CHAPTER 2

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Monetary Policy Transmission Mechanisms

In Keynesian view, it typically examines the effect of money on economic activity by constructing models to show how economy operates – using a collection of equations that describes the behavioral interaction between firms and households in many sectors of the economy. These equations show the channels that monetary policy can impact on aggregate demand and supply. Specifically, Keynesian focuses more on interest rate channel and lending channel.

2.1.1.1 Interest Rate Channel

Under the traditional Keynesian view of this mechanism, monetary policy is transmitted through interest rate change as follows:

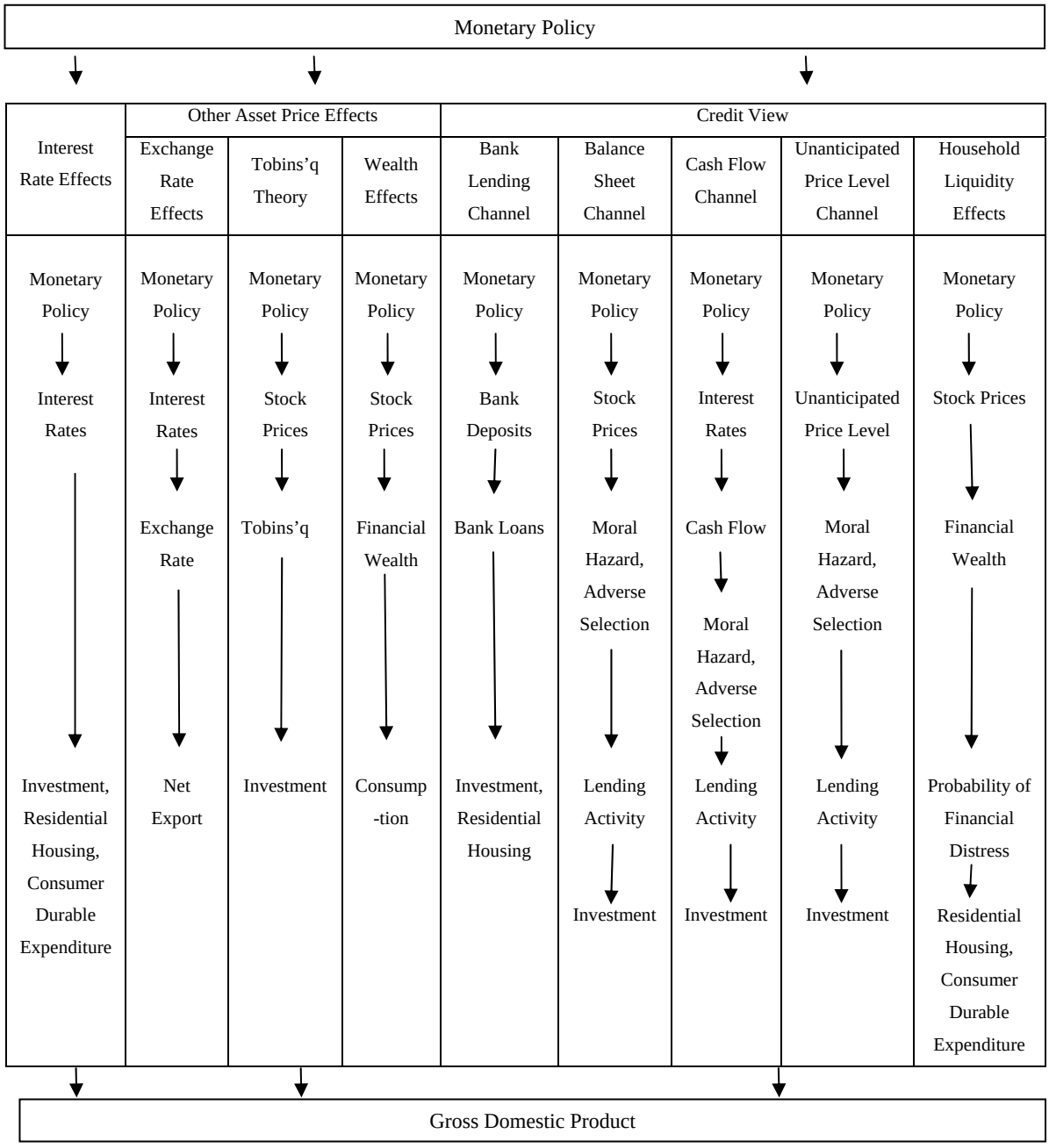
$$M \uparrow \Rightarrow i \downarrow \Rightarrow I \uparrow \Rightarrow Y \uparrow$$

