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Differentiation of economic and financial cycles and the logic of China's monetary policy reform

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Differentiation of economic and financial cycles and the logic of China's monetary policy reform

China's
monetary
policy reform

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Abstract

Purpose – In recent years, with the gradual differentiation of economic and financial cycles, it has been increasingly difficult for monetary policies to remain balanced in stabilizing both economy and finance. Taking the period of 1999–2017 as a sample, the purpose of this paper is to find whether the synergy between the growth cycle and the price cycle is constantly improving in the economic cycle is more appropriate.

Design/methodology/approach – The key to stabilizing the economic cycle lies in the monetary policy and it should abandon the goal of boosting growth in a timely manner and turn into the goal of maintaining steady growth. At present, quantitative monetary policy is still more effective than price-oriented monetary policy in smoothing the economic cycle.

Findings – The impact of quantitative regulation on the financial cycle is more neutral, whereas price regulation will increase the volatility of price and financial cycles in the course of smoothing the growth cycle. In view of the continuous differentiation between the economic and financial cycles, it is realistic and reasonable to accelerate the establishment of a sound dual-pillar regulatory framework of “monetary policy and macro-prudential policy.”

Originality/value – The macro-prudential policy is specially used to smooth the financial cycle, so as to reduce the burden and increase the efficiency of the monetary policy on regulating economic cycle. Moreover, the transformation of monetary policy to price-oriented regulation must keep pace with the construction of the dual-pillar regulation framework and complement each other to prevent undesirable consequences in the financial sector. On the other hand, monetary policy still needs to rely on quantitative regulation in the future. The research in this paper also provides a new perspective for understanding the internal and external reform of China's monetary policy in recent years.

Keywords Monetary policy, Economic cycle, Financial cycle, Macro-prudential policy

Paper type Research paper

1. Introduction and literature review

Before the 2008 international financial crisis, the monetary policy of western developed countries was focused on price stabilization. Traditional economic theory holds that price stability is the core of monetary policy regulation and control, which helps achieve other objectives such as output stability and financial stability (Schwartz, 1995; Issing, 2003). Since the 1980s, the characteristics of “low inflation, high growth and low unemployment” presented by the “Great Moderation” of western economy have proved the superiority of inflation targeting monetary policy in practice. However, with the increasing complexity of economic and financial relations, the synergistic relationship between price stability and financial stability becomes weaker and weaker. The 2008 financial crisis has profoundly demonstrated that the monetary policy of stabilizing prices has in fact been unable to guarantee financial stability. There is even a view that the central bank is limited to stabilizing prices, so the pressure of price rising shifts from the entity sector to the virtual



sector, so that asset price bubbles in some countries occur when prices are relatively stable. Trichet (2005) described this phenomenon as “Paradox of Central Bank Credibility.” What the goal inconsistency between economic stability and financial stability reflects is the new normal of the differentiation and even deviation between economic and financial cycles in recent years.

According to Marx, financial volatility not only manifests the real economy volatility, but also follows an increasingly independent law of cyclical movement, which could be the source of economic cyclical changes (Yinxing *et al.*, 2005). Facts have proved that this insight is becoming a reality. Since the financial crisis, the relationship between financial cycle and economic cycle has rapidly become a hot topic in macroeconomics (Borio, 2014). Claessens *et al.* (2012) analyzed the panel data of 44 countries and found that there was a significant correlation between the economic cycle and the financial cycle at different stages. Drehmann *et al.* (2012) calculated the financial cycle of each country through filtering and decomposition of the quarterly data of the seven industrial countries from 1960 to 2011 and found that the volatility of the financial cycle was generally larger than that of the economic cycle and financial crisis often broke out after the peak of the financial cycle. Deng Chuang and Xu Man (2014) analyzed the time-varying impact of China’s financial cycle on macro-economy and its asymmetric characteristics by constructing financial situation index and combining TVP-VAR model. Ma Yong *et al.* (2016) comprehensively analyzed the impact of financial cycle, monetary cycle and credit cycle on economic cycle and found that financial cycle is not only an important factor driving the economic cycle, but also a good predictor of the economic cycle change. Fan Xiaoyun *et al.* (2017) used quarterly data to measure China’s financial cycle and analyzed its correlation with the economic cycle. They also found that the financial cycle had a larger volatility range than the economic cycle and had a significant leading amplification effect. The panel data analysis of 68 countries by Chen Yulu *et al.* (2016) shows that whether the financial cycle expands or declines, both economic growth and financial stability will be adversely affected.

