CHAPTER 5

EMPIRICAL RESULTS

5.1 Stock Market

5.1.1 Cointegration between Thai Stock Index and Dow Jones Index

For the stock market, cointegration method is employed to study the relationship between Thai stock index and Dow Jones index whether Thai stock index depends on Dow Jones index or not.

The cointegration test is shown in Table 5.1 with 12 lags. The hypothesized No. of CE(s) is that none of which is rejected at 5% level of significance since MacKinnon-Haug-Michelis p-value is 0.0183 which is lass than 0.05. Therefore, trace test indicates 1 cointegrating equation at the 5% significance level. In other word, Thai stock index (SI) and Dow Jones index (DJIA) have the long term relationship. The cointegration equation can be shown by the equation as follows:

$$SI_t - 0.128DJIA_t = 0$$

or

$$SI_t = 0.128DJIA_t$$

When Thai stock index and Dow Jones index have long term relationship, although the change in Dow Jones index partially has an impact on Thai stock index, the change in Dow Jones index inevitably leads the change in Thai stock index. Therefore, it is difficult that the Bank of Thailand could prevent Thai stock index from fluctuation caused by Dow Jones index.

Table 5.1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Trace Statistic	Critical Value	Prob.**
None *	18.30882	15.49471	0.0183
At most 1	0.01602	3.841466	0.8991

5.1.2 Effect from the Bubble Bust to Thai Stock Market

The sentiment in the Thai stock market after 1997 was very slow. The stock price had been continuously plunged at the new low of 207.3 points in the first 11 years on September 4th, 1998. The movements of transaction in stock market had been slowed down. The average transaction value declined 6.9%. Moreover, there were 41 companies left in Thai stock market. The restructure of financial institutions also had an impact on the trading volume. In 1999, the stock index closed at 481.92 points, increasing 35.4%. This is because the stock price was so low and this was attracted to investors. In addition, the interest rate was low as well. Yet, the overall economy had not been recovered since banks still needed to solve NPL problem.

After economic crisis in 1997, Thailand stock market applied Circuit Breaker resort, announced in 1999, to slow down the fluctuation of the price in Stock Exchange of Thailand (SET) index - further details shown in Appendix A. Moreover, SET had slowed down the fluctuation of the stock price by increasing margin requirement as mentioned in section 2.1.3.

Therefore, by using the conclusion in section 5.1.1 and 5.1.2, it can be concluded that the fluctuation in stock price can be controlled through regulations in such a limited area as most regulations are to relieve the severity, not to prevent. Moreover, the market is quite sensitive to domestic and international factors; especially the international impact is inevitably. For the recovery duration, it can be noticed that the market began to recover in 1999, relatively faster when comparing with other sectors.

5.2 Property Market

The purpose of this section is to study the effect from the bust of the bubbles on property market which considers the linkage to other economic sectors. The economic recession obviously appeared since 1998 which dramatically affected real estate sector as the market became fully over-supply because many entrepreneurs over invested for speculation rather than considering the demand of the market. The impact of real estate sector was widely observed.

Commercial property market used to reach its height at 650 baht per square meter at the end of 1991. Six years later, the monthly rate for good grade rental office dropped to 567 baht per square meter at mid year of 1997 while the demand had been plunged, including the closure of 56 financial institutions. Many new projects were being on hold. Yet, there were projects completed in 1999 around 270,000 square meter and left the vacancy rate up to 40% while the rental was being decreased and reached 376 baht at the end of 2001.

The convenient store property market also suffered from the crisis. The market condition looked bad and continued to fall because of decreasing purchasing power and low market demand. Therefore, the rental demand in convenient store was low, making the average vacancy rate changed from 18% in July to 21% at the end of 1997. It became more fatal in 1998, reaching 27% rate of vacancy and the rental rate for the convenient store in the center of Bangkok was cut from 2,350 baht at mid 1997 to 1,580 baht at the end of 1997.

The condominium property price sky-rocketed at 52,000 baht per square meter in 1994. When crisis began in 1997, the price was continuously decreasing and approaching 38,500 baht per square meter in 1999. Moreover many projects had been put off or immediately halted and no condominium construction during 1998-2000.

The collapse of real estate also affected many other sectors, including the entire economy. Such sectors are financial institution, industry, and labor market.

Financial institution sector was highly affected since many entrepreneurs faced liquidity problem and, later, most debt became NPL. Some went to debt reconstruction process.

The industrial sector, especially construction material, decreased 38.3% since there was an excess supply in real estate. Some plants stopped production line to reduce inventory cost. Moreover, steel industry also faced the difficulty as the rate of production reduced by 31.5% because of the decline of domestic demand. Some plants had been closed and laid off thousands of employee.

Labor market, as a derived demand of finished products, highly suffered from the closure of businesses in real estate, financial and production sectors. The unemployment rate rose 2.1 times from 1996, or around 1.31 million workers left unemployed.

As mentioned, it is found that when the real estate faced the problem, it will have an impact on many other sectors. Therefore, taking precaution and keeping an eye on the size and duration of the bubbles in this sector by the Bank of Thailand should be highly recommended.

In addition, when comparing severity and duration of the crisis problems, the impact from the plunge of property market is worse and takes longer than what happened in the stock market.

5.3 Relationship between Stock Price and Property Price

The purpose of this section is to study whether or not there is the relationship between stock price and property price. If so, which of these two factors are independent variable and dependent variable by using stock index and housing price index as an indicator of asset prices in both markets.