where $M \uparrow$ indicates an expansionary monetary policy leading to a fall in real interest rate ($i \downarrow$), which in turn lowers the cost of capital, causing a rise investment spending ($I \uparrow$), and eventually leading to an increase in aggregate demand and a rise in output ($Y \uparrow$). As this channel operating through business' decision about investment spending, the mechanism presented above is also applicable to explain the consumers' decision about housing and consumer durable expenditure, of which are also considered as investment decisions. The lowering of interest rate, which in turn reduces cost of purchasing, could encourage consumers to increase their durable good expenditure since consumer decision on durable goods such as automobiles and houses are often financed by borrowing. Therefore, the interest rate channel of transmission applies equally to consumer spending on durable good expenditure as well.

An important characteristic of the interest rate transmission mechanism is its emphasis on the real rather than the nominal interest rate as the rate affects consumer and business decisions. In addition, it is often that the long term real interest rate, not the short term that is regarded as having major impact on spending.

Figure 2.1

Monetary Policy Transmission Mechanisms



Source: Mishkin (1998).

2.1.1.2 Equity Price Channel

1) Tobin's q Theory

This theory explains about the effects of asset prices valuation on the investment decision. q is defined as the market value of firms divided by the replacement cost of capital. For example, as monetary policy expands ($M \uparrow$), the stock price rises ($P_e \uparrow$), which increases the market value of firm, causing higher q ($q \uparrow$). It can be summarized as follows:

$$M \uparrow \Rightarrow P_e \uparrow \Rightarrow q \uparrow \Rightarrow I \uparrow \Rightarrow Y \uparrow$$

The market price of firm is high relative to the replacement cost of capital when q is high. In addition, new plant and equipment capital are cheap relative to market value of firm. Therefore, the companies can issue the stock and get high price when it compares to the cost of equipment. Investment will increase because firms can buy a lot of investment goods with only a small issue of stocks.

2) The Wealth Effect

The wealth effect considers the effects of monetary policy on consumers' balance sheets and their expenditure decision. Thus, consumers allocate the budget so that they can smoothen consumption overtime.

An important component of consumers' lifetime resources is the financial wealth whose major component is common stocks.[1] When the stock price rises, the value of financial wealth increases. It increases the lifetime resource of consumers and consumption. In the case of expansionary monetary policy ($M \uparrow$), the interest rate will fall, making investment on equity more attractive relative to bonds. The demand for stock increases and then the stock price rises. Therefore, it induces more spending and higher output level.

$$M \uparrow \Rightarrow P_S \uparrow \Rightarrow W \uparrow \Rightarrow lifetime\,resources \uparrow \Rightarrow C \uparrow \Rightarrow Y \uparrow$$

[1] In the case of Thailand, common stock is less important than the U.S. and European countries because income per capita is low and not many people can assess to the stock market.

2.1.1.3 Credit Channel

This view of transmission is based on the problem of asymmetric information in financial markets. The cost of acquiring information and controlling borrowers' behavior drives a wedge between the cost of internal and external financing. There are two types of monetary transmission channels arising according to information problem in credit markets: those that operate through effect on bank lending and those that operate through effect on firms' and households' balance sheets.

1) Bank Lending Channel

Since banks are designed to solve asymmetric information problem between lenders and borrowers, they play a special role in the financial system. However, how large bank lending channel should be depends on two necessary conditions: the relative importance of banks and the financial institutional structure of economy.

