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Analysis of the Relationship between Expansionary Monetary Policy and the Housing Bubble in the United States based on the Taylor Rule

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Abstract: The "subprime crisis" refers to a situation that occurred in the United States in which investment funds were compelled to close due to the bankruptcy of subprime mortgage institutions, causing stock market volatility brought on by the financial storm. This situation occurred between 2006 and 2009 and is referred to as the bubble economic crisis. It caused a liquidity crisis in the major financial markets around the world. In the spring of 2006, the "subprime mortgage crisis" in the US started to manifest. The Taylor rule argues that expansionary monetary policy is the cause. The housing bubble in the United States and expansionary monetary policy are the subjects of this essay. As a result of the analysis of related phenomena, this paper concludes that the subprime crisis is caused by expansionary monetary policy.

Keywords: expansionary monetary policy, bubble economic crisis, Taylor rule, inflation

1. Introduction

The subprime mortgage crisis in 2008 was the closest economic crisis to China. Since August 2007, it has swept the major financial markets around the world, including those in the US, the EU, and Japan. The subprime crisis has gained international attention. It not only directly contributed to the 30 million unemployed and 50 million people living in poverty, but it also had an impact on Europe and the Middle East, sparking the European debt crisis and the Arab uprisings. When the dot-com bubble burst in 2001, the stock market plummeted, and the US economy entered a slump, the government attempted to spur growth by stimulating housing and promoting "homeownership" programs. The federal funds rate was lowered by the Fed 13 times in a row, from 6.5% in early 2001 to 1% in June 2003. The housing market was booming as never before, with the average selling price of a single-family home rising more than 50 percent in 2005, and by 2007, house prices were rising faster than they had for more than 30 years. According to the congressional research service in 2021, the share of real estate in the U.S. GDP also increased from 15.9 percent in 2001 to 19.7 percent in 2006. The majority of Americans take out a mortgage to buy a home, and about 70% of all household debt is made up of mortgage debt. In September 2006, housing prices began to fall, exposing financial institutions to risks that were amplified by the high leverage of derivatives and the interactions between financial institutions [1]. The crisis intensified with the failure of investment banks Bear

Stearns and Lehman Brothers, and by September 2008, the financial system was on the verge of collapse and the crisis had become global with enormous consequences.

The collapse of the housing bubble triggered the crisis, so understanding its causes is crucial to avoiding another mistake. This paper is going to find reasons for causing the housing bubble.

2. Theoretical Background and Literature review

The value orientation and theoretical background of government intervention in the United States vary widely among different political parties, and the consistency of economic policies and the stability of the macro environment lack mechanism guarantee. Take monetary policy, for example. The Fed before Mr. Greenspan followed the Taylor Rule, developed by John Taylor, a former Treasury economist. That is, the deviation between the target rate of inflation and the actual rate of inflation (usually expressed as the deflator), based on the potential and actual growth rates of the economy. Determine the Federal Reserve's control rules and objectives for the federal funds lending rate, thus greatly stabilizing the public's policy expectations and improving the transparency of monetary policy. But by comparing the real Fed funds rate between the second quarter of 2000 and the third quarter of 2006 with the target rate modeled on the Taylor Rule, the Fed is now widely believed to have abandoned the rule in response to the bursting of the tech bubble [2].

The subprime mortgage crisis in the United States in 2008 and the crisis in the 1930s were both huge economic crises affecting the whole world, but they actually had different causes, circumstances, and mechanisms. In the prevention and management of similar major crises, simply applying the previous experience often leads to the neglect of the new factors, so that they can generate new crises with the help of new market mechanisms [3].

A simple equation to comprehend is the Taylor rule. The formula for the Taylor Rule is $r = p + .5y + .5(p-2) + 2$, where r is the federal funds rate, p is the average annual rate of inflation over the previous four quarters, and y is the output gap, or the percentage difference between the real GDP target and the actual GDP. The Taylor rule can thus be written as the simple equation target Interest Rate = Neutral Rate + 0.5 (Difference in GDP Rate) + 0.5. Variation in Inflation Rate It seeks to explain the Federal Open Market Committee's interest rate decisions (FOMC). According to the Taylor rule, interest rates should go up when inflation exceeds the target level or when GDP growth is significantly higher than expected.

The famous Taylor Rule links the prescription-setting of the overnight federal funds rate (the target rate for the FOMC when setting monetary policy) to two factors: (1) the percentage deviation between the current rate of inflation and policymakers' longer-run inflation objective; (2) The so-called output gap, which is the ratio of the current level of output (often measured in terms of real GDP) to the "normal" or "potential" level of output.

Thus, the Taylor Rule is as follows: 1). The Fed has kept nominal interest rates too low for too long; 2). Low nominal interest rates stimulate borrowing, and people use the extra capacity to buy homes, so the surge in demand pushes up house prices.

Financial markets can be categorized into the money market (greater than one year) and the capital market depending on how long the loan period is (more than one year). Additionally, the stock market and debt market, as well as the bond market, stock market, and mortgage market, are other divisions of the capital market. The bond buyback market, the commercial paper market, the interbank overnight loan market, and others are all part of the money market [4].

Monetary policy effectiveness refers to the amount of equilibrium income increase or decrease caused by a certain monetary expansion or contraction policy. If the increase or decrease is large, the effectiveness of monetary policy will be strong. If the increase or decrease is small, its effectiveness is weak. "Investment savings - liquidity preference - money supply" is the abbreviation for this phrase.

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One Keynesian macroeconomic model, the IS-LM model, describes the real goods and financial markets.

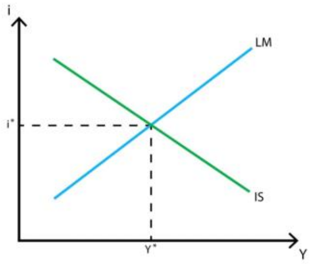

Figure 1: IS-LM model.

In the IS-LM model, the expansion or contraction of monetary policy is reflected in the movement of the LM curve. According to Hall and Taylor, the strength of the expansion or contraction of monetary policy can be measured by how far the LM curve with a given slope moves along the horizontal axis. In the simultaneous equilibrium model of product market and money market, the factors that affect the effectiveness of monetary policy can also be summed up into two categories, namely the slope of the IS curve and the slope of the LM curve [5].

3. Explanation

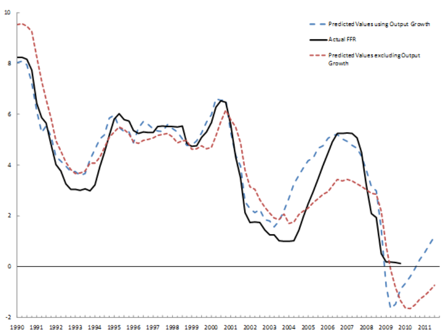

Figure 2: Actual and predicted FFR between 1990 and 2011 [6].

This chart shows the rise and fall of these three lines. The blue line is the Effective FFR, the red line is the Predicted FFR, and the green line is the Core CPI. There has been a sharp downward trend in both effective FFR and predicted FFR since January 1, 2001. The decline in Core CPI was gradual and began to increase in May 1, 2003. The predicted FFR showed a large increase in January 1, 2002, while the effective FFR began to show an increasing trend on May 1, 2004. As the diagram shows, at the trough in 2002, the government raised interest rates below 2%. There is a big gap between the real FFR and the forecast FFR. The model is a formula for expansionary monetary policy, which holds that economic prosperity caused by a shift in the MP curve moves downward and then increases inflation. According to the Taylor Rule, interest rates should be higher when inflation exceeds the target level or when output exceeds the potential level. According to Taylor, the Fed funds rate has a long-term real value of around 2%.

