Monetary policy and housing bubble
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Abstract. This research paper examines the relationship between monetary policy and housing prices in macroeconomics, with a focus on the United States. Housing prices play a substantial role in the consumer price index, and therefore, ensuring price stability for goods and services. The paper reviews the literature on two different perspectives: John Taylor's argument that loose monetary policy contributed to a surge in house prices, and Ben Bernanke's perspective that other factors caused the housing bubble. This paper contains the discussion on the literature of monetary policy and house prices, using the linear regression model and the idea of Taylor rule from different perspectives to identify the relationship between monetary policy and the housing prices. The analysis reveals differences in purposes of the models, which provides a basis for further discussion on the rule of monetary policy.

Keywords: Monetary policy; housing prices; John Taylor; Ben Bernanke.

1. Introduction

In principle central banks utilize monetary policy as a key instrument to maintain stable pricing for goods and services. The typical inflation target is set at 2% during an economic period, and the main approach to achieve this is by adjusting the short-term interest rate. However, many past studies have investigated the effectiveness of monetary policy over past decades and examined whether or not a rise in housing prices occurred during particular implementation periods.

This paper will focus on two different schools of thought regarding the relationship between monetary policy and housing bubbles, based on research conducted in the United States between 1960 and 2006. The aim is to analyze the results of these studies and provide a personal viewpoint on the subject. To do this, the paper will elaborate on author’s perspective on the subject using a Linear Regression Model from one of the research. By doing so, the paper aims to contribute to the discussion on this issue and shed light on the complexity of the relationship between monetary policy and asset pricing.

The beginning of this paper provides an overview of the literature on two studies. The first study is based on Professor John Taylor's contention that an increase in housing prices was caused by a "too loose for too long" monetary policy. Taylor claims that the Federal Reserve maintained interest rates too low for an extended period of time, which caused a spike in housing demand and a consequent increase in house prices. The second study, based on former Federal Reserve Chair Ben Bernanke's perspective, argues that the monetary policy came up with a lag and that the Fed should not have tightened policy at the time. Bernanke believes that there were additional factors causing the housing bubble, such as the loosening of lending standards, the increase in subprime mortgages, and a general complacency in the financial sector. According to that, the Fed's monetary policy had no bearing on the housing market and the tightening of the rules really had a negative effect. The purpose of this study is to provide a comprehensive overview of the literature on the relationship between monetary policy and house prices by examining the arguments made by both Taylor and Bernanke. The author takes a linear regression model from one of the research to present their own viewpoint on the subject, adding to the existing discussion and providing information that could be useful to both individuals and policymakers.

The paper further discusses the use of models from the two studies that explore the relationship between monetary policy and housing prices. The first model is based on the Taylor Rule, which demonstrates the deviation of the Federal Funds Rate from its predicted value. The effectiveness of monetary policy in achieving the desired inflation rate and its effects on the housing market may both
be examined using this model. The second model is a Linear Regression Model that measures the correlation between monetary policy and housing prices. This model is used to determine whether there is a causal connection between the two as well as to identify any other factors that might be influencing the rise or fall of housing prices. The difference in the simulation of these models provides an argument for the role of monetary policy in housing prices. The way interest rates are chosen by central banks can lead to deviations from the predicted values, and these deviations will be considered as the basis for further discussion.

2. Literature Review

2.1 Monetary Policy and the Housing Bubble

Taylor's principle, first proposed in 1993, suggests that nominal interest rates should move more than 1:1 with inflation. The principle states that if there is a shock that pushes inflation 1% above the target, assuming no consequences for output, the Fed should raise the nominal interest rate by more than 1%. If the Fed raises the nominal rate by less than 1% in this case, the real interest rate will decrease, causing an expansion in the output gap. This results in a higher price level, which can contribute to inflation. The Taylor Rule is a monetary policy tool that satisfies the principle with the minimum requirement of setting interest rates in response to deviations of inflation and the output gap from their targets. According to Taylor (2007), the Fed's monetary policy decisions in the early 2000s consistently set the federal funds rate below the prediction of the Taylor Rule. This, he suggests, was at the heart of the housing bubble, which ultimately led to the financial crisis. Taylor's criticism of the Fed's monetary policy decisions is based on the idea that the low interest rates created an environment in which housing prices were allowed to inflate rapidly, creating a bubble that eventually burst. This resulted in widespread foreclosures and financial instability. By following the Taylor Rule, the Fed could have avoided this outcome and prevented the housing bubble from forming in the first place. Overall, Taylor's principle and the Taylor Rule represent important contributions to the ongoing debate surrounding monetary policy and its impact on the economy.

