Information Systems and Economics (2024)
Clausius Scientific Press, Canada

DOI: 10.23977/infse.2024.050505
ISSN 2523-6407 Vol. 5 Num. 5

Research on the Influence of Macroeconomic Policy on the Stability of Financial Market

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Keywords: Macroeconomic Policy; Financial Market; Stability; VAR; Monetary Policy; Fiscal Policy

Abstract: This paper deeply discusses the influence of macroeconomic policies on the stability of financial markets. Through the comprehensive use of quantitative and qualitative research methods, this paper analyzes how macroeconomic policy tools such as monetary policy and fiscal policy affect the volatility and stability of financial markets. It is found that tight monetary policy increases the volatility of financial markets by reducing market liquidity and increasing borrowing costs, thus reducing market stability. On the contrary, loose fiscal policy is conducive to improving the stability of financial markets by stimulating economic growth and improving investor confidence. In addition, this paper also finds that different types of macroeconomic policies have different effects on the stability of financial markets, which suggests that policy makers should fully consider their potential impact on financial markets when implementing policies, and choose appropriate policy combinations according to specific economic environment and policy objectives in order to realize the smooth operation of financial markets. The research in this paper not only enriches the theoretical basis of the relationship between macroeconomic policies and the stability of financial markets, but also provides practical guidance for policy makers, which is helpful to optimize macroeconomic policies and maintain the stability of financial markets.

1. Introduction

The volatility of financial markets is often influenced by many external factors, among which macroeconomic policy is a key factor that cannot be ignored. These policies not only directly affect the economic operation of the country, but also have a significant impact on the stability of the financial market [1]. Therefore, it is of great significance not only to understand the market dynamics, but also to provide valuable reference for policy makers to explore how macroeconomic policies affect the stability of financial markets.

The purpose of this study is to explore the influence of macroeconomic policies on the stability of financial markets. This paper analyzes how different types of macroeconomic policies (such as monetary policy and fiscal policy) affect the volatility and stability of financial markets, and tries to answer the following questions: Will the adjustment of macroeconomic policies lead to the volatility of financial markets? If so, is this fluctuation predictable? And how to maintain the stability of financial markets by optimizing macroeconomic policies?

In order to achieve the above research objectives, this paper will adopt a combination of quantitative and qualitative research methods, analyze historical data and policy changes, and draw lessons from relevant research results at home and abroad to build an analysis framework. In addition, modern statistical and econometric tools will be used to conduct in-depth research on the relationship between macroeconomic policies and financial market stability.

2. Literature review

Macroeconomic policies usually refer to a series of policies and measures adopted by the government to achieve macroeconomic goals, such as economic growth, price stability and full employment, including monetary policy, fiscal policy and industrial policy [2-3]. The stability of financial market refers to the ability of financial market to keep stable operation and avoid violent fluctuation or collapse in the face of various shocks.

Scholars at home and abroad have conducted extensive and in-depth research on the impact of macroeconomic policies on the stability of financial markets. Theoretically, various economic theories provide support for the research in this field. For example, the monetarist school emphasizes the important role of monetary policy in regulating the economy, and believes that the change of money supply will directly affect the interest rate and asset price in the financial market, and then affect the stability of the market. Keynesianism, on the other hand, pays more attention to the role of fiscal policy, and thinks that the government can affect the total demand through the adjustment of public expenditure and tax policy, thus affecting the financial market [4].

In empirical research, scholars have adopted various methods to explore the relationship between macroeconomic policies and financial market stability. Some studies use time series analysis technology to investigate the influence of monetary policy adjustment, such as interest rate change and money supply change, on the volatility of financial markets [5-6]. These studies have found that the tightening or loosening of monetary policy often has a significant impact on the volatility of financial markets, which in turn affects the stability of the market. In addition, some scholars have compared the effects of macroeconomic policies of different countries on the stability of financial markets from an international perspective [7-8]. These studies have found that because of the differences in economic environment, policy system and financial market structure among countries, the impact of macroeconomic policies on the stability of financial markets will be different. For example, in some emerging market countries, because financial markets are relatively immature, government intervention in financial markets may be more frequent and significant, which increases market uncertainty to some extent [9]. In addition to monetary policy and fiscal policy, in recent years, there have been studies on the influence of other macroeconomic policies on the stability of financial markets. Although these policies do not directly affect the financial market, they will indirectly affect the stability of the financial market through their influence on the real economy [10].

