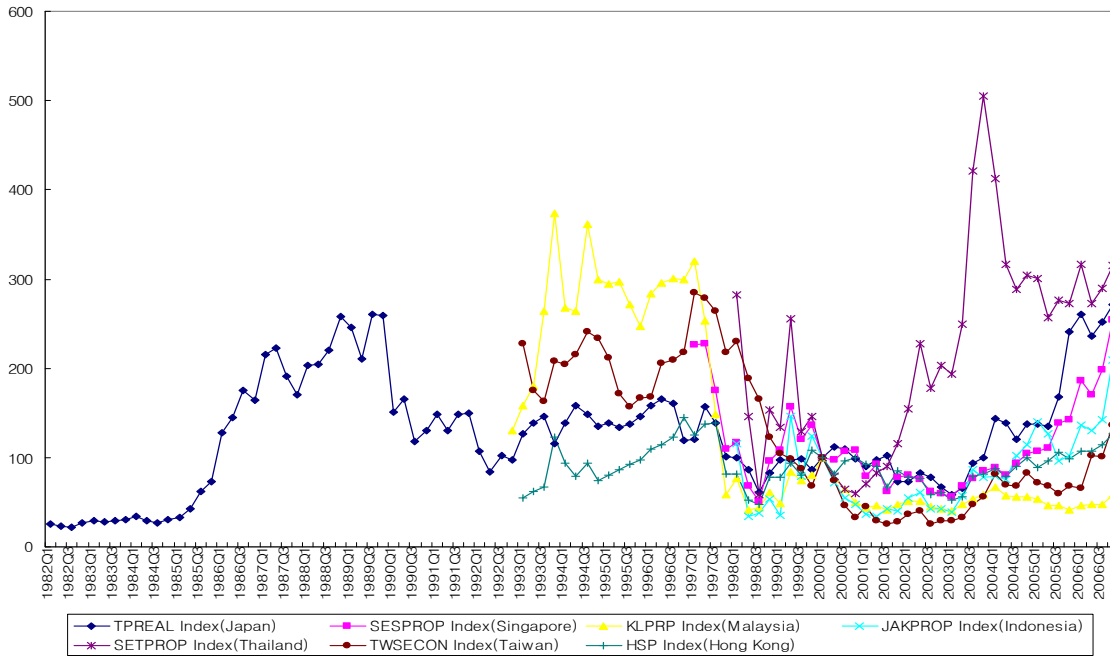
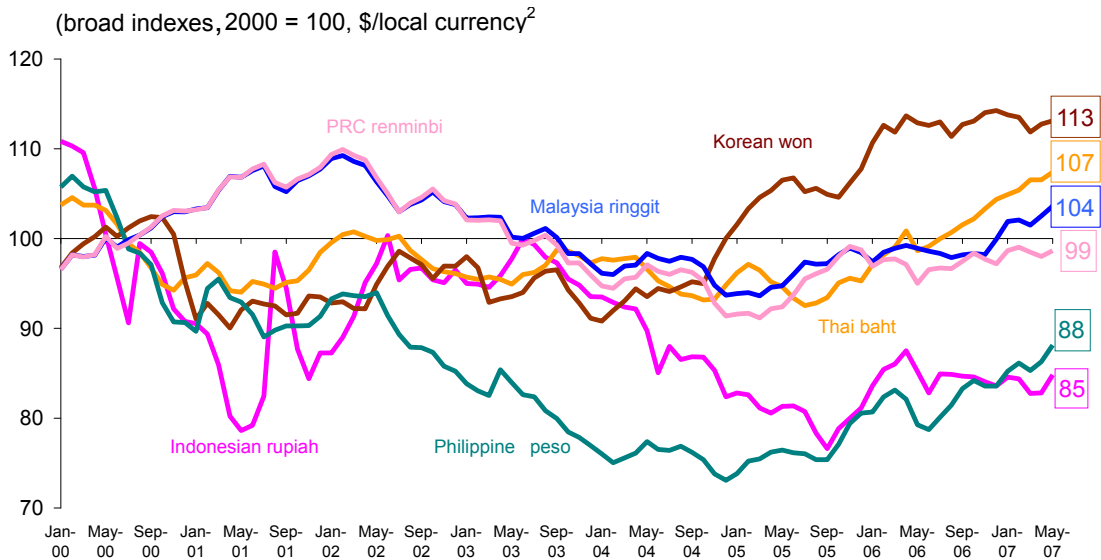