By calculating China’s financial cycle and comparing it with the growth and price cycles in the economic cycle, this paper finds that: first, the synergy between the growth cycle and the price cycle is constantly increasing, which indicates that the internal consistency of the economic cycle is constantly improving, while the synergy between the financial cycle and the economic cycle is first strengthened and then weakened, showing an “inverse U-shaped” relationship. Second, from 2012 to now, the financial and economic cycles have shown obvious differentiation or even deviation, which indicates that the short-term macro-control based on monetary policy can no longer smooth the economic cycle and financial cycle at the same time. It is necessary to adopt pertinent regulation and control for different cycles in order to achieve a targeted goal. In the past, due to the strong “GDP Complex” of governments at all levels and the lack of independence of the central bank, China’s monetary policy in fact took the promotion of economic growth as the top priority and price stability was forced to be subordinate. With economic expansion having moderated to a “new normal” pace, the systemic risk of financial system will increase significantly. The effectiveness of monetary policy is facing great challenges. How should the effectiveness of monetary policies be further improved under the new normal of constant differentiation of economic and financial cycles? How to make macro-control better serve economic and financial stability? To this end, this paper will give answers through quantitative analysis and put forward practical and clear policy recommendations.

2. Economic and financial cycles: from convergence to differentiation

2.1 Measurement of economic and financial cycles

For the economic cycle, the academic circles usually take output and price as the benchmark to measure its variables. However, for the description of financial cycle, there is no unified

understanding at present. Most previous literatures simply used credit/GDP or M2/GDP as proxy variables in the financial cycle (Levine *et al.*, 2000; Schularick and Taylor, 2009; Yulu *et al.*, 2016). Although credit and broad monetary volume are the key indicators of macro-financial operation, they cannot reflect the overall financial situation in a more comprehensive way after all, and in particular, they cannot reflect with pertinence the operating situation of real estate market and financial markets such as securities and insurance. However, it is the extreme volatility in these areas that triggered the 2008 international financial crisis. Borio (2014) proposed that the total credit and real estate prices are the basic variables to measure the financial cycle. “China Monetary Policy Report” for the third-quarter of 2017 also pointed out that the two core indicators to judge the financial cycle are broad credit and real estate prices, in which the former represents financing conditions while the latter reflects investors’ perception of risks. In view of this, credit, credit/GDP, real estate price and stock price are selected by Fan Xiaoyun *et al.* (2017) to calculate the financial cycle. Through principal component analysis, Deng Chuang and Xu Man (2014) constructed a comprehensive financial condition index covering stock market, bond market, foreign exchange market, real estate, currency market and banking system to measure China’s financial cycle.

This paper constructs an Aggregate Financial Stability Index (AFSI) to measure China’s financial cycle. Specific measures are as follows: First, on the basis of the content and main structure of “China Financial Stability Report” issued by the People’s Bank of China in 2017, 18 indicators are selected to synthesize a comprehensive index[1] representing the overall financial operations from six dimensions: banking system, securities industry, insurance industry, real estate industry, domestic economy and open economy. Then, factor analysis is used to reduce the dimension, and five common factors with the strongest explanatory power for the overall financial volatility are synthesized and the total factor AFA is constructed according to the corresponding weights[2]. Finally, the periodic components of AFA are extracted by HP filter to secure AFSI, which is used to demonstrate the volatility characteristics of the overall financial situation deviating from the trend. A positive index indicates financial overheating, whereas a negative index indicates financial cooling.