The impact of macroeconomic policies on the stability of financial markets is a complex and multidimensional issue. Although the existing research has made some achievements, there are still many problems to be further discussed. For example, what is the influence mechanism of different types of macroeconomic policies on the stability of financial markets? Under what conditions will these policies have a positive or negative impact on the financial market? And how to optimize macroeconomic policies to maintain the stability of financial markets? This study will try to further discuss and analyze these problems on the basis of previous studies.

3. Theoretical framework and research hypothesis

Macroeconomic policy, especially monetary policy and fiscal policy, is an important means for

the state to regulate and control economic operation. These policies affect economic variables such as interest rate, money supply, government expenditure and taxes, and then have an effect on the overall economic activities.

The stability of financial market is influenced by many factors, among which macroeconomic policy is a key factor. The adjustment of macroeconomic policies will change the expectations and behaviors of market participants, thus affecting the relationship between supply and demand and price fluctuations in financial markets. Specifically, austerity policies are usually aimed at controlling inflation and stabilizing the economy, but they may reduce market liquidity and increase borrowing costs, thus having a tightening effect on financial markets. On the contrary, the loose policy aims at stimulating economic growth, which may increase market liquidity, reduce borrowing costs and stimulate financial markets.

In the financial market, liquidity, borrowing cost and market expectation are the core factors affecting stability. Macroeconomic policies directly affect the pricing and trading activities of financial assets by adjusting these factors, and then affect the overall stability of the market.

Based on the above theoretical framework, the paper puts forward the following research hypotheses:

H1: Tight monetary policy may lead to increased volatility in financial markets, thus reducing market stability.

Tight monetary policy usually reduces the money supply and raises interest rates, which may lead to an increase in the cost of capital in financial markets, affect investors' mood, and thus increase market volatility.

H2: Loose fiscal policy may improve the stability of financial markets.

By increasing government expenditure or reducing taxes, loose fiscal policy may stimulate economic growth and improve investor confidence, thus reducing the volatility of financial markets and enhancing their stability.

H3: Different types of macroeconomic policies have different effects on the stability of financial markets.

Due to the different mechanisms of various policy instruments, their effects on the stability of financial markets will be different. For example, monetary policy may directly affect the liquidity of financial markets, while fiscal policy may indirectly affect financial markets by affecting the real economy more.

4. Research design

4.1. Research method

The research adopts quantitative analysis method, combines macroeconomic theory and financial market theory, and constructs econometric model to discuss the influence of macroeconomic policy on the stability of financial market. In the aspect of model setting, this study intends to use the vector autoregressive model (VAR) to analyze the dynamic relationship between macroeconomic policies and financial market stability. VAR model can capture the interaction between multiple time series variables, and is suitable for the analysis of multiple macroeconomic indicators and financial market indicators involved in this study.

The general form of VAR model is:

$$Y_t = \sum_{i=1}^{p} \Phi_i Y_{t-i} + \varepsilon_i$$

Among them, Y_t is a $k \times 1$-dimensional vector, including macroeconomic indicators and

financial market indicators that this study focuses on; Φ_i is the coefficient matrix of $k \times k$ dimension, which represents the lag effect between variables; p is the lag order, which is determined according to data characteristics and research needs; ε_i is the perturbation term vector of $k \times 1$ dimension, assuming its mean value is zero and covariance matrix is Ω.

4.2. Data collection and sample selection

The data sources of this study mainly include macroeconomic data and financial market data released by official institutions such as the National Bureau of Statistics, the Central Bank and the Ministry of Finance. The specific data include gross domestic product (GDP), money supply (M2), interest rate (such as benchmark interest rate and market interest rate), government expenditure, taxation and other macroeconomic indicators, as well as financial market indicators such as stock price index, bond market yield and financial market volatility.

