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Asset Price Fluctuations and Macroeconomic Behavior in East Asia

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Asset Price Fluctuations and Macroeconomic Behavior in East Asia*

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1 Introduction

Over the last two decades, both the industrial and emerging economies have experienced financial liberalization and globalization. With widespread financial liberalization and increased globalization of capital markets, we have witnessed a lot of episodes of financial crisis. Financial crises have often coincided with boom and bust in credit markets, and/or asset markets (IMF, 2000, BIS, 2001). For instance, the S&L crisis in United States in late 1980s, the collapse of asset prices in Japan in early 1990s, the Asian economic crisis in 1997, and the IT boom-bust in US in early 2000s. In recent years, Asian economies have experienced boom in housing markets while the US housing market has crashed and Europe's housing markets have slowed.

Asset prices may affect the real economy through various channels (IMF, 2000). Since equities and properties constitute a significant part of households' wealth and firms' assets, their price changes affect decisions on consumption and investment, thereby affecting domestic absorption and aggregate output. Private consumption can be affected through three main channels. The first channel is via wealth effects. Households may consume much more as their net worth increase. Second, current consumption can be affected by the expectations about future income formed on asset prices. The third channel is via changes in household's borrowing capacity to finance current consumption. On the other hand, investment can also be affected by change in asset prices through three main channels. First, the firms will invest much more if the market valuation of their capital rise. The second channel is via expected future growth formed on asset prices. Third, rising asset prices will improve firm's balance sheet, and hence improve firm's ability to borrow because assets are often used as collateral.

Collaterals play an important role in credit contracts under severe asymmetric information in credit markets. Therefore, property price fluctuations may have more significant effects on macroeconomic behavior more than equity price fluctuations in emerging economies.

This paper will address the following questions for East Asian economies.

1) How were the asset price movements in East Asian economies?

2) How did the asset prices affect macroeconomic behaviors?

3) Have the asset price impacts changed recently?

4) What are the differences between property price impacts and equity price impacts?

We will investigate these questions using standard event study and VAR impulse-response analysis.

Several studies investigated the relationship between bank lending and

property price. Property price fluctuations may affect the real economy through the bank lending under the credit channel mechanism. Hofmann (2001) investigated for 16 industrial economies and found the mutual relationship for most of these economies. Several studies investigated for Asian economies (Collyns and Senhadji (2002), Gerlach and Peng (2005), Inoguchi (2007), and Liang and Cao (2007)). They investigated the relationship between bank lending and property price based on time-series analysis. However, they found the impacts of property price on bank lending and vise versa for several economies (i.e. Hong Kong, and Singapore).

The structure of this paper is as follows. The next section discusses the asset price cycles in East Asian economies. Then, we characterize the impacts of property price shocks on macroeconomic variables, and compare the outcomes with that of equity price impacts in section 3. In section 4, we characterize the relationship between asset price and macroeconomic behavior using the estimated impulse response functions based on VAR estimation. Finally, we summarize our results in section 5.

2 Asset Price Fluctuations in East Asia

In this section, we would like to identify patterns in the fluctuations of asset prices over the last two decades in 7 East Asian Economies. We will focus on property and equity as an asset. Equity price index data are obtained from IFS database. Most data on property price index are obtained from CEIC data base and/or national data (e.g. form central bank or housing bank)[1]. For the Philippines and Indonesia, we use CPI for property sub-sector as a proxy for property prices. Both asset prices are quarterly, deflated by CPI, and then transformed into natural log.

Figure 1 shows the fluctuations in both asset prices from 1979 to 2005.

2-1 Asset price fluctuations in Hong Kong, Korea, and Singapore

For 3 Asian economies, i.e., Hong Kong, Korea, and Singapore, we found cyclical fluctuations in both asset prices. In Hong Kong, property prices were decreasing from 1981, then started to increase in 1984 and reached its peak in 1997. After 1997, it had decreased continuously until 2003. On the other hand, equity prices dropped until 1995, then recovered through early 1997 only to drop again until 1998. It has recovered and reached its peak in 2000 but dropped again thereafter and continued until 2003.

In Korea, property prices were increasing from 1987 and reached its maximum

[1] Note that the definitions of property prices are not uniform.

in 1991. However, it began to drop, then, decreased even more drastically from 1997. It broke out of slump and had increased since 2001. On the other hand, equity prices began to increase form 1985 and continued until 1989. It had decreased till 1992 and recovered for a couple of years. In 1995, it had decreased seriously continuing until 1998, after which it recovered quickly.

In Singapore, property prices started to decrease in 1982, and decreased further until 1986. It has recovered after and continued to increase until 1997. It has decreased since then. Equity price cycles are shorter than property price cycles. Equity price dropped steeply in 1998 after a continuous increase since the mid 80s. It recovered immediately after 1998 only to drop again until 2003.

2-2 Asset price fluctuations in Thailand, Philippines, Malaysia, and Indonesia

For 4 ASEAN economies, i.e., Thailand, Philippines, Malaysia, and Indonesia, we can not find clear cyclical fluctuations in property prices. Generally, property prices increased from 1991, but dropped sharply in the 1997 Asian crisis, except for Philippines. Equity prices, on the other hand, also dropped immediately before or during 1997 Asian crisis.