Specifically, the quarterly data from 1999Q1 to 2017Q4 are selected for periodic description. The data comes from IFS database, OECD database, WIND database, CSMAR database, CEInet Statistics Database, the website of the National Bureau of Statistics and the website of the People’s Bank of China. HP filter is used to eliminate the trend components of GDP year-on-year growth rate and year-on-year CPI, and the periodic components are retained to represent the growth and price cycles, respectively. HP filter and factor analysis are used to synthesize AFSI to represent financial cycle. KMO measure of sampling adequacy and Bartlett’s test of sphericity are applied to standardized variables. The results show that the KMO value is 0.64, greater than 0.5, and the *p*-value of Bartlett’s test of sphericity is 0.00, less than 0.05. Therefore, factor analysis is applicable to sample data. Five factors were selected according to the criterion of eigenvalue greater than 1. The results of variance contribution rate and eigenvalue factor analysis were shown in Table I. The total factor $AFA = 0.4FA1 + 0.19FA2 + 0.16FA3 + 0.13FA4 + 0.13FA5$ and the cumulative interpretation ability reached 79 percent, which indicated that factor analysis had a positive effect.

2.2 The relationship between economic and financial cycles

Figure 1 shows the trend of China’s growth, price and financial cycles from 1999 to 2017. As shown in the figure, the three major cycles were significantly volatile before 2012, but the trend of financial cycle was basically the same as that of economic cycle represented by growth and price cycles. Since 2012, the volatility of the economic cycle has decreased significantly, but the volatility of the financial cycle is still large, which leads to the gradual differentiation of the financial and economic cycles, or even obvious directional deviation at some nodes.

Table II calculates the synergy between different periods by using correlation coefficient. The increasing synergy between growth and price cycles indicates that it is increasingly difficult for monetary policy to achieve the two goals of controlling price and boosting growth at the same time. Therefore, for the current economy, the vision of “stabilizing the currency value and intending to boost economic growth with it” stipulated in “Law of the People’s Bank of China” has been out of date. The legal target of monetary policy for growth is thus urgently advised to change from boosting to stabilizing the growth, so that the coordinated operation of the growth and price cycles should institutionally be guaranteed. Sticking to the goal of boosting growth can only undermine the inherent consistency of the economic cycle. Since 2012, the financial and the price cycles have run counter to each other, indicating that monetary policy alone can no longer smooth both the economic and financial cycles at the same time. It is necessary to adopt targeted control measures for the two major cycles so as to achieve a desired goal. Therefore, we have to accelerate the construction and improvement of the dual-pillar regulatory framework of “monetary policy and macro-prudential policy,” and use macro-prudential policy specifically to achieve a smooth financial cycle, so as to reduce the burden and increase efficiency of monetary policy in stabilizing the economic cycle.

Table I.
Factor analysis results

| Synthetic factors | Eigenvalues | Contribution rate of variance (%) | Cumulative variance contribution rate (%) | The proportion of variance explained (%) |
|-------------------|-------------|-----------------------------------|---|--|
| FA1 | 5.3 | 0.31 | 0.31 | 40 |
| FA2 | 2.53 | 0.15 | 0.46 | 19 |
| FA3 | 2.1 | 0.12 | 0.58 | 16 |
| FA4 | 1.75 | 0.1 | 0.69 | 13 |
| FA5 | 1.74 | 0.1 | 0.79 | 13 |