Table 5.2

Causality between Stock Index and Housing Price Index

Null Hypothesis:	F-Statistic	Probability
HPI does not Granger Cause SET	0.93235	0.53423
SET does not Granger Cause HPI	2.81091	0.02727

The result of Granger causality test, shown in Table 5.2, has two approaches – the first one, null hypothesis, is that the housing price index does not cause the stock index and the second, null hypothesis is that the stock index does not cause the housing price index. From the second approach, it is found that null hypothesis is rejected at 5% level of significance since p-value is 0.02727 which is less than 0.05. It means that stock price causes the housing price index at the 5% significance level with 11 lags (2 years 9 months). The reason for this is because the investor is so sensitive with the economic situation and news, and, therefore, causing the sensitivity in stock price index. Yet property price index is stickier because of its high price and durability, causing time lag in the change of demand and supply.

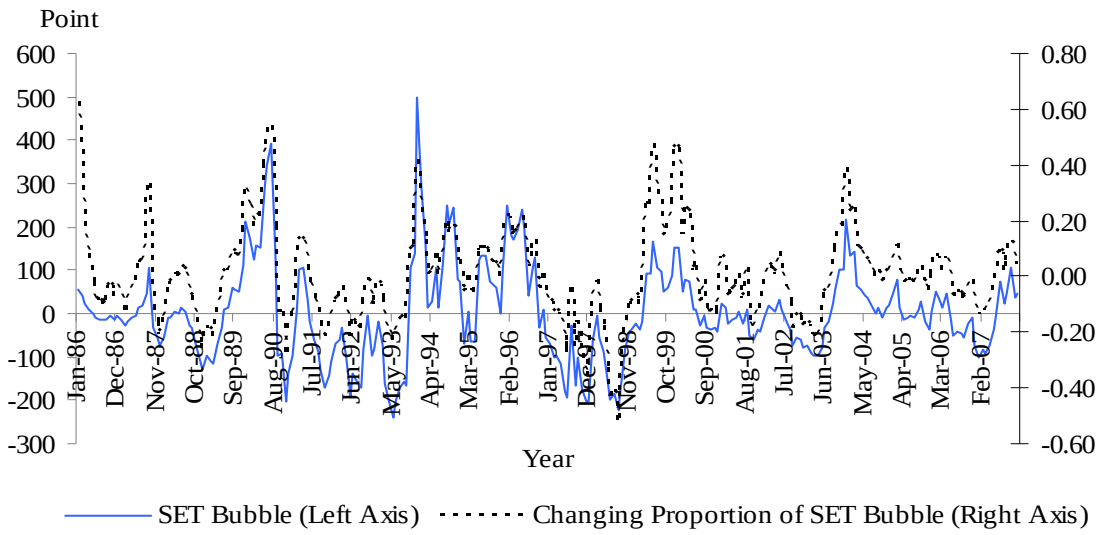
5.4 Threshold of Size and Duration of Bubbles in Stock and Property Market

The purpose of this section is to estimate the threshold of size and duration of bubbles which the Bank of Thailand should take necessary actions. In this study, Hodrick-Prescott (HP) Filter is used to define the size of the bubbles in stock market and property market.

5.4.1 Stock Market

Figure 5.1

SET Bubble



Source: Author's calculation using the data from the Stock Exchange of Thailand.

The bubble size from Hodrick-Prescott (HP) Filter is measured by deviation of SET index from its trend. The result shows the size and duration of the bubble which matches with what happened during the economic crisis. The method is broken down into two parts, stock price (points) and changing proportion which should be in 38 month interval, or 3 years. As shown in Figure 5.1, from the third quarter in 1993 to the end of 1996 during the time before economic crisis took place, it indicates the bubble size has positive value, higher than trend. The highest is about 500 points or

around 0.4. Later, during crisis, bubble dramatically fell below the trend, that is, -220 points or -0.5.

If comparing with other periods when bubble size had high positive value, it is found that this can be broken into 3 parts: June 1989 – August 1990, April 1999-June 2000 and August 2003-September 2004. The first two crises took around fifteen months interval while the latter took fourteen months, but they took less than half of the time taken for economic crisis in 1997, 38 months.

Therefore, the study confirms that not only bubble size but also the duration of bubble is important, and it can consequently be used as the indicator of Thai economy whether the size and duration of bubbles are in the threshold or not. If high positive value fluctuates over 15 months, the Bank of Thailand should keep its eyes on. However, the study cannot confirm which particular month the Bank of Thailand should be more precaution because the result could not exactly pinpoint. Yet, this study suggests that the bust tends to occur when the fluctuation reaches to 0.4 and lasts more than 3 years.

Besides the case of Thailand's economic crisis, the study also extends to the size and duration of bubbles in United State by using Hodrick-Prescott (HP). The U.S. had experienced the bust twice for the past ten years. The first stemmed from the collapse in stock in information technology sector in 2001 and the second was from the decline in real estate in 2008. In Figure 5.2, from March 1999 to February 2001, the size and duration of bubbles reflected the bust. The bubble size became positive, higher than trend, for two years. The highest point reached 1,000 or 0.1, and after that the bubble plunged quickly and continuously, lowering from trend by -1,800 points or -0.2 which related to the collapse of technology sector.