>>Figure 1: Real property and equity prices in East Asia around here

3 Event Studies

In this section, we would like to characterize the pattern of interaction between asset market price shocks and macroeconomic variables. Following the standard event study methodology, the behaviors of key macroeconomic variables before and during an asset price busts are compared. We will also focus on the common and different features between property price impacts and share price impacts. First, we discuss the impacts of property price busts. Then, we compare them with that of share price busts that were detected in previous study (Kohsaka and enya, 2007).

3-1 Identification of the property price bust periods

As in the approach in IMF (2003), we first identify peak and trough in real property price. Then, we will define a bust as a large peak-to-trough decrease. To qualify as large, a bust in a given economy has to be in top quartile of all peak-to-trough decreases in that economy. Most property price indices are residential housing price

indices (land price index only for Thailand). We use the property price deflated by CPI.

Property price index data for 7 East Asian economies are obtained from CEIC data base, regional central bank, and/or regional housing bank. Using this methodology, we found 12 property price busts in the 7 East Asian Economies over the last two decades.[2] However, we did not include 2 bust episodes in the Philippines because the decline sizes of these two busts were much smaller compared with the other economies. In addition, we also did not include Malaysian bust in 2004 because of the data limitations. Hence, we included only 9 busts in the succeeding analysis.

3-2 Event study Results

The left side panels in Figure 2 shows the behavior of macroeconomic and financial variables before and after a peak in property prices that was followed by a bust (t=0 period). Panels in the figure include the median, the bottom and top quartiles.

>>Figure 2: Property and equity price busts around here

Our findings are as follows. Property price busts were associated with a cyclical upturn, followed by a downturn, in output and domestic absorption. The property price busts were associated with substantial output losses, where the output growth one year after the bust decreased by about 5 % from average growth rate of 8% during the 3 years up to the bust. In terms of timing, the slowdown in the output growth began immediately after the bust, and recovery started two years after the bust. We will turn to the components of domestic absorption. The slowdown in the investment was larger than the slowdown in private consumption. It may suggest that household's wealth is small, and that mortgage financial market is small in East Asian economies. The slowdown in credit growth happened later. The credit recovery also was slow.

We will compare the outcome with that of share price bust case detected by Kohsaka and Enya (2007, Figure5). The right side panels in Figure 2 are share price bust case. The IMF (2003) report claimed that bank-based economies are more vulnerable economies to asset market price busts generally and to property price busts in particular, and that property price busts tend to affect key macroeconomic variables

[2] The property price busts were Hong Kong (1981, 1997), Korea (1991, 1997), Singapore (1981, 1997), Thailand (1997), Philippines (1987, 1995), Malaysia (2004), and Indonesia (1985, 1996).

On the other hand, the share price busts identified in Kohsaka and Enya (2007) were 10 busts for 7 East Asian economies from 1975 to 2004. They were Hong Kong (none), Korea (1989, 1994), Singapore (1996), Thailand (1995), Philippines (1979, 1996, 1999), Malaysia (1983, 1997), and Indonesia (1997)

more seriously than share price busts. If these hold true, emerging market economies in East Asia are relatively vulnerable because they are bank-based. Major differences between the two busts were in the magnitudes of swings and the speed of recoveries of the key macroeconomic variables. In fact, we found that the output growth declined more sharply and immediately after the property price busts than after the share prices busts in East Asian economies. However, the magnitude of slowdown in output and investment after a property price busts are similar. The beginning of key variables slowdown after a property bust coincided with the beginning of bust itself. The recoveries of output and the components of domestic absorption after a property price bust were faster than an equity price bust.

In addition, the band between upper quartile and lower quartile of a property price bust was wider. The behaviors of key macroeconomic variables after a property bust varied widely across East Asian economies.

4 The VAR analysis

In this section, we will formally characterize the relationship between asset prices and macroeconomic variables. To investigate the impacts of asset price shocks on macroeconomic variables, we will run individual-country VARs with three or four variables: property price, equity price, and macroeconomic variables (GDP, or the components of domestic absorption), and then, we will check the impulse response of macroeconomic variables to asset price shock. We examine the two VAR models. The first model is VAR model with real property price growth (*dlrpp*), real equity price growth (*dlrsp*), and real GDP growth (*dlrgdp*). The second model is VAR model with real property price growth (*dlrpp*), real equity price growth (*dlrsp*), real private consumption growth (*dlrpc*), real investment (*dlri*). The sample of countries includes Korea, Hong Kong, and Thailand. Data are quarterly. The lag length, selected by Akaike information criterion, is 1 for Korea and Hong Kong, is 2 for Thailand.

For Korea, Figure 3a and 3b show the impulse response of each of the three variables to a shock origination from one of the three variables. To investigate the structural change effects, we divided sample periods between the first half and the later half. Figure 3a shows impulse response for the first sub-sample, while Figure 3b shows the impulse response for the later sub-sample. The first and second panels in the third row in Figure 3a and 3b, depicting the impulse response of *dlrpp* and *dlrsp* on *dlrgdp* respectively, are the most relevant.

The results indicate that the impacts of equity price and property price shocks

became stronger and more significant in the later sub-sample than in the first sub-sample. The differences in the impacts on real GDP growth between two sub-samples reflected differences in the impacts on key components of domestic absorptions between two sub-samples. Although the impacts of both equity price shock and property price shock on private consumption were not significant in the first sub-sample (the first and second panels in the third row in Figure 4a), the impacts became significant in the later sub-sample (Figure 4b). On real investment the impacts became more significant in the later sub-sample (the first and second panels in the fourth row in Figure 4a or 4b).