Figure 1.
China’s growth, price and financial cycles

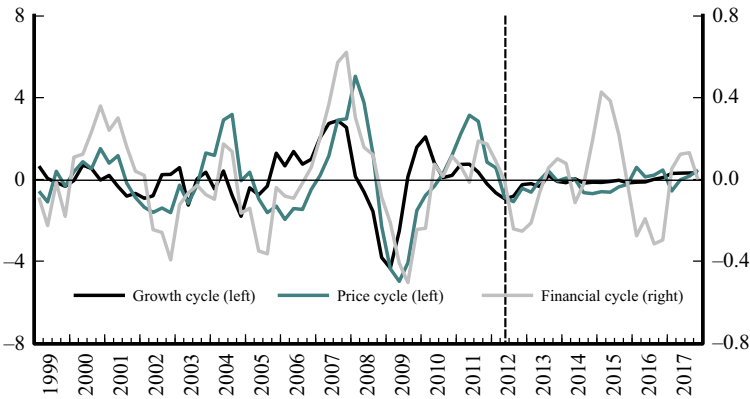


Table II.
Synergies between different cycles

| Correlation coefficient | Growth and price cycles | Growth and financial cycles | Price and financial cycles |
|-------------------------|-------------------------|-----------------------------|----------------------------|
| Full sample | 0.3882 | 0.3461 | 0.6111 |
| 1999Q1–2005Q4 | 0.0933 | 0.1382 | 0.6718 |
| 2006Q1–2012Q1 | 0.4400 | 0.4632 | 0.7933 |
| 2012Q2–2017Q4 | 0.6123 | 0.2050 | –0.2797 |

Table III shows that the growth and price cycles are mutually actuated, whereas the financial and price cycles are mutually not; the growth cycle is the driving factor of the financial cycle, but not vice versa. It can be seen that monetary policy can stabilize the growth cycle while anchoring the price cycle, but cannot stabilize the financial cycle. If monetary policy focuses obsessively on the financial cycle, it will weaken the regulation of the price cycle and even the growth cycle. Therefore, macro-prudential policy must be introduced and coordinated with monetary policy. In addition, China's monetary policy goal for growth at this stage urgently needs to change from boosting to stabilizing the growth. The stable growth cycle can help stabilize the price and financial cycles to a certain extent, but boosting growth will cause sharp volatility in the economic and financial cycles.

In the past, China's monetary policy has always been "growth oriented," which emphasizes steady development, but an easing monetary policy in practical terms. The Central Economic Working Conference held at the end of 2016 first proposed that "monetary policy should be stable and neutral," which further constrained the initiative of monetary policy expansion and created a stable policy environment for genuinely smoothing the economic and financial cycles. At present, due to the escalating trade frictions with the USA, although monetary policy has temporarily turned steady, there is no doubt that the neutral monetary policy is the ultimate direction of evolution. The growth-promotion-oriented monetary policy usually stimulates the economy and makes it grow too fast, which shows that the GDP growth rate is positively deviating from the trend level. At the same time, it will also drive the financial operation to be overheated. When the policy benefits disappear, the reversal effect of excessive adjustment can easily lead to financial instability. A three-variable VAR model including growth, price and financial cycles is constructed to analyze the dynamic response path of price and financial cycles under the background of stimulating growth cycle expansion. Figure 2 shows the cumulative path of dynamic response of price and financial cycles when the cyclical volatility of GDP growth increases by one unit of standard deviation. It can be seen that excessive economic growth will cause simultaneous expansion of price and financial cycles, demonstrated by high prices and overheated financial markets. High prices are not conducive to long-term economic

Table III.
Granger causality
analysis in identifying
cycle driving factors

| Null hypothesis | No. of observations | F-inspection quantity | p-value | Whether it is the driving factor |
|---|------------------------|--------------------------|---------|--|
| Price cycle is not the driving factor of growth cycle | 74 | 9.16141 | 0.0003 | Yes |
| Growth cycle is not the driving factor of price cycle | 74 | 8.96579 | 0.0003 | Yes |
| Financial cycle is not the driving factor of growth cycle | 74 | 2.27213 | 0.1108 | No |
| Growth cycle is not the driving factor of financial cycle | 74 | 8.78724 | 0.0004 | Yes |
| Financial cycle is not the driving factor of price cycle | 74 | 0.73243 | 0.4844 | No |
| Price cycle is not the driving factor of financial cycle | 74 | 0.87383 | 0.4219 | No |

