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House Prices and Monetary Policy in South Korea

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House Prices and Monetary Policy in South Korea

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- **The ex-ante responses the central bank made in the past to achieve house price stability may not be as beneficial as ex-post responses. However, this attitude has been challenged after facing enormous economic and social expenses caused by the huge economic setbacks resulting from the global financial crisis in 2008.**
 - In the past, houses were generally regarded as a kind of durable asset from the perspective of monetary policy, and therefore changes in house prices, such as share price fluctuations, were not regarded as a factor requiring a monetary policy response.
 - Hit by the financial crisis resulting from the US sub-prime mortgage crisis in late 2007 and by Lehman Brothers filing for bankruptcy in September 2008, the global economy experienced a 1.6 years slowdown (December 2007 to Jun 2009), the longest the world had seen since the Great Depression in the 1930s.
 - The recent economic recession that occurred in relation to the housing market continued for a longer period and caused larger losses to the national economy on average than economic recessions that had nothing to do with the housing market.

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** This paper condenses the main points of "House Prices and Monetary Policy: Focus on Elasticity of Intratemporal Substitution between Housing and Consumption," a report written by Song, Inho and published in the Oct. 2012 issue of Policy Research Series by the Korea Development Institute (KDI).

- **Now that financial stability has been added as a new goal for the Bank of Korea (BOK), there is a greater need than ever for an analysis to be made concerning the linkages between house prices and monetary policy that takes into account recent economic conditions.**
 - During the eighth revision of the Bank of Korea Act on Sep. 16, 2011, financial stability was declared to be a new goal for the BOK. The act was revised to say, “The Bank of Korea shall pay heed to financial stability as it carries out monetary policy.”
- **Inspired by these factors, this paper uses model simulations to deduce the optimal monetary policy frontier line of central bank, and analyzes the effectiveness of monetary policy that takes house prices into account.**
 - The paper discovers the mutual complementarity of housing and consumption and includes this characteristic in its design of the macroeconomic model.
 - Presuming there is an expectation that house prices will go up inside an economic structure where the average loan-to-value (LTV) ratio is 50%, housing and consumption act as complementary goods, and housing demand and consumption tend to move together.
 - The simulation shows that, assuming that the first priority of the central bank is decreasing inflation volatility and economic volatility, interest rate rules that respond to house prices contribute 6% more to inflation stability and 2% more to economic stabilization than interest rate rules that do not.
 - The central bank needs the ability to determine the fundamental factors affecting house prices, and if economic stability is considered an important task, interest rate rules that respond to house prices will effectively carry out monetary policy goals.
- **Since the central bank needs to monitor house prices for financial stability, it is necessary to reorganize credible market indices and construct statistical models to achieve monetary policy goals.**
 - The most that is being done in South Korea at the present is using financial stability reports and other data that KB Kookmin Bank and Real Estate 114 available to the market to gather information about the housing market.
 - The Federal Reserve Bank of New York regularly purchases data from CoreLogic and uses it to monitor house prices. It periodically releases the results of its comprehensive analysis of the financial market in relation to house prices.
 - It is necessary to reorganize market indices and devise economic models in order to monitor volatility in the housing market and to conduct an empirical analysis of the effectiveness of policies.
- **Economic contraction that is connected with the housing market has brought more attention to the important role that monetary policy should play than ever before.**
 - Analyzing and assessing the intrinsic value of house prices in response to an economic recession that is connected with the housing market is an important job for the central bank to do in their pursuit of new monetary policy goals.
 - It might be necessary to consider expansionary monetary policy that seeks to reduce the volatility in house prices and stabilize consumer sentiment about the recovery in the real economy in current situation.

