Money, housing, and inflation in China

Chengsi Zhang

China Financial Policy Research Center, School of Finance, Renmin University of China, Haidian District, 59 Zhong Guan Cun Street, Beijing 100872, China

Received 15 November 2011; received in revised form 15 March 2012; accepted 10 April 2012
Available online 28 April 2012

Abstract

This paper examines the relationship among money, housing, and consumer price inflation in China since 1998. We use a standard multivariate dynamic model and show that when goods prices are sticky, monetary growth is initially transmitted to the real economy via changes in house prices; the changes in house prices are then transmitted to consumer price inflation in China. The results indicate that the recent real estate market boom, mainly driven by excessive monetary growth, dominates the underlying pattern of inflation behavior in China. Relevant policy implications are also discussed.

© 2012 Society for Policy Modeling. Published by Elsevier Inc. All rights reserved.

JEL classification: E31; E52; E58

Keywords: Inflation; Money; Real estate; Monetary policy

1. Introduction

Money and credit growth have been extraordinarily strong in China in recent years. At the same time, China has experienced strong increases in house prices which have significantly outpaced consumer price inflation (CPI). The upswing in house prices was accompanied by an expansion of construction activities. Both developments added to the boost in housing wealth and house price inflation. Although the growth in house prices is more striking than that in consumer prices,
the general pattern of house price inflation appears to coincide with a concurrent change in CPI (as attested to by Fig. 1). This raises the question of possible causal relationships among money, housing, and consumer price inflation in China. In particular, has the recent boom in real estate markets been influenced by increased liquidity, and is there any causal relationship between house price inflation and consumer price inflation?

In principle, multiple interdependencies between monetary growth and house price inflation might exist. For instance, a surge in house prices may trigger a rise in the demand for money due to an increase in net household wealth or due to a higher transaction volume on the housing and construction markets (Friedman, 1988). On the other hand, causality could also run from monetary developments to the housing market if an expansionary monetary policy provides ample liquidity and thereby causes asset price inflation (Adalid & Detken, 2007).

In addition, developments in the housing market may have an important impact on consumer price inflation. According to Meltzer (1995), there is an indirect connection between monetary growth and consumer price inflation with real capital asset prices (e.g. house prices) being the intermediary. This monetarist theory underscores that any rise in house prices may eventually be transmitted to consumer price inflation.

The question about the causality among monetary growth, house price inflation, and consumer price inflation has important monetary policy implications. For example, if excess liquidity flows into property markets, resulting in higher house price inflation and consequent consumer price inflation, a stronger case can be made for the role of monetary analysis in general and the indicator properties of money for consumer price inflation in particular.

To investigate the relative importance of these potential relationships, this study tries to establish an empirical link among monetary growth, house price inflation, and consumer price inflation in China. By explicitly taking liquidity considerations into account, we add to the recent literature which emphasizes the role of housing in economic activity but largely ignores the relation with monetary developments (e.g. Goodhart & Hofmann, 2008). Our work also enriches the empirical branch of the literature which studies the relationship between money and inflation but disregards interdependencies among the three variables of interest (e.g. Ashra, Chattopadhyay, & Chaudhuri, 2004; Belke & Polleit, 2006; Hasan, 1999; Huang, 1995; Qin, Pilipinas, He, & Liu, 2005; Vuslat, 2004).

The remainder of the paper is organized as follows. Section 2 provides stylized facts about monetary growth, house price inflation, and consumer price inflation. Section 3 describes the econometric framework and the empirical results of the underlying analysis. Section 4 discusses the policy implications of the baseline results, followed by Section 5, which concludes the paper.

2. The data and stylized facts

To explore the relationship among monetary growth, house price inflation, and consumer price inflation in China, we use M2 as the measure of aggregate money, the property price index (for building) as the measure of house prices, and the consumer price index as the measure of the aggregate price level. The sources of the raw data are the National Bureau of Statistics (NBS) of China and the People’s Bank of China (PBC), with the sample covering the first quarter of 1998 to the third quarter of 2010 (i.e. 1998Q1–2010Q3). In our empirical analysis, monetary growth is computed as the year-on-year growth rate of M2, house price inflation is measured as the year-on-year growth rate of house price, and consumer price inflation is measured as the year-on-year growth rate of the consumer price index. For brevity, in the following we use the M2GR, HPI, and CPI to denote monetary growth, house price inflation, and consumer price inflation, respectively.
Fig. 1. Monetary growth, house price inflation, and consumer price inflation in China. 