The federal funds rate should be equal to 2 plus the inflation rate when inflation and output are equal to the target, according to the Taylor's rule equation. Similar to this, the real federal funds rate should be equal to 2% when both inflation and output are at the target level.

Monetary policy can also be linked to housing starts, which represent the number of new homes being built each month. Monetary policy is crucial to the housing market because most people rely on mortgages to buy homes, as do construction companies. This means that interest rates and inflation are closely tied to these people, and if inflation is too high, the real value of the loan will be reduced.

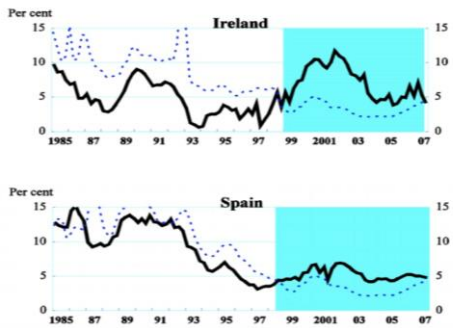

Figure 3: Taylor rule and actual interest rates between Ireland and Spain [7].

Compare housing bubbles in other countries (Ireland and Spain) in the early 2000s, as shown in the chart above. The blue line is the real interest rate, and the black line is the Taylor rate. The first chart shows the comparison of interest rates in Ireland. It is clear that real interest rates were higher than the Tate rate until 1999, but they have been on a downward trend. Between 1999 and 2007, the Taylor rate was higher than the real rate. In addition, Spain is similar to Ireland, though the difference between real and Tate rates is not very large.

4. Discussion

Alan Greenspan, chairman of the Federal Reserve from 1987 to 2006, admitted in 2007 that the housing bubble was “fundamentally engendered by the decline in real long-term interest rates” [8]. To deal with the crisis, the Federal Reserve Board lowered interest rates and raised home values to stimulate liquidity, but this was a failure. Through the above data survey results, it is clarified that under the Taylor rule, there are a lot of explanations and evidence to support the view that excessive expansionary monetary policy leads to the real estate bubble. According to the Taylor, the interest rate should set at its average rate plus effect of output gap and inflation gap. As the result of giving up on Taylor rule, Fed fail to avoid housing bust.

Overly expansionary monetary policy led to the housing bubble in the United States. Monetary policy itself is a tool to influence aggregate demand by using the interest rate, exchange rate, and money supply, while loose monetary policy represents a low interest rate, a low exchange rate, and high money supply.

Liu Hongru, president of the China Capital Market Research Society, believes that the direct cause of the financial crisis is the liquidity crisis and credit crisis caused by the excessive development of OTC derivatives and insufficient supervision [9].

Although China has so far kept a lid on the capital account, it has been flooded with dollars and global liquidity. Speculative funds still flow into China through the current account channel for arbitrage. Under the impact of international speculative capital, China's property market and the stock market. So much so that China's actual holdings of U.S. subprime bonds and other risky derivatives were not large, but they also suffered. The stock market decline and increased risks in the property market are also having an impact on China's real economy [10].

5. Conclusion

Base on discussion above, overly expansionary monetary policy is the main cause of housing bubble. FFR set interest rate too low to avoid crisis. However, whether monetary policy was the main reason

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for the 2008 financial crisis is controversial. Some factors that may contributed to the crisis are not discussed in this report. Nontransparent of securitization of mortgage assets leads to information asymmetries. In addition, the actual housing starts was dramatic high ,before 2008 financial crisis, around 2005 and those factors could leading to housing bubble are not only from U.S, but also appearing in other countries. Those may implement that the housing bust was inevitable.

This paper only uses some public data to analyze the phenomenon without obtaining more and more detailed materials for analysis. In addition, it cannot be ruled out that there are also other factors contributing to the bubble economy in the United States. Mr. Bernanke, for example, argues that financial innovation, and the deregulation and influx of foreign capital were the main culprits.

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