For Thailand, Figure 5 shows the impulse response of each of the three variables to a shock origination from one of the three variables. We estimated only in the later sample because of data limitations. The impact of property price shock on real GDP was not significant, while the impact of equity price shock on real GDP was positively significant (the first and second panels in the third row in Figure 5). The impacts of property price shock both on private consumption and investment were not significant, while the impacts of equity price shock both on private consumption and investment were positively significant (the first and second panels in the third and fourth row in Figure 6). The results indicate the impacts of property price were small and not significant even recently.

Finally, for Hong Kong, Figure 7 shows the impulse response of each of the three variables to a shock origination from one of the three variables. We also estimated only in the later sample because of data limitations. The impacts of both property price shock and equity price shock on real GDP were positively significant (The first and second panels in the third row in Figure 8). We also found the spillover effects on prices in the other asset class. The impact of property price on equity price was positively significant, and vice versa. The spillover from property price to equity price was larger and more significant than vice versa. This spillover effects may have the impacts of asset prices severer.

>>Figure 3a, 3b: Impulse Response to one S.D. for Korea: 3 variables model

>>Figure 4a, 4b: Impulse Response to one S.D. for Korea: 4 variables model

>>Figure 5: Impulse Response to one S.D. for Thailand: 3 variables model

>>Figure 6: Impulse Response to one S.D. for Thailand: 4 variables model

>>Figure 7: Impulse Response to one S.D. for Hong Kong: 3 variables model

>>Figure 8: Impulse Response to one S.D. for Hong Kong: 4 variables model

5 Conclusions

This paper examines the relations between asset price fluctuations and macroeconomic behavior. The paper presents the following results from several empirical studies for East Asian economies; (1) the beginning of output slowdown after a property bust coincided with the beginning of the bust itself, and was quicker than that after an equity bust; (2) the behaviors of key macroeconomic variables after a property bust varied widely across East Asian economies; (3) in Korea and Hong Kong, the impacts of both property price shock and equity price shock on real economy have become larger and more significant recently; (4) in Thailand, the impact of a property price shock on real economy remained limited even recently, although the impact of an equity price was significant.

How can we interpret these mixed results on the impact of property price shocks in East Asian economies? The impact of a property price may depend on the structures of financial system. It depends not only whether the economy is bank-based or market-based but also depends on the extent of mortgage loan market development as well as the size and structure of sectoral balance sheets. Financial sectors in many East Asian economies after the 1997 Asian financial crisis have shifted from lending to corporate sector to lending to household sector. Therefore, the size of household's balance sheet has expanded. The trends may increase the impact of a property price in the future. Furthermore, the progression of a globalization may make asset price fluctuations more vulnerable through the surge in capital flows. We must have more serious thought for debt management in household sector.

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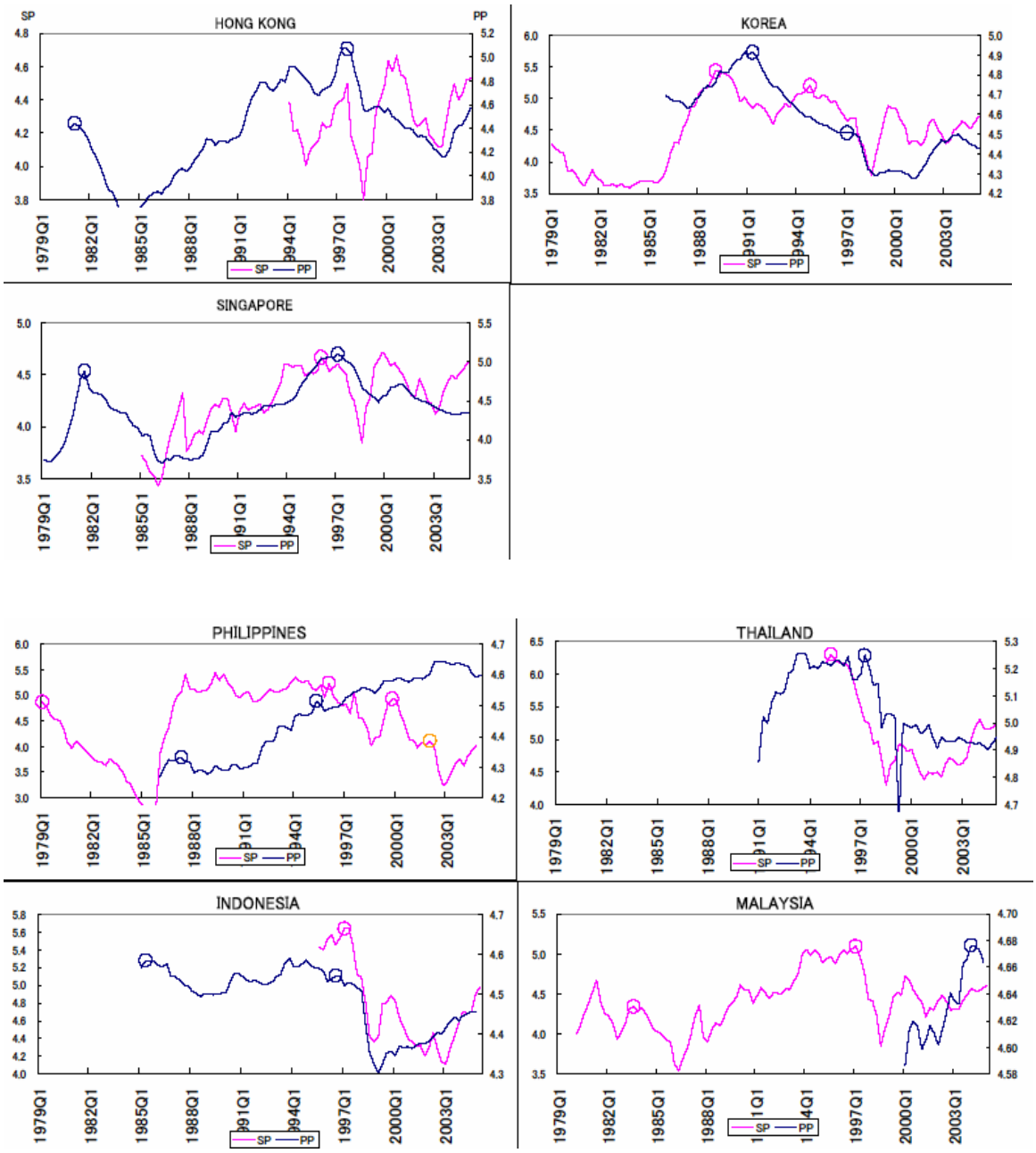
Figure 1 Real property and equity prices in Asia



Source: Hong Kong: Property Prices Index (Domestic Premise) (CEIC)

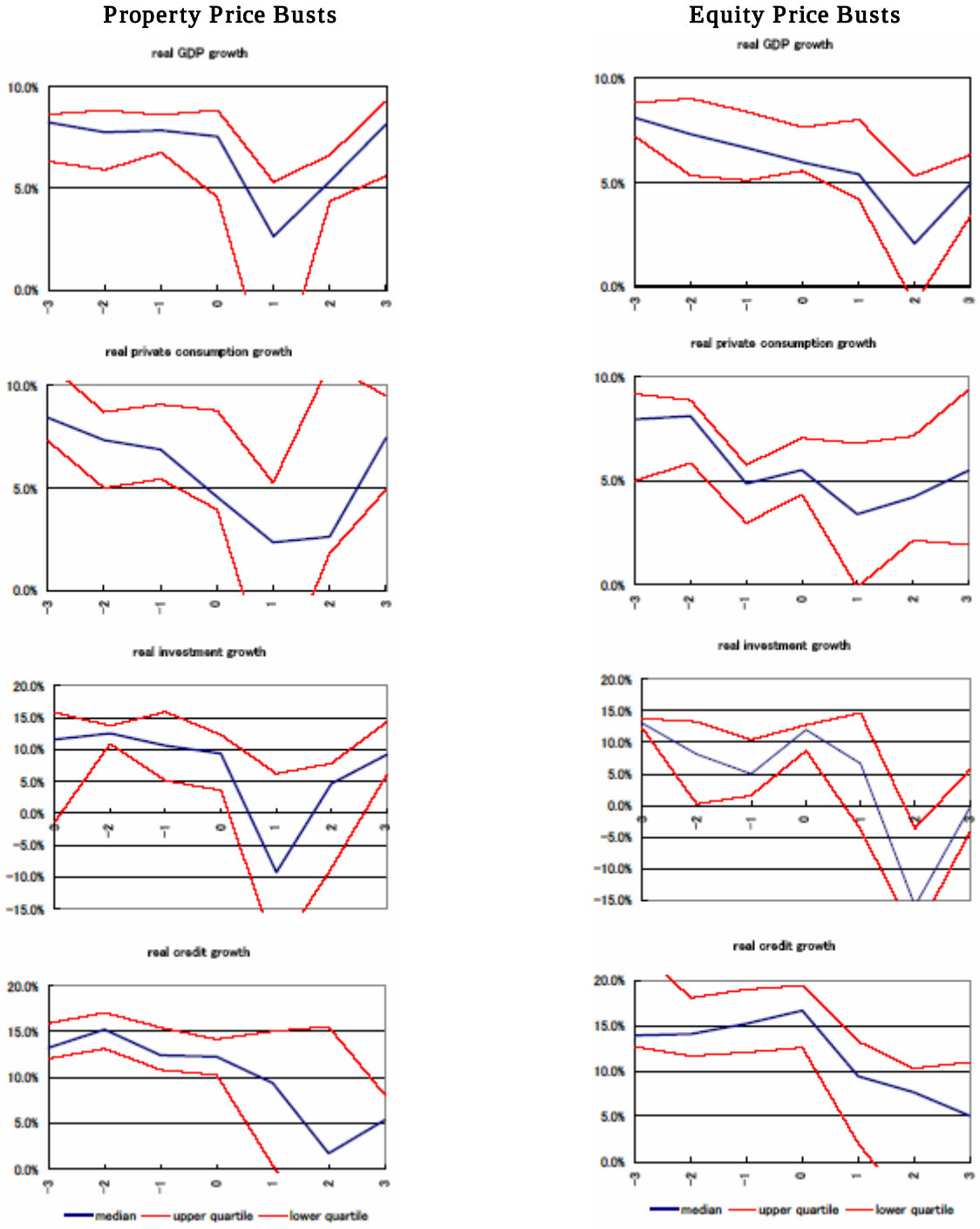
Korea: Housing price Index (CEIC)

Singapore: Property price Index (Industrial NADJ)(CEIC)

Philippines: CPI Housing (NSCB), Thailand: Housing Price Index: Land (CEIC)

Indonesia: CPI Housing (Bank Indonesia), Malaysia: House Price Index (CEIC).

Figure 2 Property and Equity Price Busts



Source: Author's calculations for property price busts. Kohsaka and Enya (2007, Figure 5) for Equity Price Busts.

Figure 3a　Impulse Response to one S.D. for Korea

3 Variables VAR (real property, equity price, real GDP): 1987Q2—1997Q3

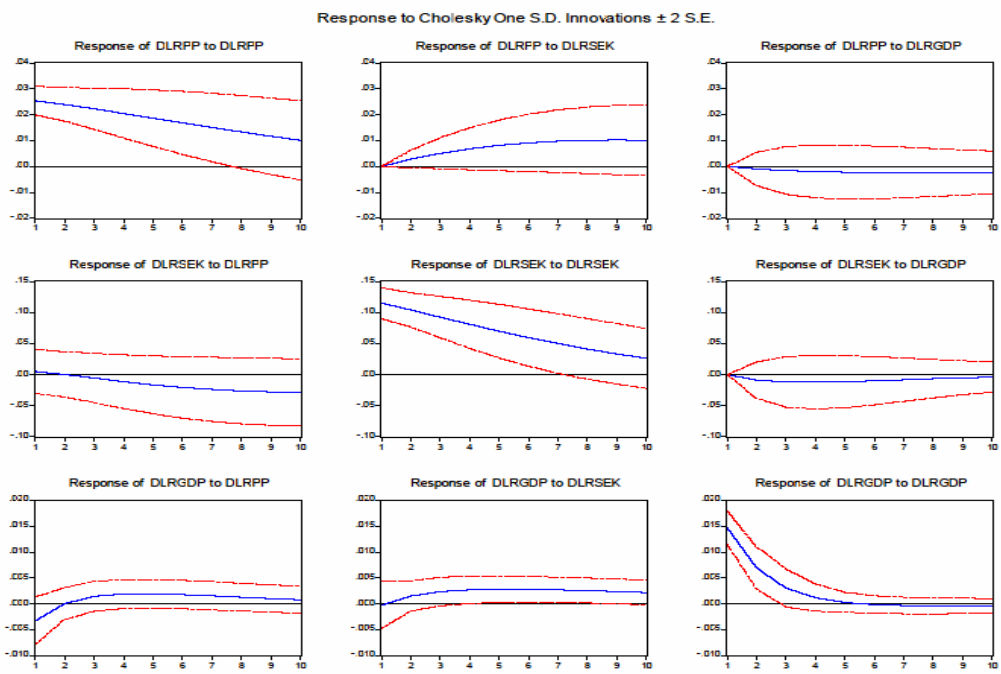
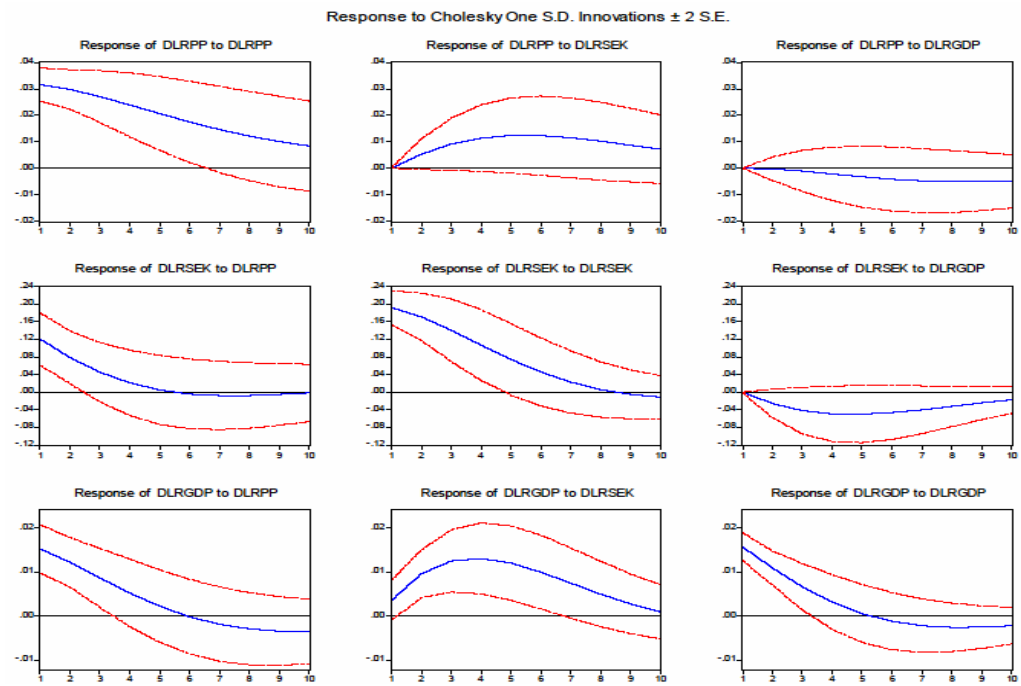


Figure 3b　1995Q1—2007Q2

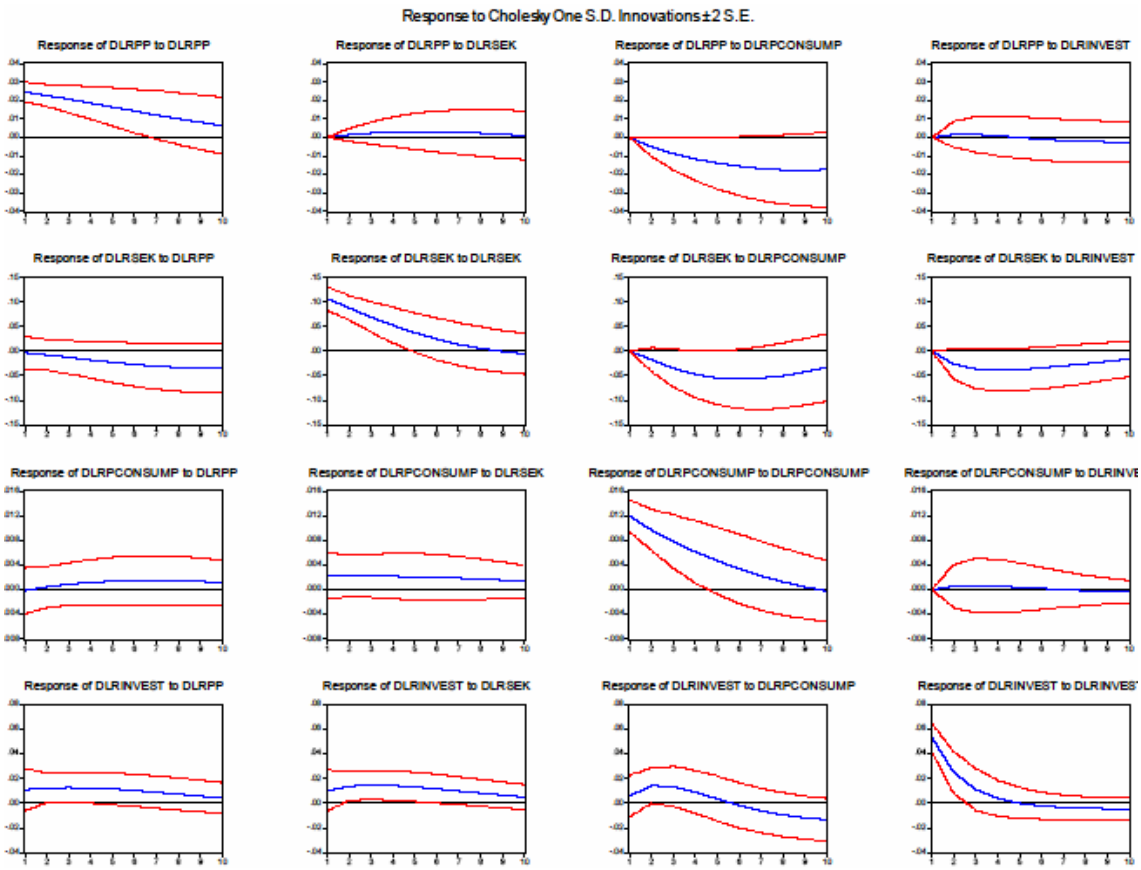


Source: Author's calculations

Figure 4a Impulse Response to one S.D. for Korea

4 Variables VAR (real property, equity price, real private consumption

, real investment): 1987Q2—1997Q3

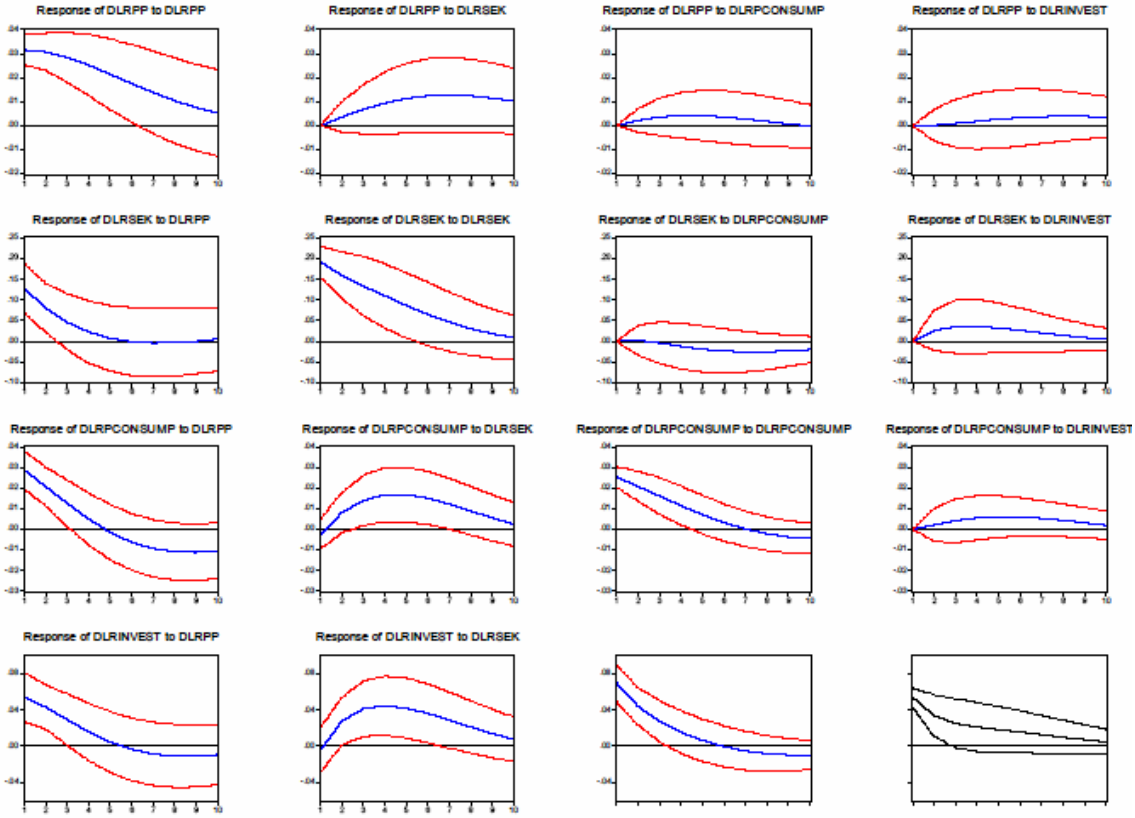


Source: Author's calculations

Figure 4b Impulse Response to one S.D. for Korea