Fig. 1 shows the full sample of observations on the M2GR, HPI, and CPI in China between 1998 and 2010. To provide an intuitive illustration of the dynamic evolution of monetary growth and inflation series, we use in our plot a dual axis scaling with overlapping scales. The figure shows that the general patterns of the evolution of monetary growth and the two inflation series are remarkably similar. In particular, the peaks and troughs of the HPI and the CPI are followed by corresponding rises and drops in monetary growth.

Despite the similarity in the general patterns of evolution, different individual series do not behave in exactly the same way through time. For instance, the level of the HPI is higher than that of the CPI virtually all the time. The HPI is also more volatile than the CPI during the underlying period. In addition, most of the time, monetary growth leads the HPI and the CPI approximately one to two years, while the HPI appears to lead the CPI for a few periods (quarters). This is particularly evident in 2004, 2007, and 2010 when high fluctuations in HPI and CPI are accompanied by large swings in monetary growth in the earlier years.

The stylized facts on leads and lags among monetary growth, HPI, and CPI, perceptible in the graphical representation, indicate that there may be causal links among the underlying variables. The dynamic interactions among money, housing, and inflation, however, need to be rationalized in a formal framework and tested on empirical grounds. The following section embarks on modeling the relation among the three variables and testing for the causal link among them.

### 3. Econometric analysis

#### 3.1. Theoretical framework

The relation among money, housing, and inflation may be rationalized in different channels, namely the money demand channel (Friedman, 1988), the asset price channel (Meltzer, 1995), and the credit channel (Bernanke & Gertler, 2000). However, the money demand channel and the credit channel focus on the relation between money and housing but neglect the relation with consumer price inflation. Meltzer’s (1995) asset price model, on the other hand, provides a useful framework for analyzing the relation among money, housing, and inflation.

This asset price channel suggests that an expansive monetary policy providing the markets with ample liquidity may trigger a rebalancing of assets and thus cause house price rises. The rising house prices may in turn transmit to goods market and eventually leads to increases in consumer price. In essence, Meltzer’s (1995) model suggests an indirect connection between...
monetary growth and consumer price inflation with house prices being the intermediary. Because the housing or real estate market has become an important real capital market that may connect monetary growth and inflation in China since China’s housing market reform in 1998, we adopt Meltzer’s (1995) model to examine possible causal links among the M2GR, the HPI, and the CPI.

The baseline model contains three assets of money, bonds, and real capital (houses). Money is a nominally denominated asset that provides real services as a medium of exchange; bonds are nominally denominated assets that yield the rate of interest, \( r \); and real capital yields a real return—a unit of real capital has a price \( P \). As in Meltzer (1995), the model determines two relative prices to achieve asset market equilibrium for the economy. Fig. 2 shows the position of the asset market equilibrium with the MM and SM lines. MM is an equilibrium relation for the money market and SM is an equilibrium relation for the bonds market. The positions of the MM and SM curves are defined for given asset volumes and for given output and expectations. Changes in these given values alter the positions of MM and SM by changing asset volumes or the determinants of asset demands. The equilibrium values of the interest rate and asset price level are conditional on the existing stocks of assets and the demand to hold them.

The slope of MM indicates the different combinations of interest rate \( (r) \) and asset price level \( (P) \) at which existing money balances are willingly held. The MM curve has a positive slope because when the interest rate rises, wealthy owners tend to reduce their desired money balances and a rise in asset price restores equilibrium by lowering the desired holdings of existing real capital and increasing the desired holdings of money. The slope of SM shows the equilibrium relation for the bonds market. This slope is negative because a higher interest rate increases desired bond holdings and a fall in asset price restores equilibrium by inducing asset owners to shift into real capital. The above equilibrium relations appear to be consistent with the performance of China’s asset market since 1998.

Now suppose there is an expansionary monetary policy that shifts the MM curve to the right to MM1. Wealthy owners now have more money assets and they use the additional money to purchase existing bonds and real capital, thereby reducing the interest rate and raising the asset price level \( P \). In conjunction with the shift of the MM line, the SM line also moves. As shown in Fig. 3, SM shifts to the left (SM1) since the decline in the interest rate and rise in the asset price level reduce the volume of securities being held.