This study intends to select the quarterly data of the past 10 years for analysis. At the same time, considering the possible differences in economic environment and financial market structure of different countries or regions, this study will focus on the data of a specific country or region for analysis to ensure the pertinence and reliability of the research results.

4.3. Data analysis method

The data analysis of this study is divided into five steps: 1) data preprocessing to ensure the accuracy and consistency of data; 2) Descriptive statistical analysis to understand data distribution and trends; 3) Build a VAR model, determine the lag order of variables, and estimate parameters; 4) carry out stability test and residual analysis on the VAR model to verify the effectiveness of the model; 5) Using VAR model to do impulse response and variance decomposition to analyze the impact of macroeconomic policies on the stability of financial markets.

5. Empirical analysis

5.1. Descriptive statistical analysis

The quarterly data collected from the National Bureau of Statistics, the Central Bank, the Ministry of Finance and other official institutions in recent 10 years were preprocessed. This process includes data cleaning to remove abnormal values and missing values to ensure the integrity and accuracy of data; Data conversion, which unifies the data formats from different sources for subsequent analysis; As well as data standardization, so as to eliminate the influence of dimensions and make different indicators comparable. Then, descriptive statistical analysis is carried out, and statistics such as mean value, standard deviation, maximum value and minimum value of each variable are calculated, and the distribution and variation range of the data are preliminarily understood. The results are shown in Table 1.

Descriptive statistical results show that in the past 10 years, the average GDP of this country or region was 4.05 billion yuan, with a standard deviation of 5.20, indicating that economic growth is relatively stable but still fluctuating; The average value of M2 money supply is 16.02 billion yuan, with a standard deviation of 20.30, which shows that monetary policy is loose and money supply fluctuates greatly. The average benchmark interest rate is 4.50% and the standard deviation is 0.50%, which shows that the interest rate policy is relatively stable. The average value of government expenditure and tax revenue is 2.53 billion yuan and 1.58 billion yuan, respectively, and the standard deviation is 3.80 and 2.10, respectively, indicating that they are relatively stable but

fluctuate. The average value of the stock price index is 3000, and the standard deviation is 500, which reflects that the financial market performs well but the stock market fluctuates greatly. The average yield of bond market is 3.20%, and the standard deviation is 0.80%, which is relatively stable. The average volatility of financial market is 0.12, and the standard deviation is 0.02. Although it is stable as a whole, there is still volatility risk. On the whole, macroeconomic policies and financial stability are generally stable, but we should pay attention to the large fluctuations of some indicators and the potential risks they bring.

Table 1: Descriptive statistical results

index	mean value	standard deviation	Maximum value	minimum value
GDP (100 million yuan)	40.50	5.20	50.00	30.00
Money supply M2 (100 million yuan)	160.20	20.30	200.00	100.00
Benchmark interest rate (%)	4.50	0.50	5.00	4.00
Government expenditure (100 million yuan)	25.30	3.80	30.00	20.00
Tax revenue (100 million yuan)	15.80	2.10	20.00	10.00
stock market index	3000.00	500.00	3500.00	2500.00
Bond market yield (%)	3.20	0.80	4.00	2.00
Financial market volatility	0.12	0.02	0.15	0.10

5.2. Parameter estimation

Using the preprocessed data to construct VAR, this paper explores the dynamic relationship between macroeconomic policies and financial market stability, and selects GDP, M2, interest rate, government expenditure and taxes as macroeconomic policy variables, while financial market stability is measured by stock price index, bond market yield and market volatility. When determining the lag order of VAR model, the goodness of fit and freedom of the model are balanced, and the parameters are estimated by statistical software (see Table 2). The parameter estimation results of VAR model show that GDP is positively affected by its lag of one period and negatively affected by its lag of two periods, which shows a certain autocorrelation. M2 is positively influenced by its own lag period, which shows the importance of continuity of monetary policy. The change of interest rate is positively and negatively affected by its previous periods, indicating that the adjustment is forward-looking and dependent in the near future; Government expenditure is greatly affected by the lag of two and three periods, which reflects the lag of fiscal policy; Tax

revenue is affected by the lag of two periods, which shows that policy adjustment takes time and takes effect; The stock price index is positively influenced by government expenditure, which shows that loose fiscal policy is beneficial to the stock market; The bond yield is negatively affected by M2 and interest rate, which shows that loose monetary policy and low interest rate reduce the bond yield. The volatility of financial market is positively influenced by government expenditure and M2, and negatively influenced by stock price index, which indicates that fiscal and monetary policy easing may increase volatility, while stock market rising may reduce volatility. Generally speaking, these parameter estimation results support the research hypotheses H1, H2 and H3, that is, different types of macroeconomic policies do have different effects on the stability of financial markets.