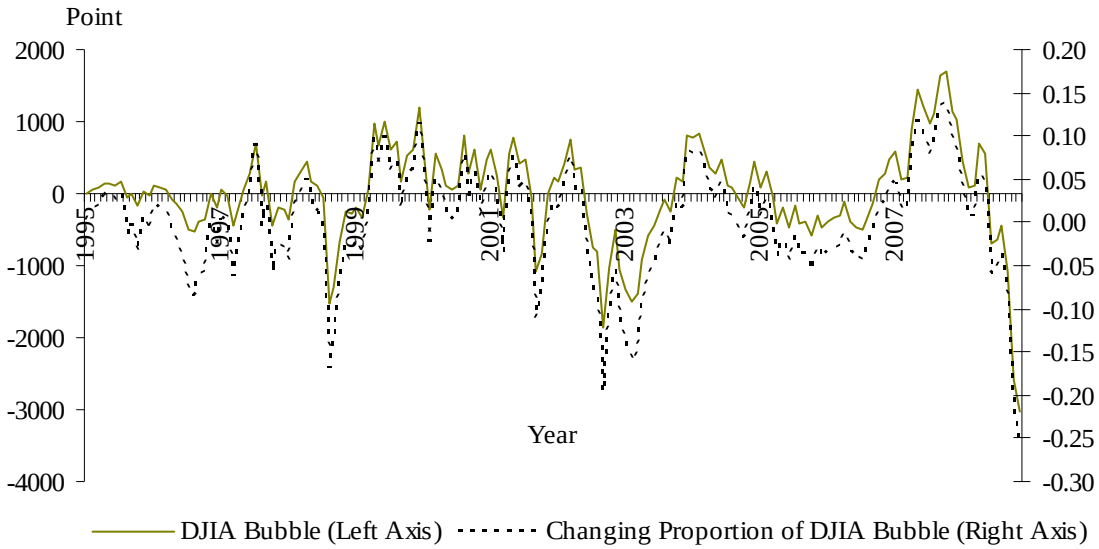
From October 2006 to May 2008, bubble size became positive more than expected trend for about 20 months as the highest reached 1,700 or 0.14. After that, the bubble size declined dramatically, less than trend by -3,000 points or -0.26 in six months. The cause derived from the collision of real estate sector which affected the household consumption which is the prominent factor in the U.S. economy. Once the wealth effect decreased, the expenditure for consumption also declined. This bust may take longer to recover than the last one.

If comparing with other period when the bubble size became positive, there are two parts, in May 1997-September 1997 and October 2003-August 2004 which were shorter than the earlier mentioned busts by half.

As a result, the study on the case of the U.S. matches with Thailand not only in a way of bubble size but also the duration of bubble is highly significant. This study also complies with the study of Ahuja, Mallikamas and Poonpatpibul (2003) claiming the cycle of asset prices usually changes slowly and takes a while whereas the decline of the price happens dramatically and fast.

Figure 5.2

Dow Jones Industrial Average Bubble



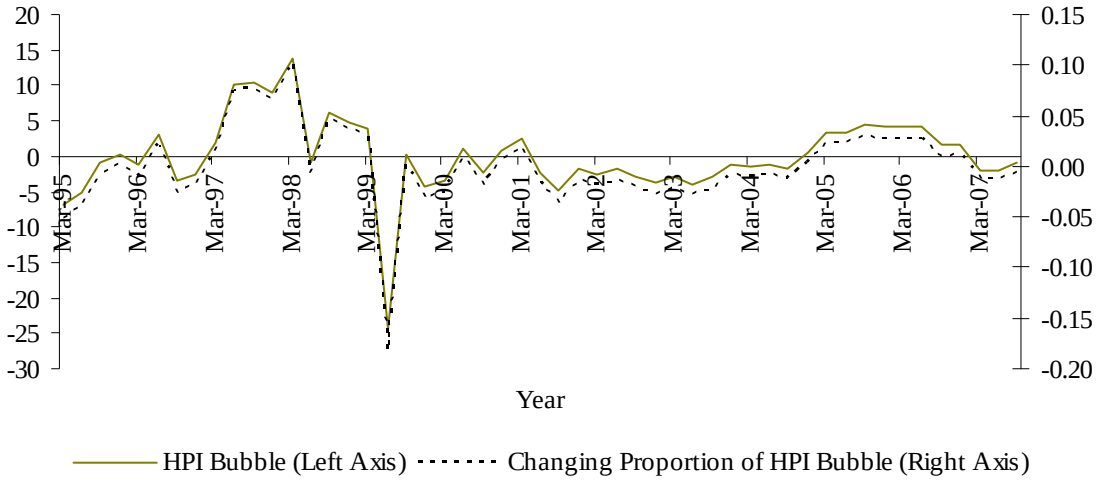
Source: Author's calculation using the data from Dow Jones Indexes website.

5.4.2 Property Market

Despite of studying the bubble in stock market, the equally-interested market is property market. Upon this study, it is intended to study on size and the duration of the bubbles from factor reflected in property price which is housing price index (HPI).

Figure 5.3

Housing Price Index Bubble



Source: Author's calculation using the data from the Bank of Thailand.