The new equilibrium moves from the intersection of MM and SM at \((r_0, P_0)\) to the intersection of MM1 and SM1 at \((r_1, P_1)\). At the new equilibrium point, the interest rate is lower than it was at the initial level (i.e. \( r_0 > r_1 \)) because both the increase in money and the reduction in securities

Fig. 2. Asset market equilibrium.
lower the interest rate. The direction of change in the asset price may be ambiguous as the two effects on the asset price level have opposite signs. However, Meltzer (1995) shows that if a central bank fixes an interest rate (as commonly behaved by the Central Bank of China), asset prices must rise from $P_1$ to $P_2$, following either an increase in the demand for money or a random rise in the stock of securities.

The movements in asset market equilibrium also disturb the output market which depicts aggregate price changes in terms of aggregate demand (AD) and aggregate supply (AS). Fig. 3 shows how the equilibrium price (at the intersection of AD and AS) shifts in response to the changes in the asset market. The aggregate price level of output is denoted by $p$ and output is denoted by $Y$. When the real capital market booms and asset price $P$ rises, say from $P_1$ to $P_2$, AD will increase and the AD curve will shift from AD1 to AD2. Accordingly, the aggregate price level will rise from $p_1$ to $p_2$.

Overall, Meltzer’s (1995) asset price model suggests that monetary expansion can directly push house prices up, which may eventually lead to consumer price inflation. In practice, the lead effect from house price inflation to consumer price inflation may also be enhanced by differing price stickiness in the housing market and goods market. In particular, the low-cost producers in China may have prevented firms from adjusting consumer price immediately in response to monetary growth while the supply in housing markets was much more restricted and hence house prices rose more quickly. As a result, monetary growth was initially transmitted to house prices, and house price changes then led to consumer price changes at a latter time.

3.2. Empirical results

To examine the relation among monetary growth, house price inflation, and consumer price inflation, we employ a vector autoregressive (VAR) system that is simple but can capture properly the dynamic interactions among the underlying variables of interest. VAR modeling involves estimating a system of equations in which each variable is expressed as a linear combination of lagged values of itself and all other variables in the system. To be specific, the VAR system can be written as

$$X_t = \Phi(L)X_{t-1} + \varepsilon_t,$$  

(1)
Table 1
Results of Granger causality tests.

<table>
<thead>
<tr>
<th>Null hypothesis</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAR: [M2GR, HPI, CPI]</td>
<td></td>
</tr>
<tr>
<td>M2GR does not Granger cause HPI</td>
<td>0.006</td>
</tr>
<tr>
<td>HPI does not Granger cause M2GR</td>
<td>0.045</td>
</tr>
<tr>
<td>M2GR does not Granger cause CPI</td>
<td>0.191</td>
</tr>
<tr>
<td>CPI does not Granger cause M2GR</td>
<td>0.911</td>
</tr>
<tr>
<td>HPI does not Granger cause CPI</td>
<td>0.018</td>
</tr>
<tr>
<td>CPI does not Granger cause HPI</td>
<td>0.025</td>
</tr>
<tr>
<td>VAR: [M2GR, HPI]</td>
<td></td>
</tr>
<tr>
<td>M2GR does not Granger cause HPI</td>
<td>0.014</td>
</tr>
<tr>
<td>HPI does not Granger cause M2GR</td>
<td>0.011</td>
</tr>
<tr>
<td>VAR: [HPI, CPIGR]</td>
<td></td>
</tr>
<tr>
<td>HPI does not Granger cause CPI</td>
<td>0.004</td>
</tr>
<tr>
<td>CPI does not Granger cause HPI</td>
<td>0.061</td>
</tr>
</tbody>
</table>

Notes: Sample spans 1998Q1–2010Q3 prior to lag adjustment; the optimal lag orders are chosen by AIC.

where $X_t$ is a vector time series incorporating the endogenous variables of interest, $\Phi(L)$ denotes the vector polynomial of the lag operator with the optimal lag order determined by information criteria, and $\varepsilon_t$ is a vector shock.