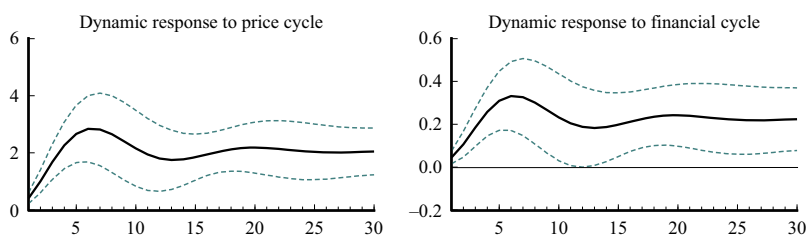


Figure 2.
Dynamic effect of
growth cycle
expansion on price
and financial cycles

development, and on the other side financial overheating can easily induce systemic risks, which are all the potential additional costs of growth-oriented policy. Eliminating GDP performance orientation and setting up a reasonable and moderate target of stabilizing growth are the primary prerequisites for smoothing the macroeconomic and financial cycles at present.

3. Monetary policy regulation: quantity oriented or price oriented?

With the rapid development of financial innovation and market, the performance of traditional quantitative monetary policy with M2 as the intermediary target is gradually declining. In 2016, a broader range of social financing has been taken as a new policy objective, but it is still unable to accurately grasp the financial market activities represented by non-credit financing. Since 2018, China has stopped announcing the quantitative targets of M2 and social financing scale, which indicates that the transformation of the monetary policy regulatory framework has taken another important step (Xu, 2018). However, the price-oriented monetary policy regulation requires a high degree of market development and transmission mechanism. At present, China's monetary and bond markets are still fragmented. The coexistence of benchmark deposit rate, benchmark lending rate and market-oriented interest rate such as Shibor is still equivalent to the *de facto* dual-track system (Gang, 2018). Guo Yumei *et al.* (2016) pointed out that in the transformation process of monetary policy shifted from quantity to price, neither the credit channel nor the interest rate channel can fully function, and suggested that monetary policy should strengthen anticipation management, which would help to make up for its declining effectiveness; Wu Ge and Lian Fei (2016) argued that a hybrid monetary policy framework oriented by both quantity and price is a better choice at present.

In this part, with the background of the recent-year differentiation of economic and financial cycles in China being the starting point, the impact of quantitative and price-oriented regulation of monetary policy upon economic and financial cycles is discussed. The advantages and disadvantages of quantitative and price-oriented regulation are compared from the perspective of improving the effectiveness of monetary policy, and practical suggestions on further improving short-term macro-control policies are put forward in order to make the economic and financial cycles smoother. Generalized money supply (M2) and seven-day Shibor interest rate are selected as the proxy variables of quantitative and price-oriented intermediary targets of monetary policy. The sample is the quarterly data from 1999Q1 to 2017Q4. The data come from the CEInet Statistics Database. After seasonal adjustment of X12, three groups of VAR models are constructed, respectively, with growth, price and financial cycles' variables to analyze the economic and financial volatility effects of different monetary policy regulation modes.

By analyzing the dynamic effects of monetary and interest rate shocks on growth, price and financial cycles, the effects of quantitative monetary policy and price-oriented monetary policy on smoothing the output, price and financial volatilities can be judged. Figure 3 shows that: first, positive monetary shocks can stimulate positive output volatility, which corresponds to the rising stage of the growth cycle; at the beginning of the period, they will lead to negative price volatility to a lesser degree, but then they will stimulate significant positive price volatility, and the price cycle will rise; the impact on financial volatility will be negative first, then positive. Generally, it will remain neutral and the financial cycle has barely been budged; yet there is little research on this point at present. Second, at the beginning of the period of positive interest rate shocks, there will be slight positive output volatility, but then it will lead to obvious negative volatility of output and the decline of growth cycle; the impact on price volatility will be positive, then negative and the price cycle will rise in general; the impact on financial volatility will be obviously positive, and the financial cycle will rise.