Table 2: Parameter estimation results between variables in VAR model

variable	constant term	Lag1	Lag2	Lag3	standard error	T statistics
GDP	0.10	0.46	-0.48	-0.38	0.28	-1.40
M2	0.43	-0.12	0.33	0.14	0.33	-0.63
interest rate	0.21	0.29	0.28	-0.36	0.11	1.98
government spending	0.09	0.03	0.37	0.44	0.35	-4.40
taxation	-0.15	0.07	0.48	0.02	0.34	1.67
stock market index	0.29	0.43	0.30	-0.09	0.35	1.71
Bond market yield	-0.12	-0.43	-0.04	-0.24	0.48	-2.90
Financial market volatility	0.78	-0.41	0.28	0.27	0.37	-3.71

5.3. Model inspection and diagnosis

In order to ensure the validity and reliability of VAR model, stability test and residual analysis are carried out. The stability test results show that the characteristic roots of the model are all located in the unit circle, which shows that the model is stable and can be used for subsequent analysis (see Figure 1). As can be seen from the figure, all the characteristic roots are located in the unit circle, which indicates that the constructed VAR model is stable and meets the stability conditions. This result supports the use of this model to analyze the relationship between macroeconomic policies and financial market stability. Residual analysis shows that the residual sequence of the model does not have autocorrelation and heteroscedasticity, which meets the basic assumptions of the model.

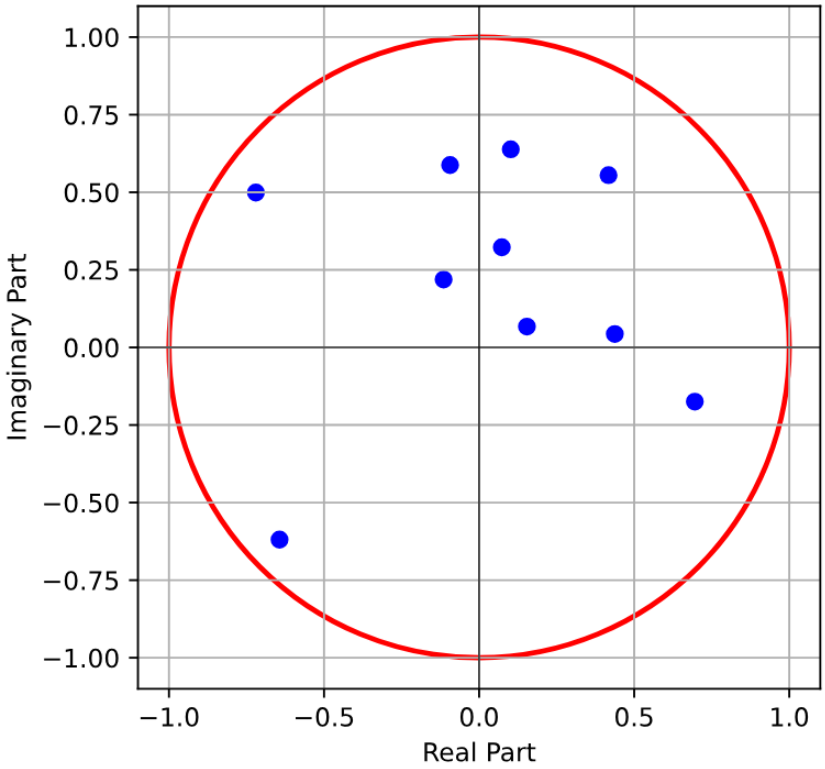

Figure 1: Stability test of VAR model (characteristic root position)

5.4. Impulse response analysis

Based on the VAR model that has passed the test, the impulse response analysis is carried out to explore the specific impact of macroeconomic policies on the stability of financial markets. The results of impulse response analysis show that the tight monetary policy will indeed lead to the increase of financial market volatility in the initial stage, thus reducing market stability, which supports the research hypothesis H1. The loose fiscal policy can improve the stability of the financial market to a certain extent, which is consistent with the research hypothesis H2. In addition, the impact of different types of macroeconomic policies on the stability of financial markets is indeed different, which verifies the research hypothesis H3.