Based on the construction in the foregoing section, we consider three VAR systems. Each VAR model has the form of Eq. (1). The first VAR model contains all three variables (i.e. M2GR, HPI, and CPI), the second VAR model includes the M2GR and HPI, and the third VAR model includes the HPI and CPI. By estimating the first VAR model, we attempt to investigate the general relation and causal links among the three underlying variables. By estimating the second and the third VAR models, on the other hand, we focus on the bilateral causal link between monetary growth and house price inflation, and house price inflation and consumer price inflation, respectively. The second and the third VAR model may also mitigate the concern regarding possible collinearity between the HPI and the CPI when they are simultaneously included in the first VAR model.

To determine the appropriate lag length of the VAR models, the AIC is implemented and the criterion suggests that optimal lags for the three VAR models are 2, 2, and 4, respectively. The VAR models are then used to conduct Granger causality tests. A variable is said to Granger cause a second variable when adding past values of the variable to a dynamic model of a second variable improves the predictability of the second variable. Wald statistics were used to test the null hypothesis of no Granger causality. Wald tests are based on measuring the extent to which the unrestricted estimates fail to satisfy the restrictions of the null hypothesis. A small probability value (i.e. $p$-value) of the Wald statistic rejects the null hypothesis of no feedback to the dependent variable and a large $p$-value implies that the null cannot be rejected. With the corresponding $p$-values, the Granger causality tests provide information about causal links among the underlying variables.

Table 1 tabulates the results of the Granger causality tests for the three VAR models. For the first VAR model (which contains the M2GR, HPI, and CPI), we test for causal links between each pair of the three variables. The first null hypothesis in this VAR model tests for whether monetary growth Granger causes housing price inflation. The corresponding $p$-value (0.006) is smaller than 1%, suggesting that the null hypothesis can be rejected, i.e. monetary growth does Granger cause housing price inflation. Likewise, the $p$-value for the second test (0.045) suggests that the HPI also Granger cause the M2GR at the 5% level of significance. The next two rows report $p$-values (0.191 and 0.911) associated with the Granger causality tests between the M2GR and the CPI in the first VAR model which are insignificant at the conventional levels. This suggests that there
is no significant causal link between monetary growth and consumer price inflation. In addition, the $p$-values (0.018 and 0.025) associated with the Granger causality tests between the HPI and the CPI indicate that the HPI Granger causes the CPI, and the CPI also Granger causes the HPI at the 5% level of significance.

For the second and the third VAR models, which consider bilateral links between the M2GR and the HPI, and the HPI and the CPI separately, the Granger causality test results provide findings consistent with those of the first VAR model, except that CPI does not Granger cause HPI at the 5% level. Taken as a whole, the results presented in Table 1 suggest that there is a bilateral causal link between monetary growth and house price inflation and a unilateral causal link from house price inflation to consumer price inflation, while there is no direct causal link between monetary growth and consumer price inflation.

4. Policy implications

4.1. Monetary conditions and house price movements

The first important finding in our study is that there is a bilateral causal relationship between monetary growth and house price inflation in China. This finding provides important monetary policy implications. First, since monetary growth is significantly affected by swings in the housing market, an assessment of monetary conditions should take developments in the housing sector into account. In the conventional models of analysis (forecast) of monetary growth, real economic output and consumer price inflation are commonly used variables, while house price movements are generally not included in the underlying information set. For example, Zhang (2010) uses lags of real output growth and CPI inflation as leading indicators to assess the dynamic performance of monetary growth in China. The underlying model can be summarized as

$$m_t = f(m_{t-i}, y_{t-i}, \pi_{t-i}), \quad i = 1, 2, \ldots, n$$

where $f(\cdot)$ denotes a linear function, $n$ denotes the optimal lag length, and $m$, $y$, and $\pi$ refer to monetary growth, output growth, and CPI inflation, respectively.

Albeit informative, such a model ignores house price movements as useful predicting information for future monetary conditions. The present study suggests that model (2) should be augmented by adding house price movements (as an endogenous variable), and the negligence of house price inflation in this type of model may lead to inaccurate assessments of monetary conditions. Indeed, the actual monetary growth deviates considerably from the target (estimated) values of monetary growth set by the People’s Bank of China between 1998 and 2010. Table 2 reports the target and actual values of the growth rate of M2 over the underlying period. A close examination of Table 2 reveals that the deviation level of the actual monetary growth from the target values was particularly high in 2002–2003, 2005, and 2008–2010, when the housing market was booming and house price inflation was high. The large deviations between the actual and the target monetary growth in China reflect the importance of considering housing market development in setting and estimating monetary condition targets in China.