The relative importance of banks in economy depends on the development of financial system. If certain types of borrowers face difficulties in accessing directly to capital market, the role of bank lending channel is more important. This is particularly true for small firms since large firms are able to access capital market through stock and corporate bond issuance a lot easier. The second condition is the financial institutional structure. This condition holds when monetary policy actions are able to have direct effect on the supply of bank loans. The potential for a direct relationship between bank lending and policy actions arises from the fact that central banks impose legal reserve requirements on bank deposits. As long as there is no perfect substitute between bank and other sources of funds, expansionary monetary policy will lead to an increasing bank reserves and bank deposits and thus raising the quantity of bank loans available. The more loan banks give to firms, the more investment spending in the economy. The monetary effect is summarized as follows:

$$M \uparrow \Rightarrow bank\ deposit \uparrow \Rightarrow bank\ loan \uparrow \Rightarrow I \uparrow \Rightarrow Y \uparrow$$

The effect will be reversed if the policy operates in the opposite direction. An important implication of the credit view is that monetary policy will have a greater effect on smaller firms than large firms as reasons given above.

2) Balance Sheet Channel

Changes in monetary policy could alter balance sheet situation of firms and households. Monetary policy can affect firms' and households' balance sheet in several ways through firms' and households' net worth, cash flow, and unanticipated price level changes. For example, expansionary monetary policy ($M \uparrow$), which causes a rise in equity price ($P_e \uparrow$) as reasons given earlier, raises the net worth of firms and so leads to higher investment spending ($I \uparrow$) and aggregate demand ($Y \uparrow$). The schematic representation is as follows:

$$M \uparrow \Rightarrow P_e \uparrow \Rightarrow \textit{net worth} \uparrow \Rightarrow \textit{lending} \uparrow \Rightarrow I \uparrow \Rightarrow Y \uparrow$$

In case of cash flow, an expansionary monetary policy, which lowers nominal interest rate, also causes an improvement in firms' balance sheets because it increases the liquidity of the firms. Therefore, it is easier for lenders to know whether the firm will be able to pay its bills or not, thus encouraging lending and economic activities. It can be summarized as follows:

$$M \uparrow \Rightarrow i \downarrow \Rightarrow \textit{cash flow} \uparrow \Rightarrow \textit{lending} \uparrow \Rightarrow I \uparrow \Rightarrow Y \uparrow$$

The unanticipated price level operates through monetary policy effects on the general price level. Suppose that there is an unanticipated rise in price level, this lowers the value of firms' (or household's) debt in real terms. However, it does not lower the real value of the firms' (or household's) asset because debt payment is contractually fixed in nominal term. Therefore, monetary expansion leads to an unanticipated inflation ($P \uparrow$) and relatively raises real net worth, leading to a rise in investment spending and aggregate output as shown in the following scheme:

$$M \uparrow \Rightarrow \textit{unanticipated } P \uparrow \Rightarrow \textit{relative net worth} \uparrow \Rightarrow \textit{lending} \uparrow \Rightarrow I \uparrow \Rightarrow Y \uparrow$$

2.1.2 Effects of Monetary Policy on Property Prices

Figure 2.2

Housing Market

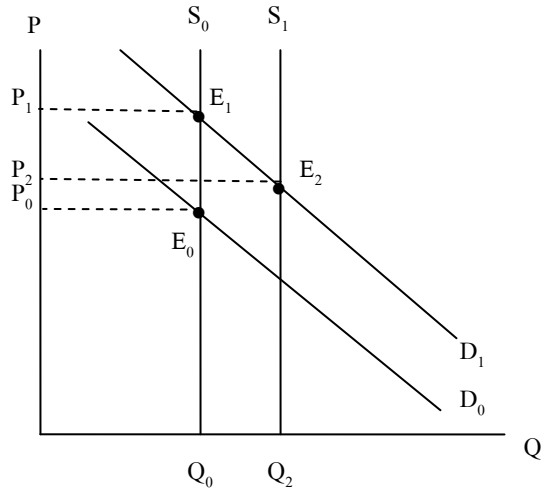


Figure 2.2 demonstrates the equilibrium of housing market. The supply is drawn as a vertical line since the home cannot be constructed within the short period of time. The market price is set at P_0 and the house-sold quantity is Q_0. According to monetary policy transmission channels, when central bank implements expansionary policy, people will have more income. Therefore, they increase the demand of housing market. The demand for property will shift from D_0 to D_1. The increasing affects equilibrium to change from E_0 to E_1, and the price increases from P_0 to P_1 whereas the house-sold quantity remains the same.