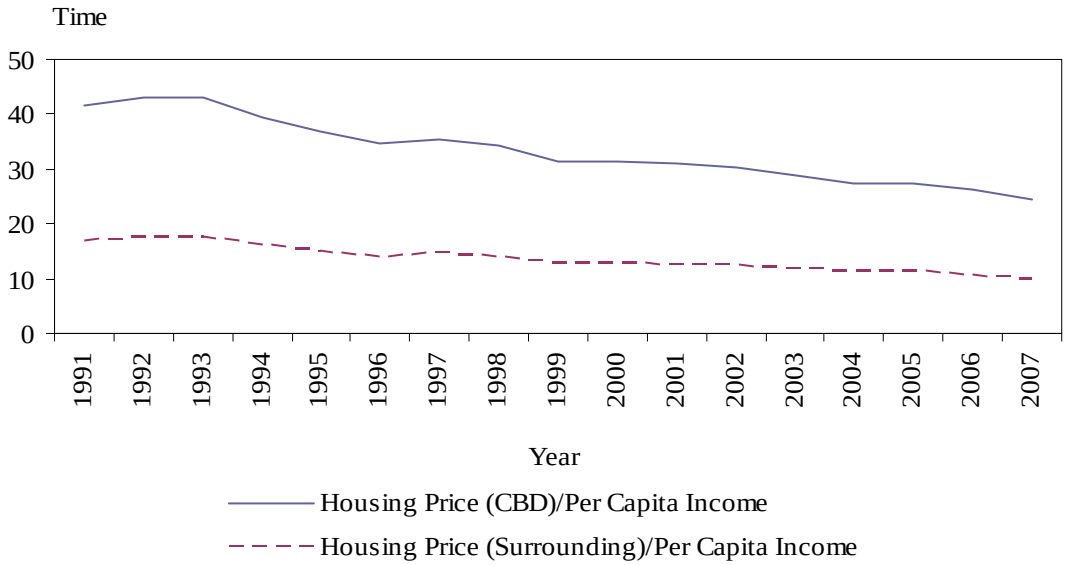
The HPI bubble is measured by deviation of HPI from its trend. The result is shown in Figure 5.3. This can be divided into 3 periods. The first period, pre-crisis, the bubble size had increased perpetually and reached the highest in the first quarter of 1998 at 13.87. The changing of the proportion of HPI bubble is at 0.1. As mentioned, the time lag of demand and supply of property price makes the price of property sticky. Therefore, HPI bubble did not sharply decrease as economy was in the downturn. During crisis, after the first quarter of 1998, the size of HPI bubble dramatically decreased, and went negative, -24.23 or changing of the proportion is at -0.18, as the price started to be reflected by the economic situation. Finally, post-crisis, from the third quarter of 1999, there were bounces between positive and negative area until the third quarter of 2007. In some parts of this period, the bubble had become positive and negative for quite some time as the recovery of Thai economy had been declined by the trend of global economy, especially the recession of the U.S.

The cycle of bubble in property market can be concluded as follows: Firstly, the bubble size had increased perpetually and reached the highest in the first quarter of 1998 at 0.1 which stayed in the positive area for one year and 3 months. However, the size and duration of the bubbles which the Bank of Thailand should look into can

not be identified clearly. Since, there is the limitation of data to compare bubble in different period. Secondly, the property price is sticky to adjust. Finally, the bubble size can be affected by both domestic and international factors.

Figure 5.4

Housing Price to Income Ratio



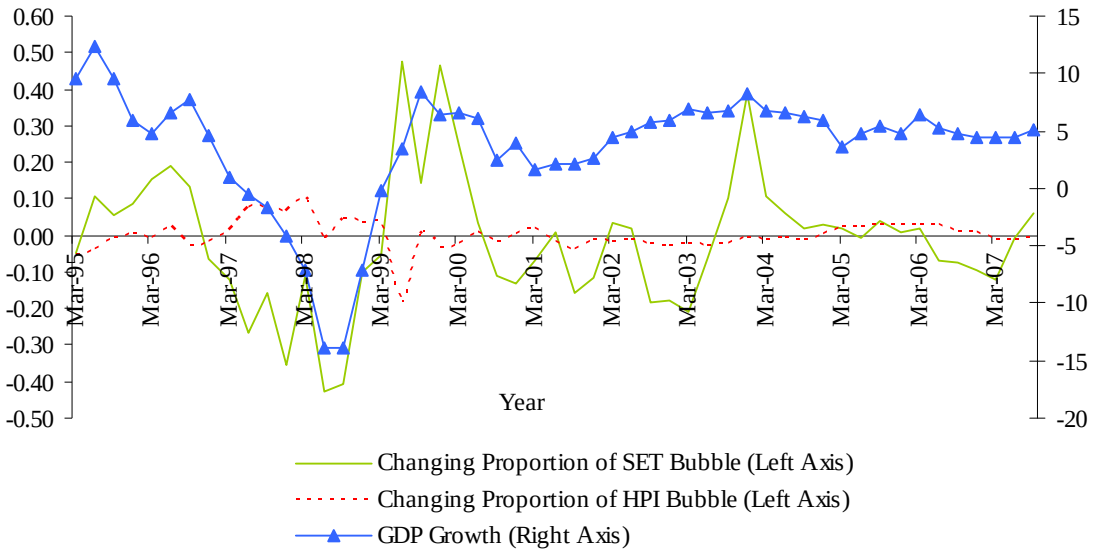
Source: Author's calculation using the data from the Agency for Real Estate Affairs and the Office of the National Economic and Social Development Board.