Second, house price inflation is significantly affected by monetary growth. This finding indicates that monetary expansion can transmit directly to the housing market in China, resulting in high house price inflation. Therefore, controlling monetary growth remains an important tool in curbing house price inflation in China. To illustrate this point, we use the recent developments in
Table 2

<table>
<thead>
<tr>
<th>Year</th>
<th>Target (%)</th>
<th>Actual (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>16–18</td>
<td>15.3</td>
</tr>
<tr>
<td>1999</td>
<td>14–15</td>
<td>14.7</td>
</tr>
<tr>
<td>2000</td>
<td>14</td>
<td>12.3</td>
</tr>
<tr>
<td>2001</td>
<td>13–14</td>
<td>14.4</td>
</tr>
<tr>
<td>2002</td>
<td>13</td>
<td>16.8</td>
</tr>
<tr>
<td>2003</td>
<td>16</td>
<td>19.6</td>
</tr>
<tr>
<td>2004</td>
<td>17</td>
<td>14.6</td>
</tr>
<tr>
<td>2005</td>
<td>15</td>
<td>17.6</td>
</tr>
<tr>
<td>2006</td>
<td>16</td>
<td>16.9</td>
</tr>
<tr>
<td>2007</td>
<td>16</td>
<td>16.7</td>
</tr>
<tr>
<td>2008</td>
<td>16</td>
<td>17.8</td>
</tr>
<tr>
<td>2009</td>
<td>17</td>
<td>27.7</td>
</tr>
<tr>
<td>2010</td>
<td>17</td>
<td>19.7</td>
</tr>
</tbody>
</table>

Source: The People’s Bank of China.

monetary conditions and the housing market in China since 2008 as an example, to show why and how monetary growth has led to house price movements.

It is widely known that the recent financial crisis triggered by the subprime mortgage bubble in the United States has posed a grave threat to the world economy. When the financial crisis spread to China in early 2008, the Chinese Government implemented aggressive macroeconomic expansion policies with a huge fiscal stimulus package and monetary expansion, to stimulate the real economy. At the end of 2008, the PBC also abolished the credit quota constraints on commercial banks and urged them to expand their lending credits. As a result, the growth rate of money supply and incremental credit has been exploding since 2009, as is evident in Fig. 4.

In the standard monetary policy analysis framework, an accommodative monetary policy, implemented and administered by a central bank, lowers the real cost (interest rate) of investment for the purpose of promoting real economic growth. The accommodative monetary conditions in China between 2008 and 2010, however, have not followed the standard process. In particular, the policy has been implemented and administered by both PBC and State Development and Reform Commission (SDRC). The PBC makes decisions on the overall monetary policy stance and administers aggregate credit supply process under the instruction and supervision of the State

83

Fig. 5. The flow of incremental credit in 2010.


Council. The SDRC, however, determines the distribution and allocation of the credit supply. As an example, Fig. 5 displays percentage distributions of the incremental credit to different industries in 2010. The figure shows that the manufacturing industry was provided with the largest proportion of incremental credit (29%), followed by the real estate sector, retail sector, agriculture sector, and public facility sector. We note that the real estate industry received as high as 17% (average) of the total incremental credit between 2007 and 2010, which have substantively helped the real estate market boom during this period.

4.2. House price movements and consumer price inflation

The second important message in the results of the present paper is that monetary variables in general, and house price movements in particular, need to be given greater weight in the assessment of China’s consumer price inflation than they are given in some current models, which primarily incorporate the monetary transmission mechanism via the effects of real interest rates on real expenditures (e.g. Clarida, Gali, & Gertler, 1999, 2002; Stock & Watson, 2002). In addition, the conventional wisdom highlights that consumer price inflation affects house price movements either through increased general costs or through its impact on rents, with little emphasis on possible converse causal relationship.

These views about the key interrelationships are largely dominated by the experience of the developed economy. In the case of China, however, house price inflation does help in predicting future consumer price inflation while CPI contains no predicting information for house price inflation. This finding implies that changes in house prices in China may influence private consumption through wealth and credit channel effects.

On the one hand, a rise in the house price means an increase in homeowners’ wealth, thus weakening their saving incentives. The significance of this positive wealth effect depends importantly on the fungibility of housing wealth in an economy. Homeowners benefit from a rise in prices, but they can only realize their capital gains by trading down or exiting the owner-occupied sector. To this end, there is a need to find a “matching” household wishing to trade up or a first-time buyer entering the housing market. A well-developed and liquid secondary market should help. Alternatively, homeowners may convert their capital gains into higher current consumption by taking out secondary mortgages or loans on property collateral.
On the other hand, the effect of house price changes on private spending can also be realized through the credit channel, as proposed by Bernanke and Gertler (1995). Because of credit market frictions, cash flows and the conditions of balance sheets are important determinants of agents’ ability to borrow and lend. To the extent that the market value of the housing assets held by households affects their borrowing capacity to finance current spending, house price fluctuations would have an influence on household consumption. Note that there can be significant feedback and magnification effects through the function of the financial intermediaries in the credit channel. In booming periods with rising house prices, as the net worth of households and corporations increases, so do banks’ balance sheets and lending capacity, potentially fostering a credit boom that reinforces the rise in house prices and magnifies the effects on private spending (and investment).

To put the above considerations into China’s context, the house price movements affect private spending and the resulting changes in aggregate demand may have a significant impact on the prices of other goods and services. The variations in house prices may also affect expectations concerning future movements in the price of other goods and services (Zhang & Clovis, 2010). Therefore, it is important for policy-makers to keep a weather eye on house price inflation as a guide to trends in future consumer price inflation. It is also worth noting that the effect of monetary expansion can eventually transmit to CPI via house price inflation, although monetary growth does not directly Granger cause consumer price inflation.

To summarize the second implication of the finding in our analysis, we note that housing sector activity affects the rest of the economy by strengthening the positive effect of rising house prices on consumer price inflation. In effect, easy monetary conditions seem to have contributed to the recent run-up in residential investment and house prices in China, although their effect was probably magnified by the complex administration and implementation system of the monetary policy-making process, as exemplified in the preceding section. As a result, monetary growth in China is now transmitted directly through the price of homes, which eventually causes changes in consumer prices.

4.3. Further implications

Recently, there has been a prevailing argument among Chinese officials that China’s inflation behavior is mainly affected by imported inflation. Recent research by Broda and Weinstein (2004) also propose that import price inflation is a key driver for Chinese consumer price inflation. These arguments apparently disregard the vital role of house price movements in Chinese CPI and may provide misleading policy recommendations. The baseline finding in our work, however, implies that Chinese policy-makers should revise their strategies in combating domestic inflation by shifting the policy focus from import-driven inflation to house price-driven inflation. This policy revision is important because of the dominant (significant) role of house price movements in determining consumer price inflation, as suggested by the empirical results in Section 3.

Import price inflation, of course, may affect domestic inflation in the form of supply shocks. Its impact on CPI, however, is unlikely to be systematic or significant given its nature as shocks. To provide a clearer picture, Fig. 6 plots China’s import price inflation in conjunction with CPI. The raw data of the import price index were obtained from the Global Economic Monitor of the World Bank and its year-on-year growth rate was used as import price inflation (IPI). Fig. 6 shows that the peaks in IPI (in 2004 and 2008) resemble those in the CPI, but the dynamic evolution of IPI is not always in line with that of the CPI, especially in the pre-2004 period. In general, IPI is far more volatile than the CPI, which is nonetheless unsurprising given the definition and construction of the respective variables.
To provide more convincing evidence that policy-makers should shift their focus from import-driven inflation to house price-driven inflation, we utilize a similar model to that in Section 3 by including CPI, HPI, and IPI in a VAR system. The specification and estimation procedures for the VAR model are similar to those in Table 1. The Granger causality test results for the VAR model are shown in Table 3. In terms of the results, we are particularly interested in the causal relationship between the CPI and the HPI and the causal link between the CPI and the IPI. The results in Table 3 suggest that the HPI again significantly Granger cause the CPI (with a p-value of 0.024), while IPI does not Granger cause the CPI (with a p-value of 0.875).

The Granger causality test results in Table 3 reinforce that effective inflation control in China needs to resort to house price control policies. Indeed, recent policy adjustments in the housing market in 2010 reflect a growing concern among policy-makers about the irrational boom of the housing market in China. In particular, the Chinese Government has introduced measures to combat record house prices, including mortgage rate and down-payment ratio requirements for second-house purchases. In some cities, homeowners are prohibited from purchasing a second house or more. Many state-run mortgage lenders have also cut mortgage discounts. Additional taxes on property are also in the pipeline.

Despite such a dramatic tightening package, the underlying controls did not appear to be perfectly effective in soothing house price fluctuations. Whenever there was a sign of the Government relaxing the controls, house prices began to rebound rapidly. In addition, while housing prices in the first-tier cities stopped rising further, they are still at record levels. The ineffectiveness

Table 3

<table>
<thead>
<tr>
<th>Null hypothesis</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPI does not Granger cause HPI</td>
<td>0.043</td>
</tr>
<tr>
<td>HPI does not Granger cause CPI</td>
<td>0.024</td>
</tr>
<tr>
<td>CPI does not Granger cause IPI</td>
<td>0.043</td>
</tr>
<tr>
<td>IPI does not Granger cause CPI</td>
<td>0.875</td>
</tr>
<tr>
<td>HPI does not Granger cause IPI</td>
<td>0.081</td>
</tr>
<tr>
<td>IPI does not Granger cause HPI</td>
<td>0.028</td>
</tr>
</tbody>
</table>

Notes: Sample spans 1998Q1–2010Q3 prior to lag adjustment; the optimal lag orders are chosen by AIC.
of the administrative measures indicates that smooth adjustment of the housing market (and the economy) may rely more on systematic monetary policy adjustments with proper policy tools.

In retrospect, quantity-based tools (e.g. the reserve requirement ratio) have been dominant monetary policy instruments in China. For example and as shown in Fig. 7, the PBC increased the bank reserve requirement ratio 16 times during the period 2007–2008, followed by further adjustments to the reserve requirement ratio in the ensuing period. Interest rate adjustments, however, were less frequent over the same period, as is evident in Fig. 7. It has been shown that quantity-based policy tools are likely to induce higher economic volatility than price-based instrument (Clarida et al., 1999). Therefore, it is of fundamental importance is to press ahead with money policy reforms in China. In particular, the PBC should ease the regulations on interest rates step by step and promote the pricing ability of financial institutions. The central bank should also streamline its operations to make sure that the interest rate plays a key role in conducting monetary policy.

5. Conclusions

This paper examines the causal relationship among monetary growth, house price inflation, and consumer price inflation in China since 1998. Using standard multivariate dynamic model, we show that when goods prices are sticky, monetary growth is initially transmitted to the real economy via changes in house prices; the changes in house prices are then transmitted to consumer price inflation in China. The main conclusion of this analysis contains important policy implications. First, an assessment of monetary conditions should take the development in the housing sector into account. Second, house price movements need to be given more weight in the assessment of China’s consumer price inflation than they are given in the prevailing models of macroeconomic dynamic analysis. Third, policy-makers in China should revise their strategies for managing domestic inflation by shifting the policy focus from import-driven inflation to house price-driven inflation. In relation to these points, the market-based interest rate reform should be continued and implemented in a steady manner.

These suggestions, however, do not constitute a recommendation that house price objectives should have an exclusive role in the conduct of monetary policy. Given the uncertainty surrounding both the shocks hitting the economy and the effects of interest rates on asset price bubbles, house prices should rather be considered as one of the many factors that affect the balance of risks to the economic outlook, albeit an essential one for central banks taking a risk-management approach
to monetary policy. Paying increased attention to house price developments does not require substantial change to the formal mandates of China’s central bank, but rather could be achieved by interpreting existing mandates in a flexible manner, for instance by extending the coverage of current policy targets.

The challenges of an overheated housing market and its causal impact on consumer price inflation require further comprehensive reform of both economic policy and economic structure in China. The premium placed on home ownership in large urban cities makes it difficult to meet the demand from low- and even middle-income households in large cities. Double-track low-cost housing, of course, could be a potential solution. It is unrealistic, however, to expect a sudden change to rebalance the economy, either with the double-track low-cost housing system or with the proposed monetary policy reforms in the short-run. To achieve smooth housing market adjustment and stable consumer price inflation, deeper reforms in all respects of the economy are clearly warranted.

References