In the long run, once the land is fully utilized, meaning no land to build the house in that area. Home builders will find another area to build more houses. Therefore, S_0 will shift to S_1 causing a change in equilibrium from E_1 to E_2. The price also decreases from P_1 to P_2, and also the quantity of sold house increases from Q_0 to Q_2 because the new land is available to build more houses.

In conclusion, once central bank uses any expansionary policy throughout the monetary policy transmission channels, it will eventually affect an increase in property price. A restrictive policy, by contrast, reverses the effect.

2.1.3 Margin Requirement

Using interest channel and credit channel through money market is a tool to slow down bubbles. The central bank also uses this tool through capital market by employing interest policy and margin requirement policy. In fact, rising interest rate helps reducing loan for speculation. As the cost of speculation increases, the transaction in capital market tends to decrease. Therefore, this can slow down the bubbles of share price.

Margin requirement is an effective tool to control loan for shares. For example, given margin requirement is 60%, the bidders have to pay cash 60% of total share value. Another 40% can be borrowed from financial institution. If margin requirement is raised, then the loan demand for buying share will be lessened. Therefore, this is an effective tool to slow down the bubbles as well.

In contrast, setting margin requirement at lower rate will encourage investors to borrow more loans for bidding shares and to use less cash. This will harm investors when capital market is crashing. For example, when the stock index plunged during 1994-1996, the investors faced high loss. In addition, they were forced to maintain margin, to increase more collateral or to pay for the loss margin. Therefore, when central bank poorly manages and ignores to use margin requirement policy, the environment will encourage the bubbles to inflate faster. When the stock bubble busts, it will hurt the economy as a whole.

As a matter of fact, the Stock Exchange of Thailand sets the following regulations regarding margin requirement which include[1];

1. The initial rate of margin means the initial rate of margin under the Notification of the Office Re: Performance of Services Relating to Lending of Money for the Purchase of Securities and Lending of Securities to Non-institutional Customer for the Purpose of Short Sale. The initial margin shall be required at 50 percent.
2. In case the customer's asset is lower than the value of collateral required to set aside, the member must ask the customer in writing to place additional money or property as collateral or act anything so that the customer's asset is not lower than the

[1] Stock Exchange of Thailand (2008).

value of collateral required to set aside. A margin call shall be required at 35 percent for a securities loan and 40 percent for a short sale.

3. A liquidation of a margin account shall be required at 25 percent for a securities loan and 30 percent for a short sale.

2.1.4 Lending Constraints Theory

Based on the neoclassical model, the asset price determination requires a strong assumption on future information. That is future dividends (rents) are assumed to be known as well as the size of the bubbles. Monetary policy in the neoclassical model is represented solely by the level of interest rate, which is relevant as the discount factor.

There are many models exploring about this topic. They explain the effect of the firm's credit condition on its investment. These models explain how investment could be dependent on bank lending. The liquidity constraints of firms occur due to asymmetric information as potential lenders are not convinced by the quality of the projects. Therefore, collateral is important as a way to get around asymmetric problem.

There are two ways to describe the importance of collateral. The first one is asymmetric information approach which suggests that the increase of collateral value of borrowers' asset will enhance credit lines for lending and the net worth of credit-constrained borrowers which will further increase the asset prices of the borrowers. The second approach uses collateral based on enforceability of contract and possibility of renegotiation. Since the borrowers could hold up and/or reduce debt payments in case the business goes wrong. Therefore, lenders want the collateral in the first place.

2.2 Literature Review

In order to support this study, there are many literature reviews which relate to transmission mechanisms, asset prices, and bubbles.

Firstly, the studies focus on factors which regulate loan. Starting with Ganay (2000) and Genay & Halcomb (2004), they use regression to find the coefficient between core deposit (total deposit less time deposit more than 10,000 U.S. dollar) and loan supply in both large banks and small banks. Their studies reveal that core deposit and loan supply are positively correlated. In addition, Ganay (2000) found that the small banks seem to have a bigger impact of the decline on core deposit due to the limited sources of fund accessibility and capital market imperfection. Therefore, they rely more on core deposit than large banks do.