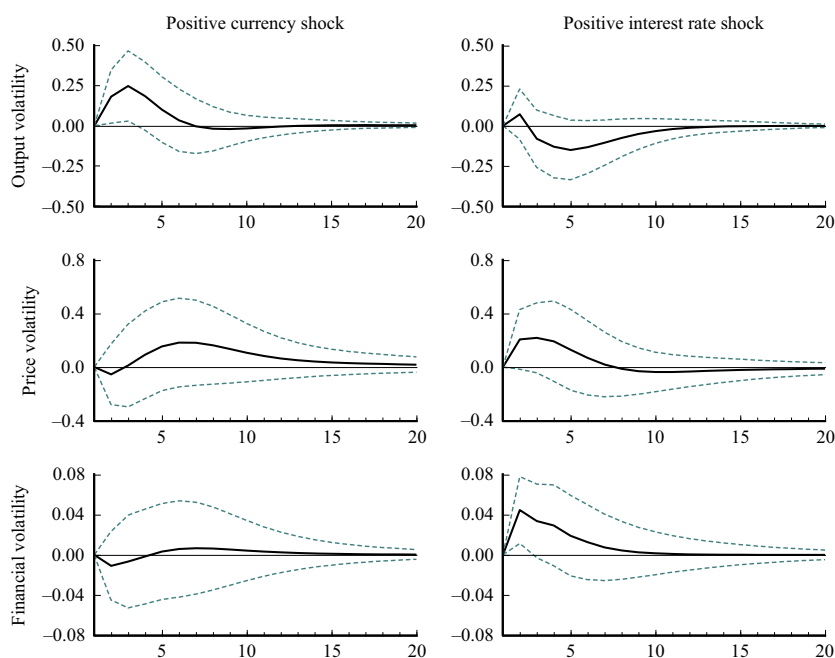


Figure 3.
Dynamic effects of
currency and interest
rate shocks on
volatility of cyclical
variables

Generally speaking, first, under the quantitative regulation, output volatility is consistent with price volatility in the broad direction. Output volatility precedes price volatility. There is good synergy between growth and price cycles, and the impact of quantitative regulation on financial volatility is relatively neutral, which can make monetary policy avoid additional disturbance to the financial cycle when smoothing the economic cycle. Second, under price-oriented regulation, monetary policy tightening interest rates will lead to inflation, indicating that there exists a significant cost channel effect (Fangping and Yujun, 2010; Hai and Zhuzhen, 2011). The output volatility and price volatility run counter to each other, indicating that it is difficult for monetary policy to stabilize the growth and price cycles at the same time, and the impact of price-oriented regulation on financial volatility is very significant. At this time, there will be a trade-off between stabilizing the economic and financial cycles.

Therefore, under the background of the increasing synergy between growth and price cycles, the convergence of quantitative regulation will help to achieve the goal of smoothing the economic cycle and will not have a non-neutral impact on the financial cycle. Therefore, when the quantitative monetary policy is used to regulate the real economy, it will neither destroy the inherent synergy of the economic cycle nor obviously interfere with the financial cycle. When the price-oriented regulation to act on the real economy is used, we will face the regulatory dilemma of “solving one problem only to find another cropping up,” which cannot only eliminate the internal conflicts in the economic cycle but also have a significant non-neutral impact on the financial cycle. Therefore, we must adopt macro-prudential policies to specifically make the financial cycle smooth and resolve the negative effects of price-oriented monetary policy regulation in the financial sector. It can also be seen from this point that, while actively boosting the transformation of monetary policy from being quantitative to

being price-oriented, China is also actively building a dual-pillar regulatory framework of “monetary policy and macro-prudential policy,” which fully conforms to the current economic operation law.

4. Interpretation of the internal logic of China’s monetary policy reform

For a long time, macroeconomic policy mix in China has been focusing on “proactive fiscal policy and prudent monetary policy” and lack of macro-prudential policy, which leads to the extensive financial services to the real economy, and the potential financial risks accumulate gradually with economic development. Ever since the time of entering the economic new normal, both the real economy and virtual economy have undergone profound changes and adjustments. While the trend of economic growth has slowed down, the marginal effect of stimulus policies has been sharply reduced and risks in the financial sector have been exposed. This “sequela of growth deceleration” forces monetary policy regulation to waver on stabilizing financial markets and serving entities. The research results of this paper show that the policy orientation of boosting growth tends to cause the simultaneous expansion of price and financial cycles, which is not conducive to the long-term economic development and financial stability. The monetary policy should timely adjust its target for growth from boosting to stabilizing; and in the background of the increasing synergy between the growth and price cycles, the goal of stabilizing growth and the goal of stabilizing price are inherently consistent, thus avoiding frequent shifts in monetary policy between economic stability and stimulus, and improving the predictability and coherence of monetary policy. From this point of view, the “monetary policy should be stable and neutral” first proposed at the Central Economic Working Conference held at the end of 2016 has restricted the monetary policy goal of boosting growth to some extent. In the future, the relationship between monetary policy and economic growth in the “Law of the People’s Bank of China” should be further adjusted to clarify the economic stabilization function of monetary policy.

The study also finds that China’s financial and economic cycles show obvious differentiation or even deviation from one another since 2012, which indicates that relying solely on monetary policy can no longer make the economic and financial cycles smooth at the same time. According to Tinbergen’s rule, the number of economic policies of a country must be at least equal to that of economic objectives, and the independence between policies must be maintained. Under the general differentiation trend of economic and financial cycles, a single monetary policy cannot achieve the two goals of stabilizing economic and financial cycles at the same time. The Report of the Nineteenth National Congress in 2017 officially put forward the “sound monetary policy and macro-prudential policy dual-pillar regulatory framework” to smooth the economic cycle with monetary policy and the financial cycle with macro-prudential policy. This reform logic of targeted and classified regulation conforms to the theoretical law and current reality, which is conducive to breaking away from the control fatigue of monetary policy and improving the effectiveness of macro-governance.

In addition, the empirical analysis of this paper also shows that the current quantitative monetary policy is still more effective than a price-oriented monetary policy in smoothing the economic cycle. Quantitative regulation has more neutral impact on the financial cycle, while price-oriented regulation will increase the volatility of price and financial cycles while smoothing the growth cycle. Few studies have been done before as to this respect. As early as 2012, the “12th Five-Year Plan for Financial Development and Reform” has put forward the idea of “boosting the transformation of monetary policy from quantity-oriented regulation to price-oriented regulation. However, due to the restriction of sound development of the financial market required by price-oriented regulation, China’s monetary policy is still in the transitional stage of the combination of quantitative and price-oriented regulation, and even more active quantitative regulation. This paper holds that for a long time to come, China’s monetary policy still needs to rely on quantitative regulation. On one hand, quantitative

regulation is still more effective than price-oriented regulation in stabilizing the real economy. On the other hand, price-oriented regulation has a significant non-neutral impact on financial volatility. In order to eliminate the additional financial effects, macro-prudential policies must be supplemented with price-oriented monetary policy regulation. The above analysis also demonstrates from a new perspective the necessity for China's monetary policy with domestic reforms (to be oriented from quantity to price) and external reforms (to build a dual-pillar regulatory framework) to advance side by side and complement with each other.