To make the result clearer, this study aims to find housing price to income per capita ratio by using average condominium price in the size of 30 square meters in central business district (CBD) and the surrounding as shown in Figure 5.4. It is found that housing price to income per capita ratio during 1991-1993 increased continuously from 41.65 folds to 43.17 folds and 16.9 folds to 17.52 folds, respectively. This shows that the growth rate of property price increased at the higher rate than the growth of income which was in line with the growth of bubble in the market. However, the latter proportion had decreased, especially after economic crisis in 1997. The proportion between CBD and the surrounding reduced to 31.37 folds and 12.73 folds in 1998, and finally reached to 24.43 folds and 9.92 folds in 2008, respectively. This demonstrates that income per capita increased at the higher rate. Moreover, in 1990 housing price to income per capita ratio in CBD was higher than the surrounding 25

folds. Yet the difference between 2 areas gradually decreased to 14 folds in 2008. Therefore, it can be concluded that after the crisis in 1997 the housing price did not grow as fast as in 1990s.

Figure 5.5

SET Bubble, HPI Bubble and GDP Growth



Source: Author's calculation using the data from the Stock Exchange of Thailand and the Bank of Thailand.

Table 5.3

Causality between GDP Growth and SET Bubble

Null Hypothesis:	F-Statistic	Probability
SET_BUBBLE does not Granger Cause GDP	0.84014	0.43846
GDP does not Granger Cause SET_BUBBLE	5.89785	0.00538

Table 5.4

Causality between SET Bubble and Property Bubble

Null Hypothesis:	F-Statistic	Probability
HPI_BUBBLE does not Granger Cause SET_BUBBLE	2.00524	0.09403
SET_BUBBLE does not Granger Cause HPI_BUBBLE	5.40857	0.00059

After studying the size and duration of the bubbles in both stock market and property market, this study pursues further to examine the relationship between asset price bubbles (stock bubble and property bubble) and economic growth (GDP growth).

Figure 5.5, Table 5.3 and Table 5.4 show the relationship between GDP growth and the bubbles in stock market and property market. It indicates that the asset price bubbles are related with GDP growth in the different period. The stock bubble is affected by the economic situation (GDP growth) with 2 lags (6 months) while the property bubble is affected by the stock bubble with 6 lags (1 year 6 months). Therefore, when GDP growth changes, it would create the bubble in stock and property market change respectively which is caused by wealth effect. As individuals are relatively richer, it encourages them to speculate in stock market more while more loans are supplied due to higher price of property. In addition, it indicates that the bubbles in both markets have similar trend with the relationship of stock and housing prices, as explained in section 5.3.

5.5 Granger Causality Test between Stock Index (SI), Land Transactions (Land) and Manufacturing Production Index (MPI)

Granger causality test is employed to find the causality between asset prices (stock index and land transactions) and manufacturing production index. The causality between stock index and manufacturing production index with 3 lags (3 months) is indicated in Table 5.5 which has two approaches – the first one; null hypothesis is that the stock index does not cause the manufacturing production index and the second one; null hypothesis is that the manufacturing production index does not cause the

stock index. From the second approach, it is found that null hypothesis is rejected at 5% level of significance since p-value is 0.03024. It means that the manufacturing production index causes the stock price at the 5% significance level. Another approach can be concluded that null hypothesis is not rejected at 5% level of significance since p-value is 0.60134. It indicates that the stock price does not cause the manufacturing production index at the 5% significance level.

Table 5.5

Causality between Manufacturing Production Index and Stock Index

Null Hypothesis:	F-Statistic	Probability
SI does not Granger Cause MPI	0.62281	0.60134
MPI does not Granger Cause SI	3.05865	0.03024

The causality between manufacturing production index and land transactions with 5 lags (5 months) is shown in Table 5.6. The first null hypothesis is that the manufacturing production index does not cause the land transactions. It is found that null hypothesis is rejected at 5% level of significance. It means that the manufacturing production index causes land transaction at the 5% significance level. Another approach can be concluded that null hypothesis is not rejected at 5% level of significance. It indicates that land transaction does not cause the manufacturing production index at the 5% significance level.

Table 5.6

Causality between Manufacturing Production Index and Land Transactions

Null Hypothesis:	F-Statistic	Probability
MPI does not Granger Cause LAND	2.94361	0.01473
LAND does not Granger Cause MPI	1.58027	0.16949

From the result above, it can be concluded that the aggregate demand (manufacturing production index) causes the asset prices (stock index and land

transactions). Therefore, the anticipation of the fluctuation in asset prices can be observed through the fluctuation of aggregate demand. If the Bank of Thailand can control aggregate demand by using monetary policies, it may help cushion uncertainty in the asset prices.

5.6 The Effectiveness of Monetary Policy Transmission Channels

To achieve the last objective which is to examine the effectiveness of monetary policy transmission channels in which the Bank of Thailand can implement its policy instrument to deflate the asset prices or the bubbles. This section consists of two parts, with the first one describing how to construct the model. The second one discusses the methods of interpreting the model, namely the variance decomposition and the impulse response function.

5.6.1 The Model

5.6.1.1 Set of Variables

As mentioned in section 4.4.2, there are five endogenous variables which are log of the repurchase rate (RP), log of the monetary base (MB), log of the stock index (SI), log of the manufacturing production index (MPI) and log of the land transactions (Land). One exogenous variable is log of the Dow Jones Industrial Average Index (DJIA).

5.6.1.2 Lag Length Selection

The appropriate lag length is determined by Akaike Information Criterion (AIC). The longest lag length is set to be 8 lags. The model with the lowest value of AIC is preferred because there is the lowest value of RSS as well. Therefore the appropriate lag length is 5 lags with the AIC value of -11.13177.

Table 5.7

Lag Length Result

Lag	AIC
0	-0.741099
1	-10.56592
2	-10.90803
3	-11.03038
4	-11.04769
5	-11.13177*
6	-11.11286
7	-10.94014
8	-10.98921

Note: * Indicates lag order selected by the criterion

5.6.1.3 Stability Test

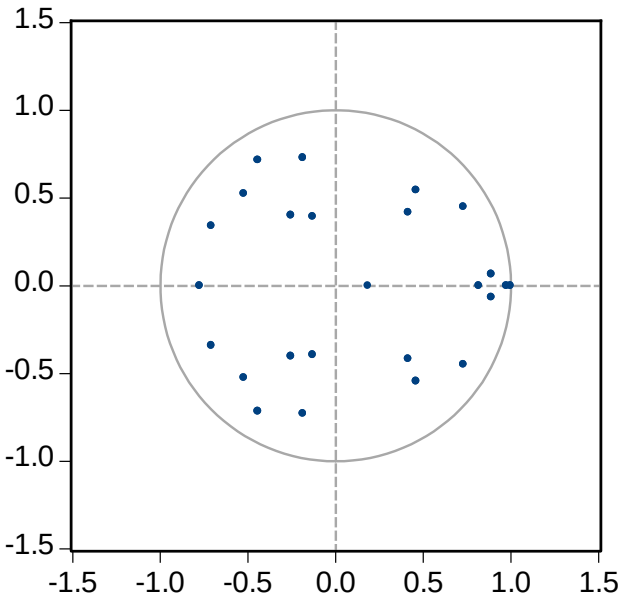
From Figure 5.6, the inverse roots of the characteristic polynomial all have modulus less than one and lie inside the unit circle. This means that the VAR model is stable.

However, some of the variables in the model are likely to be non-stationary. Typically there is a trade-off between estimating the VAR in levels versus in the first differences. The trade-off is between the loss of efficiency (when the VAR is estimated in level) and the loss of information about long-run relationships (when the VAR is estimated in the first differences). In particular, a VAR in first difference provides no information on the relationships between levels of the variables in the VAR, and it is this aspect on which economic theory is usually most informative. Moreover, most of the empirical literatures on VARs have tended to estimate VARs that are unrestricted in levels.[1]

[1] Disyatat and Vongsinsirikul (2002).

Figure 5.6

Inverse Roots of AR Characteristic Polynomial



5.6.2 Interpreting VAR Model

5.6.2.1 Variance Decomposition

The forecast error variance decomposition of asset prices (Thai stock index and land transactions) and economic variable (manufacturing production index) are shown in Appendix E. The variance decomposition of Thai stock index (SI) is illustrated in Appendix E(1). For the one-month-ahead forecast error variance in Thai stock index, almost all variations in Thai stock index are about 98.38% which comes from its own shock. The rest are the monetary base (MB) shock (0.17%) and the repurchase rate (RP) shock (1.45%) whereas the manufacturing production index (MPI) shock and the land transactions (Land) shock do not explain the variations in Thai stock index (SI). After the first month, the monetary base (MB) shock contributes the variations in Thai stock index (SI) up to 2.71% but after that, it decreases to 1.27% in the eleventh month. However, it increases gradually up to 2.22% until the end of the second year. Note that, the repurchase rate (RP) shock has little impact on the variations in the second month but after that the variations increase

dramatically to 36% in the first year, and gradually climb to its peak at 42.55% at the end of second year. Therefore, the variations in Thai stock index (SI) are explained by the repurchase rate (RP) shock more than the monetary base (MB) shock.

For other three variables, in the second month, the manufacturing production index (MPI) shock and the land transactions (Land) shock attribute to the variations in Thai stock index (SI) around 0.06% and 0.03%, respectively. After that, the variations from the manufacturing production index (MPI) shock increase continuously to 11.66% at the end of the second year whereas the variations from the land transactions (Land) shock rise to 4.96% in the eleventh month and decline to 4.53% at the end of the second year. Lastly, the variations from its own shock decrease continuously to 39.03% at the end of the second year.

Appendix E(2) shows the variance decomposition of the manufacturing production index (MPI). The result indicates that, for one-month forecast horizon, almost all variations in the manufacturing production index (MPI) are about 94.95% which comes from its own shock. The rest are the monetary base (MB) shock (0.21%), the repurchase rate (RP) shock (1.87%) and Thai stock index (SI) shock (2.96%) whereas the land transactions (Land) shock does not explain its variations. After the first month, the monetary base (MB) shock contributes to the variations in the manufacturing production index (MPI) up to 4.46% at the end of the first year and 6.02% at the end of the second year. However, the repurchase rate (RP) shock attributes to the variations in the manufacturing production index (MPI) dramatically up to 39.68% at the end of the first year and continuously increases in the second year. Therefore, the variations in the manufacturing production index (MPI) are explained by the repurchase rate (RP) shock more than the monetary base (MB) shock.

Note that, the variations from the Thai stock index (SI) shock rise to the highest at 5.89% in the sixth month and decreases continuously to 2.22% in the long run. As the variations from the land transactions (Land) shock reach its peak at 1.71% in the fifth month and decrease continuously to 0.38% at the end of the second year. Lastly, the variations from its own shock decline continuously to 44.38% at the end of the second year.