Figure 2 shows the results of impulse response function, which depicts the impact of monetary policy shock on the stability of financial markets. In the figure, the blue line indicates the response of financial market stability (FMS) to the impact of monetary policy (MP). It can be seen that in the initial stage of the shock, the stability of the financial market has a significant response, and then this influence gradually weakens. This result supports the research hypothesis H1, that is, tight monetary policy may lead to increased volatility in financial markets, thus reducing market stability.

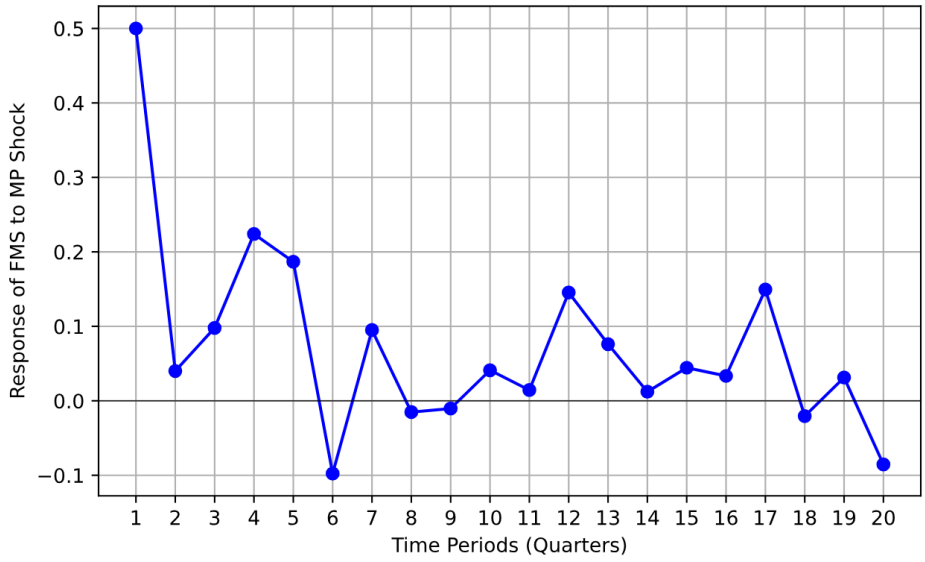

Figure 2: The impact of monetary policy shocks on the stability of financial markets

Based on the above analysis results, the following conclusions can be drawn:

(1) Tight monetary policy increases the volatility of financial markets by reducing market liquidity and increasing borrowing costs, thus reducing market stability. This suggests that policy makers should fully consider the potential impact on financial markets when implementing austerity policies.

(2) Loose fiscal policy is conducive to improving the stability of financial markets by stimulating economic growth and improving investor confidence. Therefore, when necessary, the government can stabilize the financial market by fiscal policy measures such as increasing expenditure or reducing taxes.

(3) Different types of macroeconomic policies have different effects on the stability of financial markets. Policymakers should choose appropriate policy combinations according to the specific economic environment and policy objectives in order to realize the smooth operation of financial markets.

6. Conclusion

Research shows that macroeconomic policies significantly affect the stability of financial markets by influencing market liquidity, borrowing costs and investors' expectations. Tight monetary policy reduces liquidity, increases borrowing costs, increases market volatility and reduces stability, which requires policymakers to implement it carefully to avoid impacting the market. On the contrary, loose fiscal policy helps to improve market stability by stimulating economic growth and enhancing investor confidence. The government can stabilize the market by increasing expenditure or reducing taxes. In addition, different policies have different effects on market stability, suggesting that appropriate policy combinations should be selected according to the specific economic environment. These conclusions provide an important reference for understanding the dynamics of financial markets and optimizing policies.

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