2.2 Housing starts

The way John Taylor links monetary policy to housing, is focusing on housing starts, an indicator used to determine the number of new residential construction projects that have begun over a certain period. The reason for looking at how it starts is because there a leading indicator of what is going to happen to the housing market. It takes a considerable amount of time to complete a building project, from laying the foundation to selling the finished product in the market, so if there are many starts, it suggests that the housing market will probably be booming in the future, maybe within a year or so. Furthermore, the construction industry is highly sensitive to interest rates since building companies typically rely on credit to complete their projects, with the completion of the project being contingent on the cost of credit. Thus, it is important to link housing starts with interest rates. Taylor conducted a study on the sensitivity of housing starts to interest rates. The regression of housing starts on the federal funds rate (FFR) on the nominal interest yields a significant negative coefficient of 8.3. This implies that when the interest rate is high, housing starts are low, and vice versa. In other words, monetary policy has a significant impact on house prices.

2.3 Fitted Values and Counterfactual

John Taylor developed a model to determine the sensitivity of housing starts to changes in the interest rate. He made two assumptions for the simulation: (1) the actual path of the federal funds rate and (2) the federal funds rate following a Taylor rule. The model predicted that as interest rates increased, housing starts would decrease. The prediction fitted well until mid-2004, when interest rates were increasing and housing starts continued to rise more than a year before falling even more dramatically than predicted.
The counterfactual line, which is the hypothetical situation where monetary policy had been tighter and interest rates had been higher, suggests that the number of housing starts would have been significantly lower than half a million. This would have been in a sense that the housing bubble existed. In essence it is the combination of Taylor’s argument saying that the monetary policy was too loose, compared to the historical perspective the monetary policy that prevailed in the past and this policy had consequences that expanded the house pricing.

Figure 1. Counterfactual scenario compare with historical data, 2000-2006.

Graph from Housing and Monetary Policy, by Taylor, J. B., 2007, NATIONAL BUREAU OF ECONOMICS

John Taylor also examined the relationship between interest rates and housing starts across other countries in the Organisation for Economic Co-operation and Development (OECD) in addition to the United States. He used a chart to show the correlation between housing investment on the vertical axis and the deviation between interest rates and the prediction of the Taylor rule in various OECD countries. The chart revealed a significant positive relationship, indicating that the more a country’s monetary policy deviated from the predictions of the Taylor rule, the stronger the boom in housing investments in that country. This evidence supports the idea that expansionary monetary policy and a rise in housing prices are positively related, not just in the US, but in a wider context. Therefore, the findings suggest that the impact of monetary policy on the housing market is not unique to the US but is a more general phenomenon.

2.4 Reason for the federal funds rate being low

Bernanke mentions two reasons for the Federal Reserve’s decision to implement an expansionary monetary policy during the recession. 1. Unemployment remained elevated even after the end of the recession. Therefore, the Federal Reserve sought to provide sufficient monetary policy stimulus to assure that unemployment would turn round and start to calm down. 2. The fear of a deflationary situation similar to what to an experience so-called deflation scare in Japan. The Federal Reserve was concerned that the United States might enter a liquidity trap, in which the demand for money is so high that monetary policy becomes ineffective in stimulating the economy. In order to avoid this situation, the Federal Reserve wanted to act proactively by implementing expansionary monetary policies.

The most considerable problem regarding to the use of the standard Taylor rule as a policy benchmark is that it implies that monetary policy should be based on current observations of inflation and output. However, because monetary policy operates with a lag, it is important to take into account forecasted values of the goal variables instead of relying solely on current values. Bernanke, therefore, preferred to use inflation forecasts rather than actual inflation in the policy rule. This approach takes into account the effects of monetary policy on future inflation, allowing the central bank to adjust
2.5 Other factors of housing bubble

The commencement of the housing prices increase predates the time of highly accommodative monetary policy. Thus, the timing of the housing bubble does not rule out some contribution from monetary policy.

From the investigation of economists that based on the historical relationships, only a small portion of the increase in house prices earlier this decade can be attribute to the stance of the U.S. monetary policy. The results eventually show that when historical relationships are taken into account, it is difficult to ascribe the house price bubble either to monetary policy or to the broader macroeconomic environment. Bernanke proposed that the alternative mortgage products proved to be quite important and mostly recognized as a likely key factor of the housing bubble.

In the paper of Bernanke (2010), a figure is drawn from a study of 20 industries countries by the International Monetary Fund. The horizontal axis of the figure, shows the degree of monetary policy ease or tightness in each country, measured by the average deviation of policy in each country from the prescriptions of the Taylor Rule. Compared to a study between the change in current account and the house prices. And the fact Bernanke stated that the more accommodating monetary policy would be, the fewer capital flows in general, which appears to be contradictory with the presence of a strong relationship between monetary and the housing bubble.

Figure 2. Monetary Policy and House Prices in the advanced economies, 2002-2006, Graph from Monetary Policy and the housing Bubble, by Bernanke, B, 2010, Board of the Governance of the Federal Reserve System
3. Data and Method

3.1 Taylor rule

The Taylor principle was a key contribution by John Taylor, which states that central banks should adjust nominal interest rates in response to changes in inflation such that the real interest rate also changes. In 1993, Taylor developed the Taylor Rule as a quantitative expression of the Taylor principle, which sets out the minimum requirement for central banks to set interest rates in response to deviations of inflation and the output gap from their targets. The rule is based on the premise that inflation and output gaps are the two most important indicators of the economy's health and should be targeted by central banks. By using the Taylor Rule, central banks can avoid being too loose or too tight with monetary policy, thereby promoting economic stability and growth.