Furthermore, Genay and Halcomb (2004) shows that the bank interest rate is negatively associated with deposit. In addition, Genay and Halcomb (2004) and Hofmann (2001) indicate that the bank interest rate is negatively associated with loan supply as well. But there are different periods and level of significance. Genay and Halcomb (2004) separately investigated the factors into two periods: 1976-1993 and 1976-2003. During 1976-1993, interest rate and loan supply had negative relationship. However, the relationship seems to be insignificant among large banks groups. Contrasting with the second period, during 1976-2003, the relationship between 2 factors was surprisingly positively related. The study reveals that the change may occur sometimes between mid-1990s because of the economic stability, the accessibility of funding, and technological innovation.

In addition, Hofmann (2001) shows the determinants of private sector's credit in industrialized countries and adds more variables into loan supply equation, which are gross domestic product (GDP) growth and property price. By using co-integration variable methodology, he found that the relationship between interest rate is positively associated with GDP growth and property price throughout financial accelerator mechanism. Therefore, all factors have two-way-dynamic relationship. In fact, the study also revealed that not only do the mentioned factors have an impact on loan supply side, but they play important roles on regulating loan demand as well.

There are many studies focusing on factors which affect housing loan as well. Starting with Sirinuntanakun (1999) and Klammek (2002), these studies are about the situation in housing loan market by using least square method. The studies reveal that commercial bank's borrowing from aboard affects to housing loan in the same direction according to the assumption. On the other hand, commercial bank's

borrowing from domestic affects housing loan in the opposite direction which is not consistent with the assumption. Since economic crisis in 1997, commercial bank decreased housing loanable fund.

In addition, Sirinuntanakun (1999) studied about the situation in housing loan market during 1990-1998 and found that GDP affected housing loan in the same direction according to the assumption. Although deposit and the gap of interest rate have the relationship in the same direction with housing loanable fund as hypothesized, it is not significance at 5% level. This study uses different period from the study of Klammek (2002) which uses secondary data during 1997-2001.

Moreover, Klammek (2002) found that the positive factor that affected housing loans extended by commercial bank is interest rate of loan. On the other hand, the negative factor is authorized housing area. In addition, this study analyzes loan criteria of Government Housing Bank. The positive factors affecting the housing loans extended by Government Housing Bank are Government Housing Bank' borrowing from domestic and aboard, while the negative factors are interest rate of loan and authorized housing area.

Another point worthwhile to examine is Brissimis and Vlassopoulos (2007), Chen (2001) and Ito & Iwaisako (1995) who studied about the relationship between asset prices and aggregate credit. In line with one another, these studies reveal the close relationship between the evolution of property prices and aggregate credit. That is the increase of property price can directly drive the demand for credit up, as acquisition of real estate will require loan amount. Moreover, higher property price stimulates economy via wealth effect which encourages investment and consumption spending and, therefore, having an impact on loan. In conclusion, the increase of property valuation will raise the value of borrowers' collateral leading to the increase in borrowing capacity – a mechanism identified in the literature as "financial accelerator"

In addition to previous finding, Brissimis and Vlassopoulos (2007) show that housing prices are positively related to housing loans with low elasticity by using cointegration method. Those disequilibria in the market housing loan do not appear to lead to any adjustments in housing prices in the long run. Therefore the causality does not run from housing loan to housing prices. However, in the short run, the result

indicates that there is an impact from housing prices to housing loans via acceleration and deceleration of the annual growth rate of housing prices.