1. Introduction

The financial crisis caused by subprime mortgages in the US at the end of 2007 and the recent economic recession resulting from the collapse of Lehman Brothers in Sep. 2008 lasted for 1.6 years. According to Reinhart and Rogoff (2009), economic recessions such as the recent one that are connected to the housing market last longer on average than economic recessions that are not connected to the housing market and result in a much greater loss for the national economy. As housing begins to be viewed as one of the major causes of economic volatility, the relationship between the housing market and monetary policy has turned into a significant issue. In the past, housing was treated as a durable asset. Since volatility in house prices was regarded as just another kind of asset price volatility, it did not receive attention as an issue that merited monetary policy action. In other words, the central bank had responded to house price volatility with “benign neglect”¹ in their application of monetary policy. However, this apathetic attitude of central banks is becoming harder to maintain in the face of the recent global financial crisis, economic recession, and the significant economic and social costs that these have brought.

This paper assumed that the monetary policy of central banks utilize Taylor rules, the goal of which is inflation stabilization and economic stabilization. Indeed, the recent sense that monetary policy must include economic stabilization is not unrelated to the unique characteristics of housing.

2. Housing and the Macroeconomy in South Korea

A. Characteristics Unique to Housing in South Korea

First of all, presuming that house prices are expected to increase, housing demand and consumption increase in unison, since housing and consumption function as complementary goods. This assertion can also be verified indirectly through Figure 1. The output gap was calculated using the difference between the real GDP and the trend real GDP, this latter having been generated using the Hodrick-Prescott filter. The increase of real house prices was calculated using the house price index provided by KB Kookmin Bank and then finding the year-on-year rate of change.

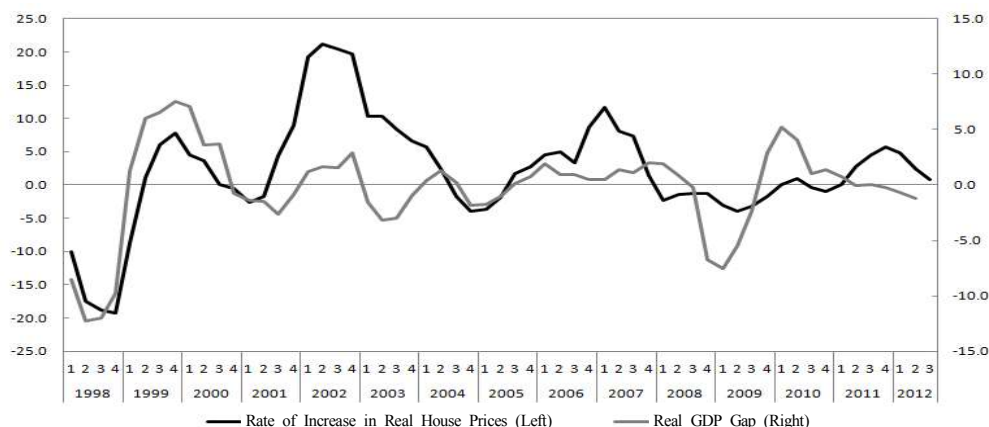
Second, the amount of mortgage loans in South Korea in 2011 was 38.9 billion won. This creates a financial market that is so large in scale that it takes up 31.5%² of the country’s total GDP.

Third, while housing is a durable good that provides the service of housing, it simultaneously

¹ Crowe *et al.* (2011) defined the basic position of central bank’s monetary policy before 2008 as “benign neglect.”

² Source: Bank of Korea

[Figure 1] Rate of Increase in Real House Prices and the Real GDP Gap



Source: Bank of Korea; KB Real Estate Statistics

represents a household's greatest asset. In 2011, housing accounted for 74% of household assets (the average total assets is 297 million won), which is more than three times the proportion of household assets taken up by financial assets. In a structure such as this, house price volatility plays a critical role in changes in the distribution of household assets.

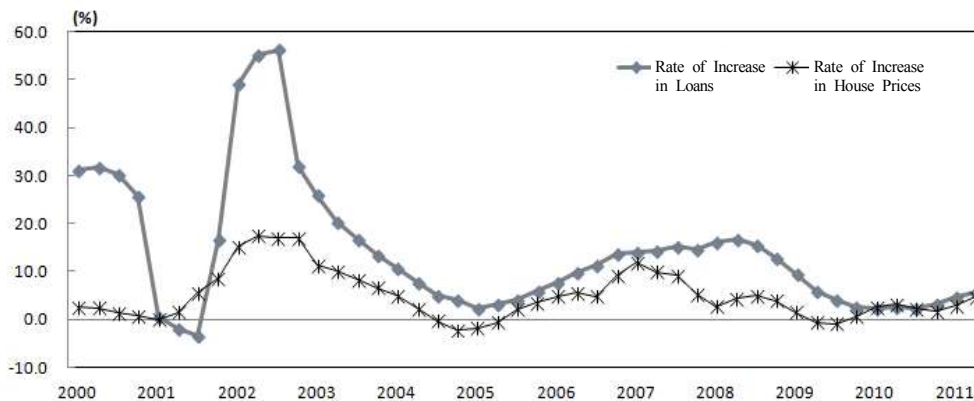
Finally, housing is closely connected with the immovable property of land, and unlike movable durable assets, housing is also tightly linked to housing finance through the very high LTV ratio. That is to say, housing is a long-term immovable asset that determines a household's credit through its use as collateral at financial institutions. The fact that housing can act as collateral creates credit for households and it also has an effect on banks' credit supply (through the change in the collateral available to banks and other financial institutions that results from changes in the collateral value of housing).³ In this case, household mortgage loans are generally connected with house prices at the time the loan was made. Figure 2 shows that, on the whole, the rate of increase in house prices and the rate of increase in mortgage loans move in the same direction. In recent years, it can be seen that the rate of increase in mortgage loans took the lead in the period of 2006–2008 before returning to parallel motion.

B. Correlation Coefficient for the Lag in House Prices, Mortgage Loans, and GDP

Table 1 shows the correlation coefficient for the lag in real house prices, real mortgage loans, and real GDP. The data used here runs from Q1 of 1998 to Q3 of 2012. For the real GDP, national account data from the Bank of Korea was used. For the real house prices and real

³ Generally speaking, financial institutions use the LTV ratio to estimate the scale of a secured loan in relation to the credit supply

[Figure 2] Rate of Increase in Loans and Rate of Increase in House Prices



Note: The rate of increase is year-on-year.

Source: House prices are derived from KB Kookmin Bank's house price index; rate of increase in loans is based on the economic statistics system (household credit) of the Bank of Korea. This data was previously cited in Song, Inho (2012).

〈Table 1〉 Lag Correlation Coefficient Table

Real GDP (level) vs.	-3	-2	-1	0	1	2	3
Real House Price Index	0.73	0.77	0.81	0.86	0.79	0.72	0.65
Real Mortgage Loans	0.68	0.76	0.84	0.91	0.83	0.79	0.67
Call Rate	-0.56	-0.57	-0.56	-0.55	-0.51	-0.47	-0.44

mortgage loans, data from the KB Bank housing sales price index and the BOK mortgage loan data were calculated using CPI, respectively. The correlation coefficient between the real mortgage loans and the real GDP was shown to be high. This indicates that house prices are playing an important role in credit when they influence the GDP through consumption.

3. Analysis of House Prices and Monetary Policy: Frontier Line of Monetary Policy⁴

Having discovered the mutual complementarity of housing and consumption, this paper included it in the design of the Dynamic Stochastic General Equilibrium (DSGE) macroeconomic model. The research also assessed the effectiveness of monetary policy. The necessity of monitoring house

⁴ The monetary policy frontier line means the combination of the set in which economic volatility and inflation volatility are minimized, which is the goal of economic policy. For example, in Figure 3, with monetary policy aimed only at inflation stabilization, the optimal minimum set is made up of 4.12% economic standard deviation and 1.22% inflation standard deviation. This was displayed as the first point.

prices was built into the model, and the assumption was made that the central bank is able to determine the fundamental factors of house prices. The results of the research indirectly suggest the need for the central bank to design a monitoring system for house prices in implementing monetary policy and the need for expansionary monetary policy to respond to house prices in order to achieve the goals of monetary policy during an economic recession that is linked to the house prices.