The formulation in specification is expressed as:

$$i_t = r + \pi_t + 0.5(\pi_t - \pi^*) + 0.5\bar{Y}_t$$

Taylor assumed the equilibrium real interest rate $r = 2\%$, real GDP trend $= 2.2\%$, and $\pi^*$ is the inflation target. And it put on the weight of output in 1999:

$$i_t = r + \pi^* + 1.5(\pi_t - \pi^*) + 0.5\bar{Y}_t$$

4. Results

4.1 Taylor Rule estimation

The Federal Reserve's decision to keep interest rates low during the early 2000s is a topic of concern. According to the Taylor rule, the interest rate should have increased in 2002, but instead, the Fed cut the interest rate even further to 1% in 2004 and kept it there until mid-2004. This decision was made despite the fact that the Taylor rule suggested that interest rates were already "too low." Taylor coined the phrase "too low for too long" to describe this period of monetary policy. "Too low" refers to the fact that the interest rate was well below the minimum level predicted by the Taylor rule. And "too long" is the fact that this period of low interest rates lasted considerably longer than what was projected by contemporary standards.
It is slightly different when using the different prediction measures in Headline Consumer Price Index (CPI), since it becomes apparent that the Federal Reserve was cutting interest rates more aggressively than what the Taylor Rule would suggest. In early 2002, the Fed lowered interest rates by 2%, despite the fact that the Taylor Rule predicts that interest rates should have only reached 2% by mid-2003. However, the Fed was still slow to raise interest rates to eventually make up for the gap, as it did not start raising rates until later on.

4.2 Linear Regression Model Estimation

When we consider only the straight impact from the relationship between the natural logarithm of the dependent variable U.S. house prices and the independent variable monetary policy using the linear regression model. Using the data from 1975 to 2022. The result reveals a strong positive correlation of 0.9, indicating a close association between the two variables. The coefficient of 1.32 indicates that for every one percent increase in the monetary stock, there is an average increase of 1.32 percent in housing prices.
Table 1. Summary of estimation results of the Linear Regression Model

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<td>Observations</td>
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<table>
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<tr>
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<th>Standard Error</th>
<th>t Stat</th>
<th>P-value</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
<th>Lower 95.0%</th>
<th>Upper 95.0%</th>
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</table>

Source: Federal Reserve Board

However, this relationship between monetary policy and house prices is not straightforward, as suggested by Bernanke in his paper. Figure 2 illustrates the relationship between monetary policy and house prices across several countries, but it is important to note that the Taylor Rule used in the analysis relies on current values of inflation and output rather than forecasts. This means that the relatively accommodative monetary policy shown for the United States in the graph may be influenced by the use of current values in the prediction model. The graph also shows a weak correlation of only 5 percent variability between monetary policy and house prices across countries. Whereas, Figure 3 shows a strong association between current account and house prices, indicating that capital inflows worsen house prices. This negative relationship is observed across several countries, with approximately 31 percent of the variation in the rate of rising house prices explained by the current account. This suggests that the link between house prices and the current account is stronger than the link between house prices and monetary policy. Therefore, it cannot be simply concluded that monetary policy alone is responsible for changes in house prices.

5. Conclusion

Based on the theories from the paper of John Taylor and Ben Bernanke, this paper investigated whether or not monetary policy led to a housing bubble. In summary, according to Taylor’s idea, monetary policy was overly expansionary and that it artificially inflated the housing market beyond what the fundamentals indicated at the time. This implies that the monetary policy was not consistent with the requirements of the economy and led to negative consequences. In response to Taylor's idea, Bernanke argued that the monetary policy needed to be accommodative enough to prevent a consistent increase in the unemployment rate, even after the recession cycle. Bernanke's argument suggests that the monetary policy was not the primary factor that led to the housing bubble. There is evidence to support the idea that the monetary policy across different countries plays an insignificant role in influencing house prices. This suggests that there are other factors that play a more significant role in determining the rise or fall of house prices. For example, alternative mortgages and the interaction of financial innovation are some of the factors that contributed to the failure of regulation in the housing market. Therefore, while monetary policy may have played a role, it was not the only factor responsible for the housing bubble. In person, the Taylor rule and interest rate expectations are certainly important considerations for the Federal Reserve, but they should not be the only or decisive benchmarks. The prices of housing are influenced by numerous other factors besides interest rates. Therefore, it is important to take a holistic view when analysing the relationship between house prices and monetary policy. Other factors such as financial regulation, economic growth, and market
conditions should also be taken into account. Overall, it is important to avoid oversimplifying the relationship between monetary policy and house prices and to consider the broader economic context.

References:


