



Recent macroeconomic stability in China [☆]



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ARTICLE INFO

Article history:

Received 30 August 2012

Received in revised form 18 July 2013

Accepted 18 July 2013

Available online 26 July 2013

JEL classification:

C33

E31

E32

J00

Keywords:

Great moderation

Output volatility

China

ABSTRACT

The volatility of Chinese GDP growth has been markedly lower since the mid-1990s. We utilize frequency domain and vector autoregression (VAR) methods to investigate the origin of the observed volatility reduction in the Chinese economy. Our estimation indicates that lower volatility of random shocks to the economy, or the good luck hypothesis, accounts for most of the decline in macroeconomic volatility. Although good policy and better business practices are also contributing factors, they play a marginal role in dampening China's economic fluctuations.

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1. Introduction

The striking reduction of output volatility in most industrial economies since the early 1980s, also known as the Great Moderation, has attracted extensive attention in recent years. Starting with the work of [McConnell, Mosser, and Quiros \(1999\)](#), a number of researchers investigate the sources of the sharp decline in macroeconomic volatilities. However, substantial disagreement on the origin of the Great Moderation continues. [Clarida, Gali, and Gertler \(2000\)](#) and [Boivin and Giannoni \(2006\)](#) claim that good policies, such as improved monetary policies, have tamed the business cycle. Meanwhile, [McConnell et al. \(1999\)](#) and [Kahn, McConnell, and Perez-Quiros \(2002\)](#) suggest that improved business cycle practices, such as inventory management and financial innovations,¹ account for a significant fraction of the reduction in output volatility. [Simon \(2000\)](#) and [Stock and Watson \(2002\)](#) argue that the decline in output volatility may simply reflect milder shocks impacting the economy. More recently, [Justiniano and Primiceri \(2008\)](#) show that investment-specific technology shocks account for most of the sharp decline in output volatility.

This sharp decline is not a phenomenon unique to western economies. Some studies note that China has also experienced a substantial reduction in output volatility since the mid-1990s ([Brandt & Zhu, 2000](#); [Du, He, & Rui, 2011](#); [He, Chong, & Shi, 2009](#); [Laurenceson & Rodgers, 2010](#)). However, so far little is known about the reasons behind China's economic moderation.

This paper adds to the existing literature by analyzing the time-varying volatility of the macroeconomic fluctuations in China, which is the largest emerging market economy and plays an increasingly important role in the world economy. The case of China

[☆] We would like to thank Tai-Leung Chong, Ying Fang and Cheryl Long for their helpful comments. Pak-Ho Leung provided excellent research assistance. Qing He is grateful for the support from the Program for New Century Excellent Talents in University (NCET-11-0495). Haiqiang Chen acknowledges the financial support from the National Nature Science Foundation of China grants 11201390, 71201137, 71131008 and 71271179.

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¹ [Dynan, Elmendorf, and Sichel \(2006\)](#) find evidence that financial innovation is a likely contributor to the mid-1980's stabilization.

is interesting for two reasons. First, different from western economies, China's moderation occurred with an exchange rate peg, capital control and financial repression. That western economies and China, with such diverse economic structures and macroeconomic environments, experienced a comparable volatility reduction provides an ideal venue for examining the driving force of this increasing macroeconomic stability.² Second, output volatility reduction is usually associated with relatively lower average growth rates of output in developed countries. China has experienced a substantial reduction in output volatility since the mid-1990s, but its economy has continued to grow rapidly. Over the past three decades, the growth rate has been, on average, about 10%, and has been much higher than that of all western countries. Studying Chinese macroeconomic volatilities can further clarify the relationship between economic growth and volatility.

To understand the driving force of recent Chinese macroeconomic moderation, we use the two-step strategy developed by Ahmed et al. (2004). In the first step, a spectrum analysis is employed to decompose the variances of macroeconomic variables by different frequency bands. The frequency domain method allows us to associate the volatility shifts with each possible moderation explanation.³ We then identify a variety of VAR models to complement the frequency domain analysis in the second step.⁴ The counterfactual analysis based on these VAR models allows us to determine whether the volatility reduction is due to changes in economic structure or changes in random shocks.

The main finding of this paper is that Chinese macroeconomic volatilities have experienced a substantial decline since the mid-1990s. In particular, we find that most reduction is due to milder shocks hitting the economy in the post-1994 period. Our results show that the post-1994 shift in spectrum is proportional across all frequencies for a wide range of macroeconomic variables, including the aggregated real GDP growth rate. Improvements in policy implementation and better business practices that may change the economy's response to shocks, rather than the exogenous shocks themselves, do not have a significant impact on volatility reduction. The estimates of the VAR analysis corroborate this finding. Although structural breaks in the coefficients across the two periods are found, supporting the importance of changes in the economic structure, the reduction in the innovation variance still plays a dominant role in driving output volatility.

Our results call into question the sustainability of the growth of the Chinese economy. Despite a remarkable economic growth performance over the last three decades, the Chinese economy still relies on a strategy of incremental reform and extensive growth,⁵ which renders it far from a market-oriented economy. As Prasad (2008) suggests, Chinese growth strategy has reduced the flexibility of the economy to withstand and recover against any large economic shock. Although the Chinese economy has maintained a high growth rate with low volatility, our results show that reduced random economic shocks, or just good luck, may account for much of the stability of the Chinese economy, while good policy and good business practices, which are more likely to provide ongoing economic stability,⁶ have only played minor roles in the decline in macroeconomic volatilities. Unfortunately good luck can become bad luck in the future. Reforms to improve policy effectiveness and business cycle practices are crucial for China to prepare for potential future economic shocks, and to maintain sustainable economic growth.

The paper is organized as follows. Section 2 presents evidence and possible explanations of the moderation of macroeconomic volatility in China. Section 3 describes our frequency domain analysis. A variety of VAR models are employed to address the source of the reduction in fluctuations in Section 4. Conclusions and policy discussions are given in Section 5.

2. Macroeconomic fluctuations and theoretical considerations

2.1. Volatility of the Chinese macro-economy

The most striking feature of the Chinese economy from the past three decades is its impressive growth during the reform period. Fluctuations in the Chinese macroeconomic variables reduced substantially from the mid-1990s (see Brandt & Zhu, 2000; Du et al., 2011; He, Hou, Wang, and Zhang, in press; He et al., 2009). To investigate how this moderation came about over the last three decades, we now review the patterns of key macroeconomic time series from the first quarter of 1979 to the fourth quarter of 2010. Our data are drawn from the CEIC database, except for the quarterly real GDP growth rate before 1994 which is obtained from Abeyasinghe and Rajaguru (2004). Our analysis is based on quarterly data after removing the trend and seasonal components.⁷ Specifically, real variables are transformed into growth rates (quarterly year-on-year growth rate), and prices are transformed

² Ahmed et al. (2004) report that the standard deviation of the GDP growth rate halved from the 1960–1983 period to the 1984–2002 period. Based on the Chinese data, we find that the standard deviation of the GDP growth rate is 4.02 between 1979 and 1994. After 1994, the standard deviation halves, falling to 1.96. See Table 1 for more detailed summary statistics.

³ Ahmed et al. (2004) show that the spectrum shift at the business-cycle frequency reflects changes in monetary policy while relevant changes in business practices are more likely to be associated with relatively high frequencies. Finally, shifts of innovation shock generate a proportional change in the spectrum at all frequencies.

⁴ Our estimation procedure closely follows the methodology of Ahmed et al. (2004). However, we include estimations of structural VAR models in addition to the reduced-form VAR analysis. We are indebted to one of the referees for making this point.

⁵ A growth pattern is characterized by using the expansion of inputs to promote economic growth. The popular view that China has followed an extensive growth model (for example, Wolf, 2011) has been challenged by the evidence of Zhu (2012), who shows that aggregate productivity growth has been the major driving force of China's growth since 1978. However, Zhu (2012) admits that many obstacles and distortions exist during China's economic reform, which may prevent productivity growth from being realized. Using firm-level data, Hsieh and Klenow (2009) show that total factor productivity gains about 30 to 50% if distortions in Chinese factor productivity are reduced to the U.S. level.

⁶ For example, the improvement of inventory management techniques may cause structural changes in production areas and permanently reduce their variability.

⁷ When quarterly data is unavailable, we used that of Chow and Lin (1971) for temporal disaggregation to transform each series from annual data into quarterly data.

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