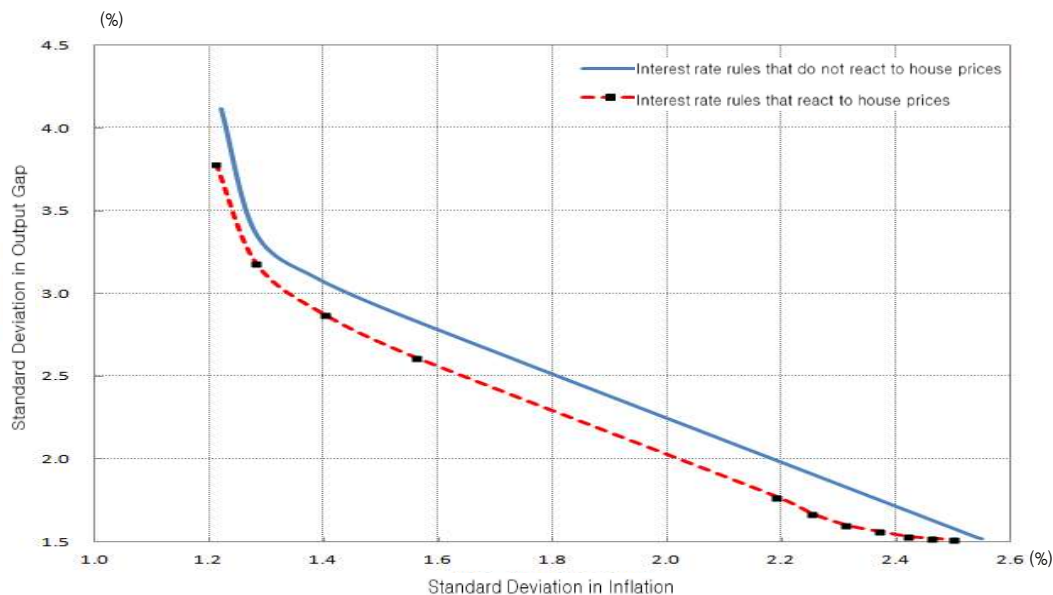
Figure 3 shows the frontier line of monetary policy yielded by the DSGE model simulation. I assumed that the central bank treats economic stability (Y axis) and inflation stability (X axis) as the goals of monetary policy and compared the cases in which interest rate rules take house prices into account (dotted line) and when they do not (solid line). The results indicate that interest rate rules that respond to house prices are more effective at achieving the goals of monetary policy than interest rate rules that ignore house prices. That is, the line for interest rate rules that react to house prices falls below the line for interest rate rules that are unrelated to house prices, which shows the former rules have a stabilizing effect in terms of reducing volatility in the price of goods and in the economy. This shows that, as the central bank gradually begins to emphasize the importance of stabilizing the economy in policies originally intended solely to stabilize inflation, interest rate rules that respond to house prices are more effective at achieving monetary policy goals. In particular, the greatest volatility reduction effect is seen in monetary policy goals that combine a 70% proportion of inflation stabilization and a 30% proportion of economic stabilization.⁵ It was found that, when a reduction in inflation volatility and economic volatility is defined as a task of monetary policy, interest rate rules that react to house prices contribute six percentage points more in inflation stabilization and two percentage points more in economic stabilization than interest rate rules that do not.⁶ In other words, this shows that, the more importance is placed on economic stabilization as a monetary policy goal, the more effectively interest rate rules that react to house prices stabilize inflation and the economy. However, with monetary policy that focuses solely on inflation stability and monetary policy that focuses solely on output stability, it is difficult to find a difference in terms of reduction of both inflation volatility and output volatility.

The scenario suggested by these results is as follows. Assuming an economic structure in which the average LTV is 50%, the occurrence of a shock that leads to an increase in housing demand can be expected to cause house prices to rise. Since housing and consumption act as complementary goods, housing demand and consumption both go up. The opposite scenario, or in

⁵ By analyzing the sensitivity of monetary policy here, it can be seen that the interest rate ultimately responds by about 0.12% to a 1% fluctuation in house prices.

⁶ In the model, the monetary policy goals were set up so that the proportion of economic stabilization and inflation stabilization varied in increments of 10%, forming 11 combinations. This paper deduced the average standard deviation of all the combinations and assessed the monetary policy effectiveness of the two kinds of interest rate rules.