Figure 9: Nominal Effective Exchange Rate¹

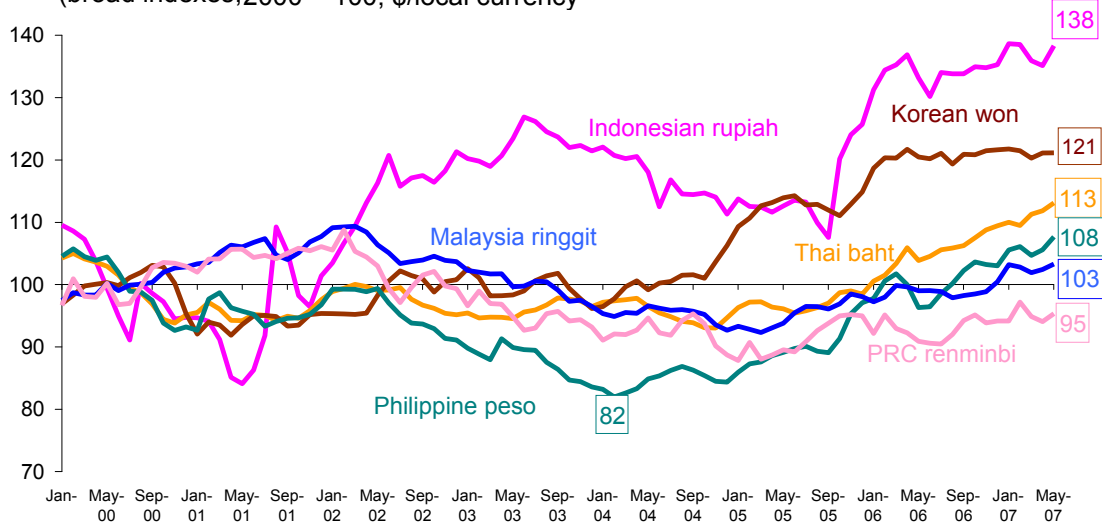


¹ Weighted average of a basket of 51 bilateral exchange rates adjusted by relative consumer prices. The weights are derived from manufacturing trade flows.

² An increase is an appreciation.

Source: Bank for International Settlements.

Figure 10: Real Effective Exchange Rate¹
 (broad indexes, 2000 = 100, \$/local currency²)

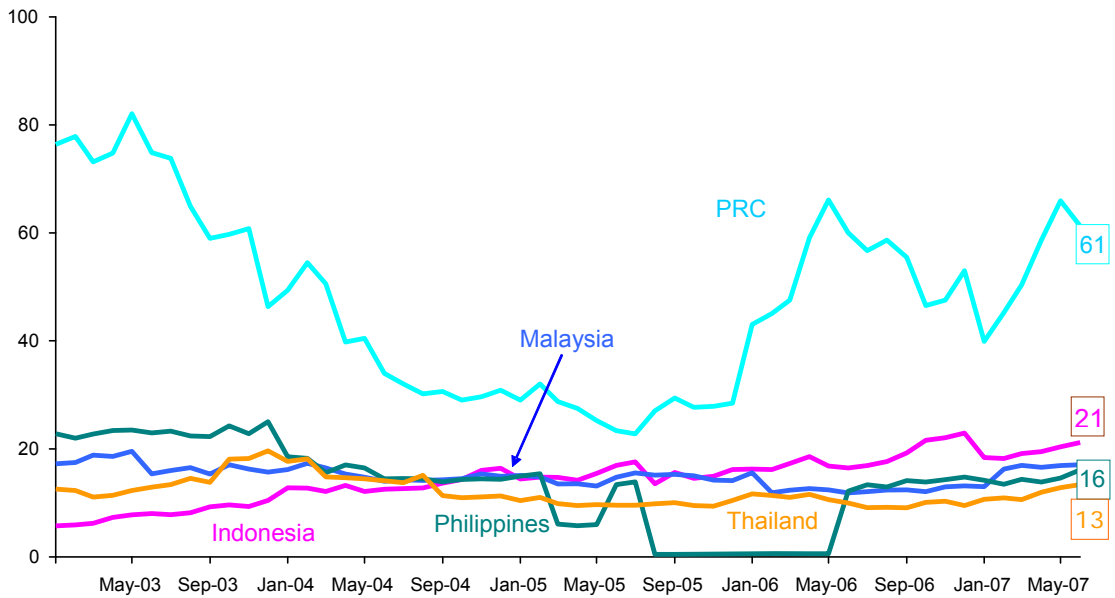


¹ Weighted average of a basket of 51 bilateral exchange rates adjusted by relative consumer prices. The weights are derived from manufacturing trade flows.