The variance decomposition of the land transactions (Land) is shown in Appendix E(3). For the one-month-ahead forecast error variance in the land transactions (Land), almost all variations are about 89.64% which comes from its own shock. The rest are the monetary base (MB) shock (6.87%), the repurchase rate (RP) shock (0.17%), Thai stock index (SI) shock (1.72%) and the manufacturing production index (MPI) shock (1.6%). After the first month, the monetary base (MB) shock and the repurchase rate (RP) shock contribute to the variations in land transactions (Land) up to 10.29% and 9.88% in the eight month, respectively. Therefore, the variations in the land transactions (Land) are explained by the monetary base (MB) shock more than the repurchase rate (RP) shock in the first eight month. After that, the variations from both the monetary base (MB) shock and the repurchase rate (RP) shock increase accordingly but the increase of the variations from the repurchase rate (RP) shock is higher than the monetary base (MB) shock from the ninth month until the end of the second year. So, the variations in the land transactions (Land) are explained by the repurchase rate (RP) shock more than the monetary base (MB) shock. At the end of second year, the variations from the monetary base (MB) shock and the repurchase rate (RP) shock reach to 10.56% and 23.86%, respectively.

For other three variables, after the first month, Thai stock index (SI) shock attributes to the variations in land transactions (Land) around 3.13% in the sixth month. After that, the variations decrease continuously to 2.28% at the end of the second year. However, the variations from the manufacturing production index (MPI) shock rise to 18.58% at the end of the second year. Lastly, the variations from its own shock decrease continuously to 44.71% in the long run.

5.6.2.2 Impulse Response Function

1) Response of the Stock Index to the Innovation of the Monetary Base

Response of Thai stock index (SI) to the innovation of the monetary base (MB) is represented in Figure 5.7. The result indicates that in the first five month, one standard deviation innovation of monetary base (MB) induces the positive effect on the Thai stock index (SI) with the highest value at 1.8% in the second month. Later, it declines to the negative effect for five months and bounces to the positive again in the long run. Therefore, the conclusion is that the shock of monetary base (MB) has a

direct impact on stock index (SI) in the positive direction in the long run, according to the credit channel (balance channel) theory mentioned in chapter 2. Yet, there is a period of 5 months that monetary base (MB) has a negative effect on stock index (SI) due to the fact that the stock market is sensitive to the economic situation than the effect from implementing monetary policy.

2) Response of the Manufacturing Production Index to the Innovation of the Monetary Base

The shock of monetary base (MB) has a positive impact on the manufacturing production index (MPI) for 2 years. However, the impact is strong, about 0.6%, on the tenth month. Therefore, the shock of monetary base (MB) directly affects the aggregate demand in the same direction in the long run, according to the credit channel theory.

3) Response of the Land Transactions to the Innovation of the Monetary Base

The land transactions (Land) react to one standard deviation innovation of the monetary base (MB) from positive to negative in the first five month. After that, it turns to positive value until at the end of the second year, supporting the credit channel theory which claims that the change of monetary base will directly affect the output and land transactions to change in the same direction.

4) Response of the Stock Index to the Innovation of the Repurchase Rate

From Figure 5.8, the shock of repurchase rate (RP) affects Thai stock index (SI) which strongly reverses the direction at the value of 5.6% in the forth months and stays in the negative zone in the long run. This is because, when the interest rate decreases, investors turn their capital to stock market, and, therefore, the stock price increased, as mentioned in equity price channel theory.

5) Response of the Manufacturing Production Index to the Innovation of the Repurchase Rate

The response of the manufacturing production index (MPI) to shock of the repurchase rate (RP) has little negative impact in the first 3 months and stays in the negative zone at the end of second year with the peak at 1.6% in the fourteenth month. Since the interest rate is considered as the cost of investment. Therefore, these two factors have the inverse relationship, as mentioned in interest rate channel theory.

6) Response of the Land Transactions to the Innovation of the Repurchase Rate

One standard deviation of innovation of the repurchase rate (RP) induces the negative effect on the land transactions (Land) after the second month. The highest is at 4.3% in the seventh month. After that, it stays in negative area until the end of the second year, supporting the interest rate channel theory which claims that the change of repurchase rate will directly affect the output and land transactions changing in the opposite direction.

7) Response of the Stock Index, the Land Transactions and the Manufacturing Production Index to the Innovation of the Monetary Base and Repurchase Rate

If comparing the effectiveness of shock of repurchase rate (RP) and the monetary base (MB) on asset prices (SI and Land) and aggregate demand (MPI), the conclusion is in line with the theory shown in Figure 5.9. It indicates that the shocks of the monetary base (MB) and repurchase rate (RP) have impacts on asset prices and aggregate demand in positive and negative direction in the long run. Moreover, if considering the size of effect, it shows that the effect of the repurchase rate (RP) shock is larger than the effect of the monetary base (MB) shock Therefore, regulating monetary policies through interest rate channel and equity channel is more effective than credit channel.

Figure 5.7

Response of Stock Index (SI), Manufacturing Production Index (MPI) and Land Transactions (LAND) to one S.D. Innovations of Monetary Base (MB)