Notes

1. The 18 indicators are: budget deficit/industrial added value, REER year-on-year change rate, CPI year-on-year change rate, deposit and loan spreads, credit year-on-year growth rate, M2/savings deposit, RMB loan/savings deposit, creditor's rights/credit volume of monetary authorities to other deposit institutions, stock market value/industrial added value, market risk-free interest rate, stock index year-on-year change rate, premium/industrial added value, insurance company investment/insurance company assets, commodity housing price year-on-year change rate, OECD-CLI, Brent crude oil price year-on-year change rate and year-on-year change rate of real effective exchange rate of US dollar.
2. All the original data are processed by X12 season. Because the dimensions of the indicators are different, the formula $Y = X - \text{MIN} / (\text{MAX} - \text{MIN})$ is used to make the processing standardized.

References

- Borio, C. (2014), "The financial cycle and macroeconomics: what have we learnt?", *Journal of Banking & Finance*, Vol. 45 No. 8, pp. 182-198.
- Chuang, D. and Man, X. (2014), "Financial cycle fluctuation and its macroeconomic effect in china", *The Journal of Quantitative & Technical Economics*, Vol. 31 No. 9, pp. 75-91.
- Claessens, S., Kose, M.A. and Terrones, M.E. (2012), "How do business and financial cycles interact?", *Journal of International Economics*, Vol. 87 No. 1, pp. 178-190.
- Drehmann, M., Borio, C. and Tsatsaronis, K. (2012), "Characterising the financial cycle: don't lose sight of the medium term!", BIS working paper, Basel, pp. 380.
- Fangping, P. and Yujun, L. (2010), "The cost effect of China's monetary policy: evidence from companies", *Management World*, No. 12, pp. 27-33.
- Gang, Y. (2018), "Questions and answers to the sub-forum of the boao forum for Asia 2018", available at: www.pbc.gov.cn/goutongjiaoliu/113456/113469/3518129/index.html (accessed April 11).
- Ge, W. and Fei, L. (2016), "Research on China's monetary policy transition: exploration based on the mixed rules of quantity and price", *The Journal of World Economy*, Vol. 39 No. 3, pp. 3-25.
- Hai, J. and Zhuzhen, C. (2011), "Tight monetary policy shock, cost channel and inflation: evidence from china", *Journal of Financial Research*, No. 9, pp. 27-41.
- Issing, O. (2003), "Monetary and financial stability: is there a trade-off?", *BIS Papers*, No. 18, pp. 16-23.
- Levine, R., Loayza, N. and Beck, T. (2000), "Financial intermediation and growth: causality and causes", *Journal of Monetary Economics*, Vol. 1 No. 46, pp. 31-77.
- Schularick, M. and Taylor, A.M. (2009), "Credit booms gone bust: monetary policy, leverage cycles and financial crises, 1870-2008", NBER working paper, Cambridge.
- Schwartz, A.J. (1995), "Why financial stability depends on price stability", *Economic Affairs*, Vol. 15 No. 4, pp. 21-25.
- Trichet, J.C. (2005), "Asset price bubbles and monetary policy", Speech by President of the ECB, available at: www.ecb.europa.eu/press/key/date/2005/html/sp050608.en.html
- Xiaoyun, F., Mengyi, Y. and Licheng, X. (2017), "The financial cycle in China: theory, measurement, and analysis", *Studies of International Finance*, No. 1, pp. 28-38.

- Xu, Z. (2018), "Transition of China's monetary regulation in the stage of high-quality economic development", *Journal of Financial Research*, No. 4, pp. 1-19.
- Yinxing, H., Yang, G. and Xingfang, Q. (2005), *Modern Analysis of Capital*, Economic Science Press, Beijing.
- Yong, M., Xinyue, F. and Tuo, T. (2016), "Financial cycle and economic cycle: evidence from china", *Studies of International Finance*, No. 10, pp. 3-14.
- Yulu, C., Yong, M. and Zhuoyang, R. (2016), "How do financial cycles and volatility affect economic growth and financial stability?", *Journal of Financial Research*, No. 2, pp. 1-22.
- Yumei, G., Weize, C. and Yanbin, C. (2016), "The decreasing effectiveness of china's monetary policy and expectation management", *Economic Research Journal*, Vol. 51 No. 1, pp. 28-41.

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