4 Variables VAR (real property, equity price, real private consumption

, real investment): 1995Q1—2007Q2



Source: Author's calculations

Figure 5　Impulse Response to one S.D. for Thailand

3 Variables VAR (real property, equity price, real GDP): 1994Q2—2007Q3

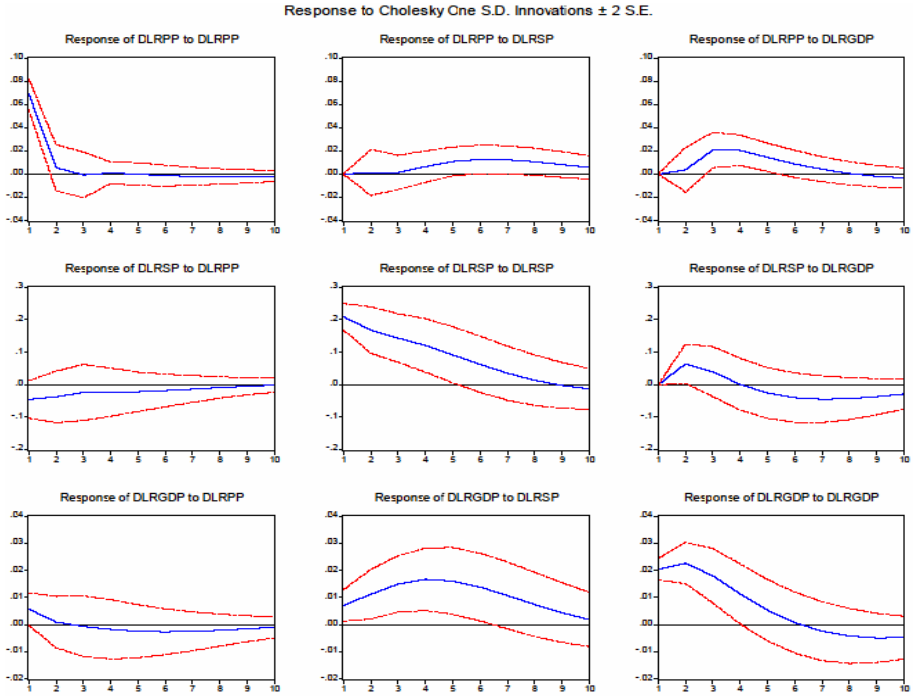
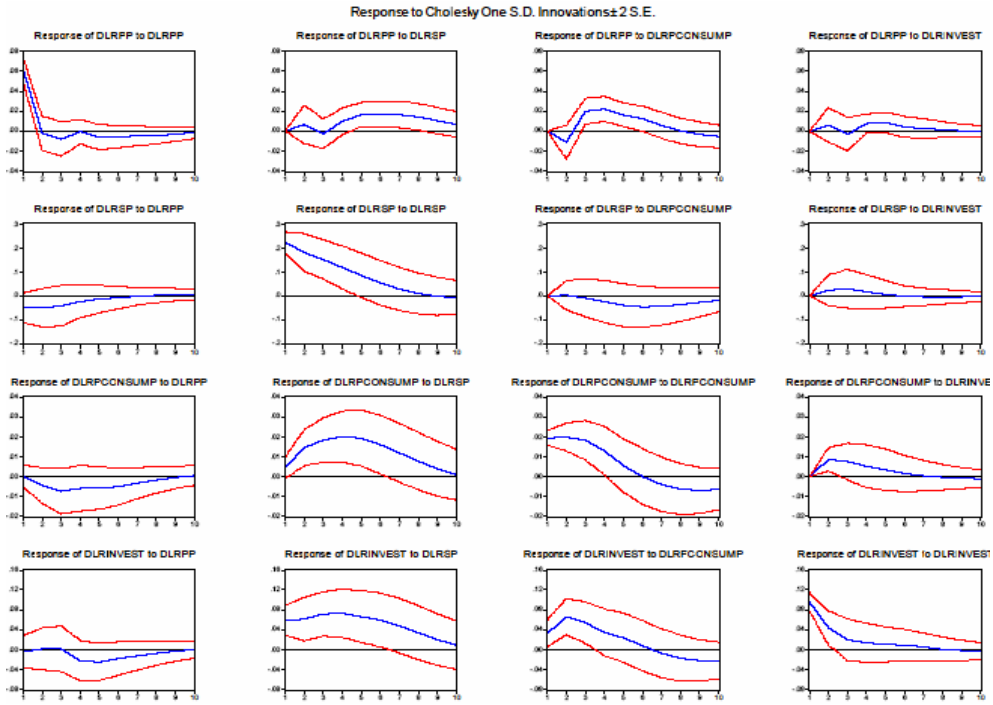