Chen (2001) and Ito and Iwaisako (1995) also suggest about the relationship between the stock price and property price by using VAR model. As one of financial accessibility, stock market plays a crucial role in investment. Chen (2001) reveals the relationship between stock and real estate prices. When the price of real estate goes up because of bank credit supply, a firm that holds a certain amount of real estate or land has large unrealized capital gains, leading to a stronger balance sheet position. Because real estate serves as collateral for loans, the firm will be able to borrow more for investment. Therefore, either expected profits or future revenue from expanded investment will lead stockholders to bid up the equity value of that firm. This further strengthens the balance sheet position and thus firm's borrowing capacity. On the other hand, Ito and Iwaisako (1995) shows that the stock price also affects the property price. Their finding is that stock returns lead land returns and, by computing bivariate VAR system, they found that exceeding land return could be explained by past (one period lagged) excess stock return and excess land return itself. Firms holding land gain capital on its balance sheet since land price increases for any reasons. The appreciation of firms' value would trigger the positive expectation of firms' future profit. Therefore, it makes them easier either to borrow and invest more or to sell the land. After all, shareholder would receive more return by holding share of these firms, making the price of share increases in the stock markets. In contrast, when stock price increases, firm may use equity to raise funds for investment and, as per unit of further investment, these firms may purchase or lease land in order to carry out fixed investment. Thereafter, the increased demand for land would lead to the rising of land prices. However, these two articles importantly demonstrate that the increasing of fundamental stock and property price cannot be separated from the bubble and the lending channel from bank is more important than interest rate channel in the determination of asset prices.

Moreover, Disyatat and Vongsinsirikul (2002) focuses on monetary policy and the transmission mechanism in Thailand during 1989-2001. The empirical results point to a transmission mechanism in which investment is particularly sensitive to monetary shocks. In part of transmission channel, the exchange rate and asset price

channels are less significant than the interest rate channel. In addition, the role of bank lending declines along with the sensitivity of retail rates to money market rates.

Final point which is worthwhile to mention is about the bubble regulation. Many studies suggest that bubbles cannot be regulated, for example, according to the Economist (2007), it states that even though credit and asset prices boom can make bubbles and finally leads to bust, central bank should not interfere the market. The rational behind is that central bank knows little about bubble than the market itself. Therefore, finding the right policy to encounter the bubble may cause more troubles. Better, it suggests that acting fast after bust would help to mitigate the risk from recession. According to the Economist (2008), it suggests that the fall of asset prices can impaired the economy as a whole through 3 channels which are 1) the fall of mortgage and housing markets which lower residential investment, therefore, recedes GDP; 2) when people move, they need to borrow some extra money for their new home. However because new house loans are restricted, the fallen demand of the new house, therefore, has lowered all other property transactions. Thus, GDP is impacted; 3) the property wealth has close relationship with consumer spending. Once house prices are plunged, consumer spending will decrease as well. And it finally impairs the GDP growth.

According to Mishkin's model, if policy makers leave output fall before cutting interest rate, the impact on GDP reduction is bigger than cutting rates once house prices plunge. However; in reality, it would be more difficult than his model indicates. Therefore, his suggestion for making the right policy is yet to be seen.

Nevertheless, Krugman (2002) provided his opinion, vetoing Greenspan's and Bernanke's point of view.[1] While Bernanke expressed his view aligning with Greenspan and Mishkin that Federal bank should not interfere both share market and asset prices because it does not have enough information to measure how big the bubble is, Krugman claimed that Fedreal bank always has to work under limited information. However, he opposed the idea that the best Federal bank could do is only waiting until bust, and fixing the problems right after then. He believed Federal bank

[1] Henderson (2005).

could do many things to deflate the bubble through monetary policy transmission channels.

His comment is supported by the Economist (2002), which claimed that not only did Greenspan deny solving the inflation problems, he also cheered the bubble when saying about “new economy”. Instead of drawing attention to market’s “irrational exuberance”, Federal board could have done such actions as raising interest rate or increasing margin requirements. Yet, Greenspan did nothing at all by claiming that solving bubble without knowing its size may cause recession, while this article clearly states that “recession may still be better than the alternative of letting financial imbalances worsen.”

This study is extended from above literature in case of Thailand and explains why financial market, stock market and property market are related during 1990-2008. In addition, this thesis finds the threshold where the size and duration of bubbles are considered to be large. Moreover, the study looks through the importance of transmission channels which may affect the bubbles throughout the fluctuation of stock price and property price from 1995 until 2007.