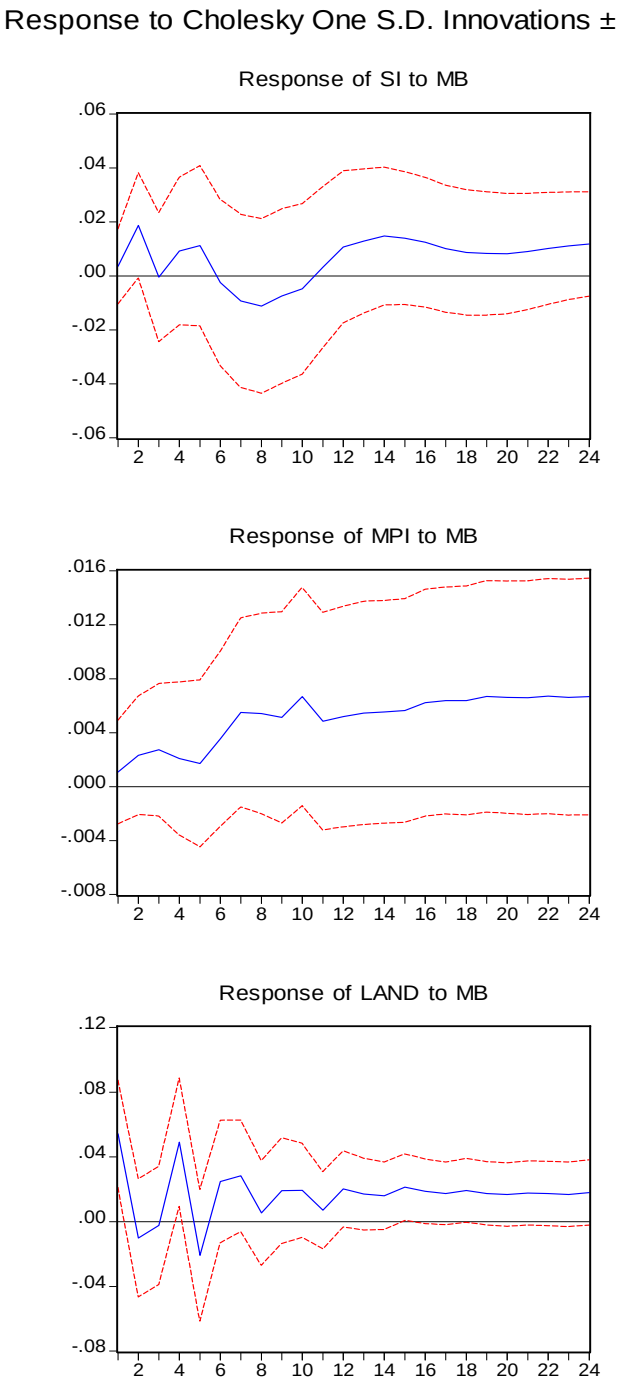


Figure 5.8

Response of Stock Index (SI), Manufacturing Production Index (MPI) and Land Transactions (LAND) to one S.D. Innovations of Repurchase Rate (RP)

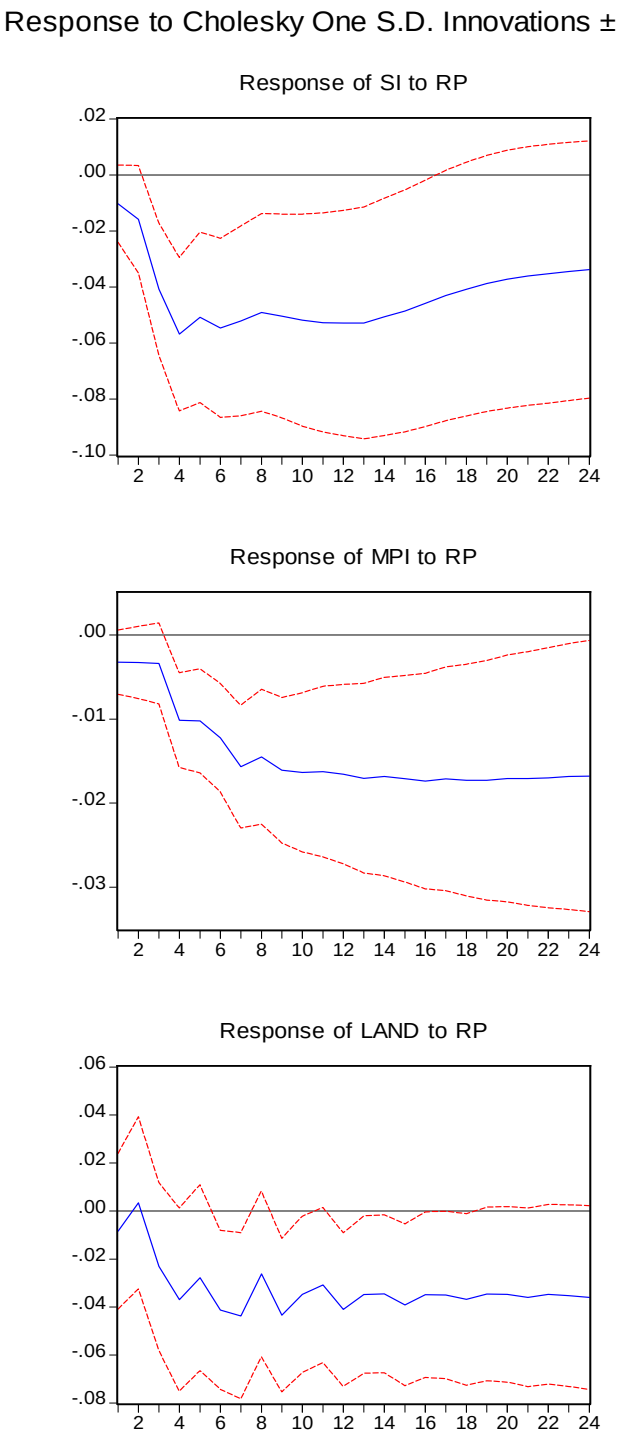


Figure 5.9

Response of Stock Index (SI), Manufacturing Production Index (MPI) and Land Transactions (LAND) to one S.D. Innovations of Monetary Base (MB) and Repurchase Rate (RP)