Figure 6　Impulse Response to one S.D. for Thailand

4 Variables VAR (real property, equity price, real private consumption

, real investment): 1994Q2—2007Q3



Source: Author's calculations

Figure 7　Impulse Response to one S.D. for Hong Kong

3 Variables VAR (real property, equity price, real GDP): 1995Q2—2005Q1

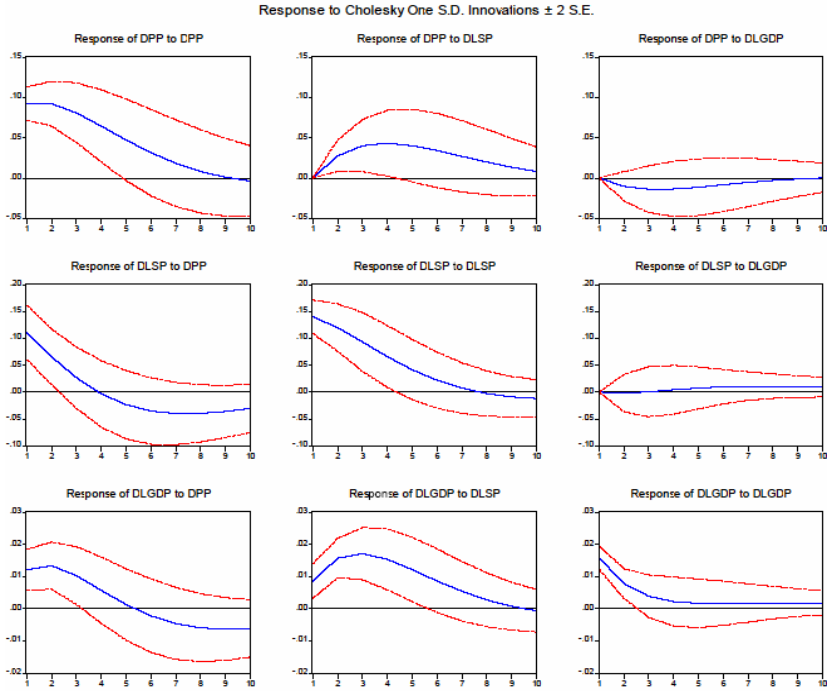
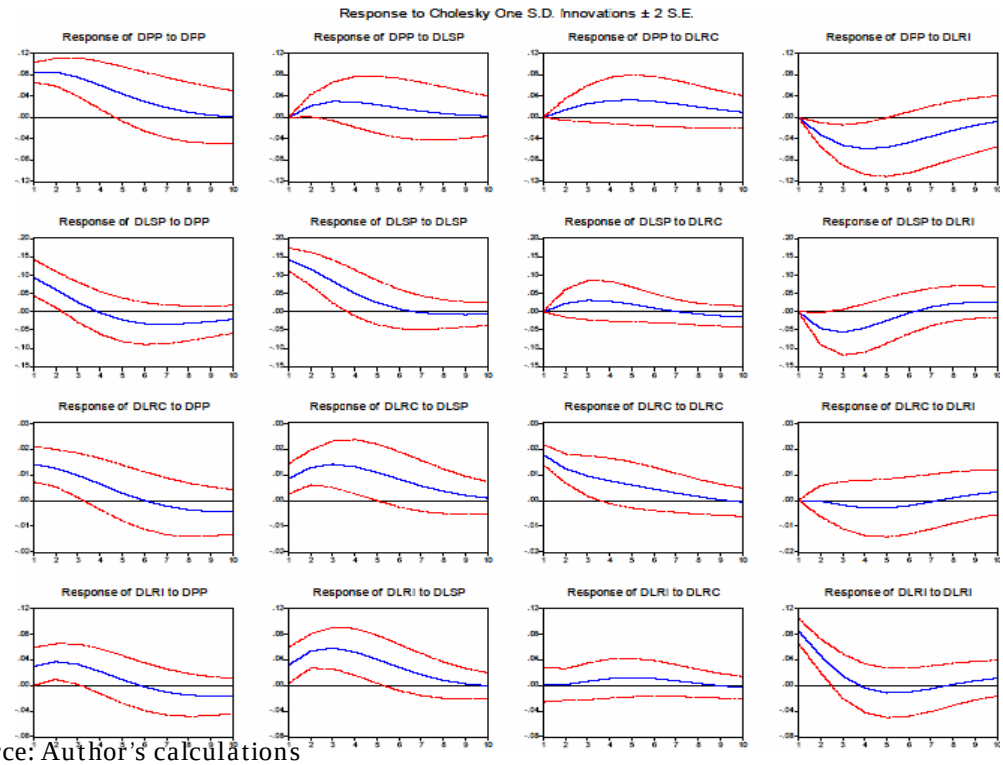


Figure 8　Impulse Response to one S.D. for Hong Kong

4 Variables VAR (real property, equity price, real private consumption

, real investment): 1995Q2—2005Q1



Source: Author's calculations