² An increase is an appreciation.

Source: Bank for International Settlements.

Figure 11: Price Earnings Ratio: ASEAN-4, PRC¹



¹ Weekly averages of JCI (Indonesia), KLCI (Malaysia), PCOMP (Philippines), SET (Thailand), and Shenzhen Composite Index (PRC)

Source: Bloomberg.

Figure 12: Impulse Responses: Basic Model with Capital Inflows

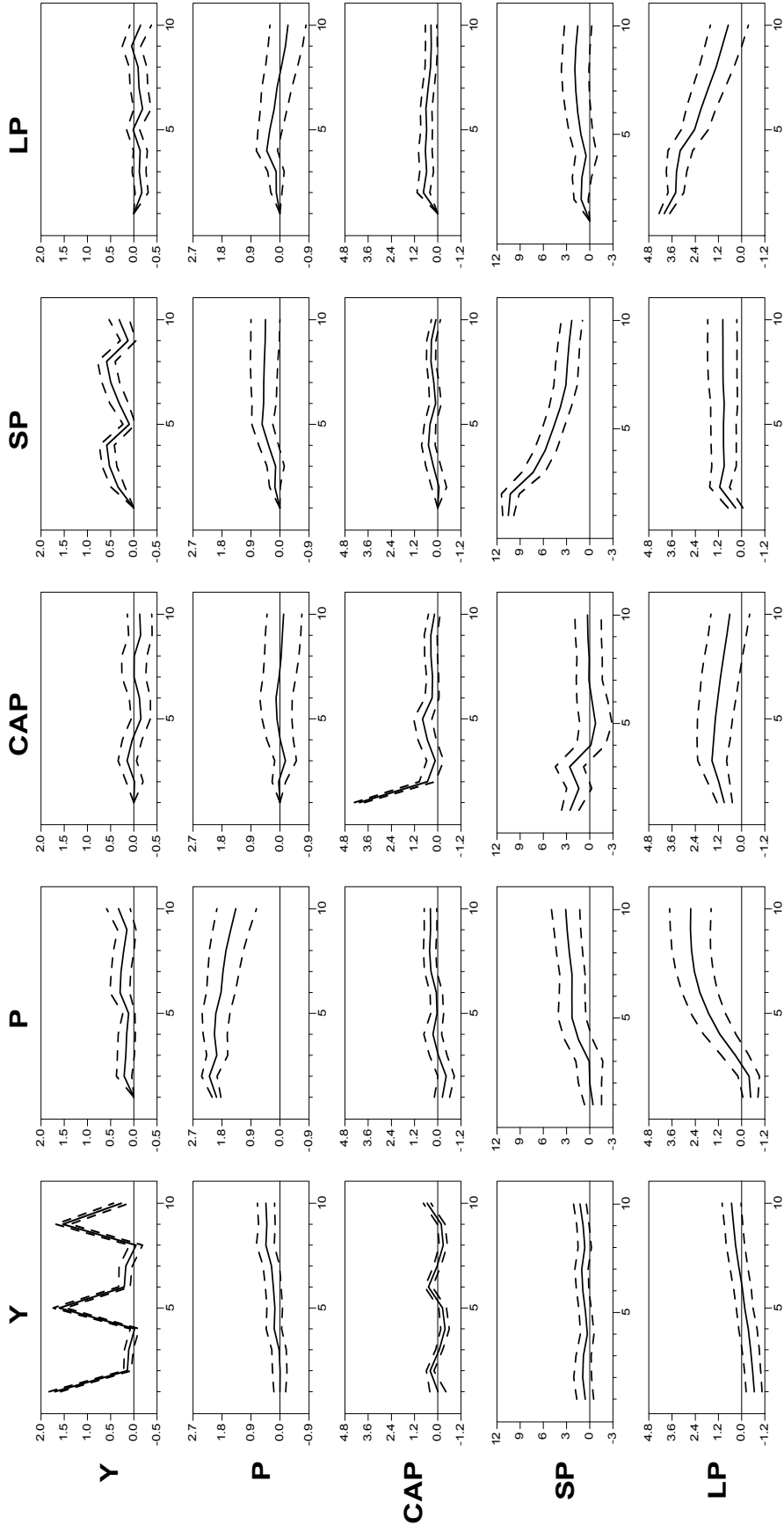


Figure 13: Impulse Responses: Basic Model with Portfolio Inflows

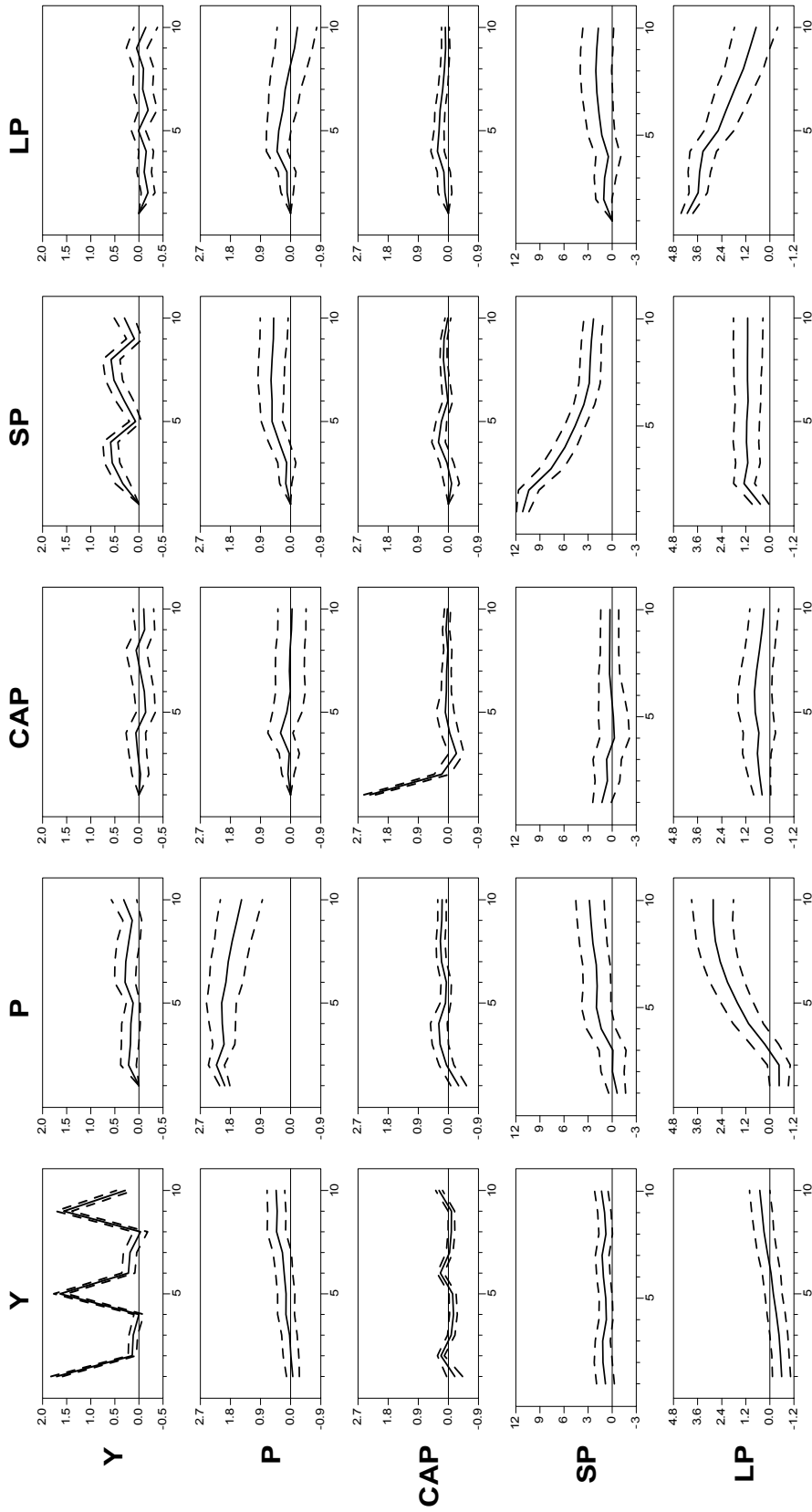


Figure 14: Impulse Responses to Capital Inflows Shocks and Portfolio Inflows Shocks:

Models with Short-Term Interest Rates or Outflows

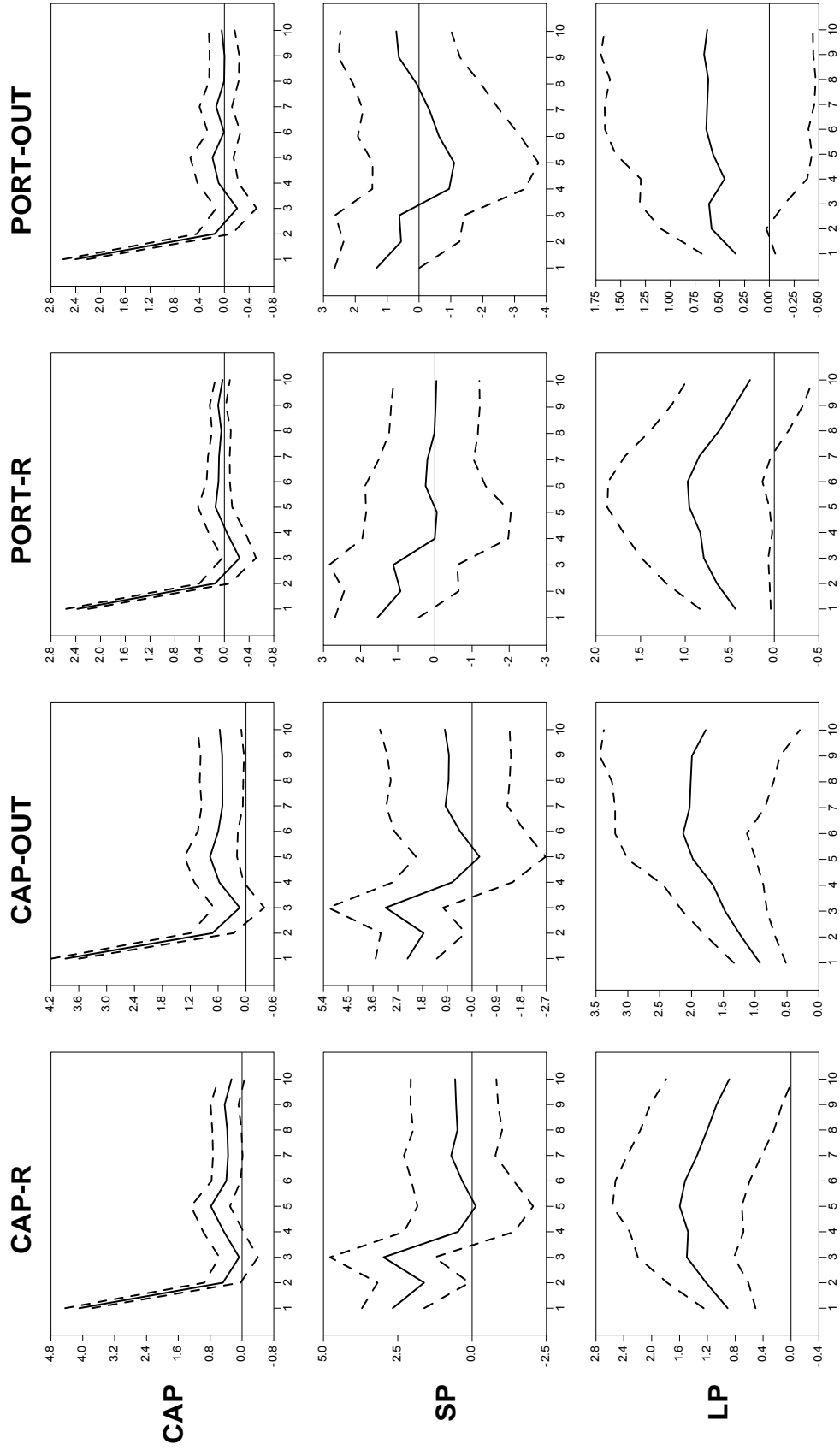
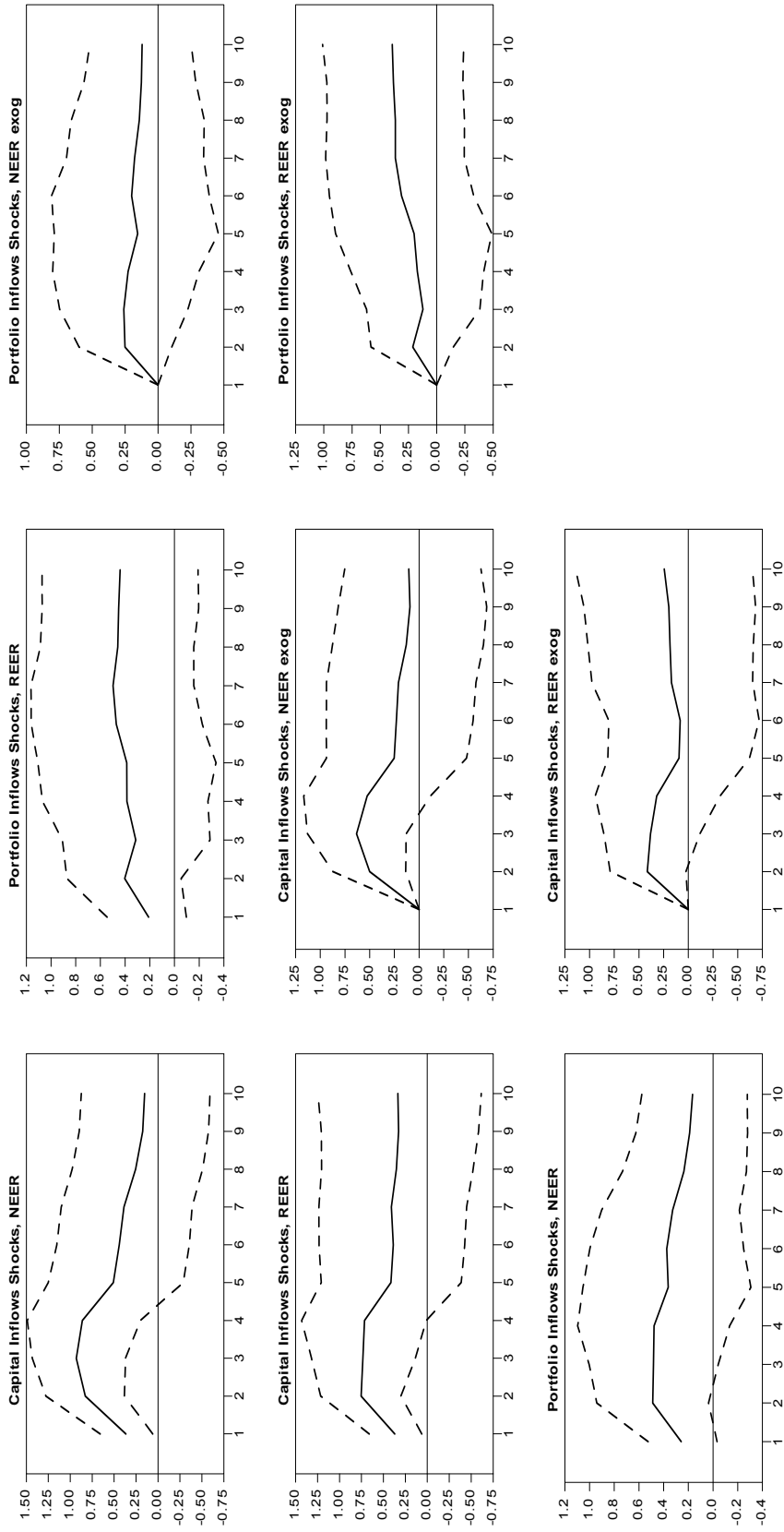


Figure 15: Impulse Responses of Nominal and Real Effective Exchange Rates to Capital Inflows Shocks and Portfolio Inflows Shocks



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ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries substantially reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to two thirds of the world's poor. Nearly 1.7 billion people in the region live on \$2 or less a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance. In 2007, it approved \$10.1 billion of loans, \$673 million of grant projects, and technical assistance amounting to \$243 million.

About the paper

Looking at surge in recent years of capital inflows into the East Asian region, Soyoung Kim and Doo Yong Yang show that this has contributed to asset price appreciation, although capital inflow shocks explain a relatively small part of asset price fluctuations.