[Figure 3] Monetary Policy Frontier Line



other words falling house prices, leads to a decrease in demand for housing and an accompanying decrease in consumption. On the other hand, if the central bank places importance on economic stability, it should use interest rate rules that respond to house prices with the aim of stabilizing inflation and output.

4. Policy Implications

A. The Establishment of a House Prices Monitoring System by the Central Bank

In the eighth revision of the Bank of Korea Act on Sep. 16, 2011, financial stabilization was added as a new goal of the BOK. According to an analysis by the IMF (2011), a boom in the housing market and the slump that follows it are linked to instability in the financial market, and the expansion of financial instability manifests in different ways according to the importance of the relationship between the financial market system and the housing finance market in each country. One of the primary functions of the housing finance market is the leverage effect achieved through mortgage loans. In regards to mortgage loans, the housing finance market plays a more important role in the overall financial market than ever before. In their analysis of the role of financial accelerators in explaining real business cycles, Bernanke and Gertler (1989) point to the importance of the net worth and leverage based on housing collateral. Furthermore, housing is in a complementary relationship with consumption, and housing prices have an effect on

consumption through the wealth effect and a simultaneous effect on the stability of the economy through fluctuations in net assets and in the value of collateral. Presuming that economic stabilization is designated as an important goal for monetary policy, and also presuming that the central bank has the capacity to determine fundamental trends in house prices, interest rate rules that react to house prices contribute to the stabilization of the economy and inflation. This is linked with the ability of the central bank to detect bubbles in house prices before they burst, and it implies the necessity of monitoring house prices.

At the present, the central bank in South Korea does not monitor house prices separately. The most that it does is use data that is released to the market by KB Bank and Real Estate 114 to prepare financial safety reports when necessary.

However, in the US, the Federal Reserve Bank of New York regularly monitors housing prices using data from CoreLogic. It also prepares comprehensive analyses of the financial market that links with the housing market and mortgage loan trends, which are regularly released on the website.⁷ The central bank in the United Kingdom, the Bank of England, publishes a separate report on the housing market every quarter.⁸

B. How the Economic Recession and Monetary Policy Are Linked to the Housing Market

Song (2012) argued that the volatility of house prices resulting from austere monetary policies tends to be greater when the LTV ratio in a given economic structure is higher. According to the simulation presented in that paper, in the present South Korean economic situation, a one percentage point increase in the interest rate decreases house prices by 2.8%.⁹ In addition, an analysis of the wealth effect solely caused by an increase in the house price, *ceteris paribus*, shows that a one percentage point increase in house prices leads to a 0.03% increase in consumption. In light of this research, if it is presumed that economic contractions in South Korea are linked to the housing market, the role of monetary policy becomes more important than ever.

To sum up the research findings presented here, it is possible to imagine the following scenarios. Facing an excessive decrease in house prices and a recession in the real economy connected with the housing market, the central bank faces the challenge of having to analyze the intrinsic value of house prices. Analyzing the intrinsic value of house prices is more challenging than any other task that the central bank must undertake in pursuit of financial stabilization. In addition, it will also be necessary to consider adopting expansionary monetary policy to prevent a

⁷ The US Federal Reserve Bank of New York regularly analyzes trends in the housing market with a focus on house prices. <http://www.newyorkfed.org/regionalmortgages/index.html>

⁸ The Quarterly Bulletin, published by the Bank of England, includes articles on the housing market. (<http://www.bankofengland.co.uk/publications/Pages/quarterlybulletin/housing.aspx>)

⁹ Song (2012) essayed a DSGE model simulation in which the South Korean LTV was set at 50%.

significant drop in consumer confidence as a result of a decrease in asset value while simultaneously seeking to stabilize consumer sentiment about a recovery in the real economy. The direct correlation between financial stability and economic stability will need to be demonstrated through additional research. However, expansionary monetary policy might be helpful in seeking financial stability and economic stability during the time of economic contractions that are linked to the housing economy. On the other hand, it will be necessary to confirm through subsequent research to what extent mortgage loans act as financial accelerators in the economic structure in South Korea, in which housing and consumption are complements.

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