Financial Risk Analysis on Its Impact on Regional Economic Growth in China

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Abstract. In the new economic normal, China is facing the challenge of economic transformation. One of the main focuses in current economic work is the prevention and control of systemic financial risks that may arise during this process. This study collected panel data from 31 provinces, municipalities, and autonomous regions in China between 2005 and 2017, and used a spatial Durbin model to investigate the impact of financial risks on provincial economic growth. The results indicate that financial risks can inhibit the economic growth of a local region, but promote the economic growth of neighboring regions. Furthermore, the urbanization rate and fixed asset investment share have a significantly positive effect on regional economic growth. The conclusion of this study provides some insights for policymakers who aim to achieve stable economic operation and prevent financial risks.

Keywords: financial risk · economic growth · provincial economy · spatial Durbin model

1 Introduction

In the current new normal economic situation, China's economy has started to show a trend of slowing growth. To deal with the problem of slowing economic growth, it is necessary to adjust the current economic structure on the one hand to adapt to the new economic situation and on the other hand to transform the way economic development is pursued in search of new growth points. However, during the economic transition period, there is a high incidence of risk. When risks accumulate to a certain degree, there is a possibility of transformation into systemic financial risks, which may even trigger a financial crisis and seriously damage the normal economic development order.

In the literature studying the impact of financial risks on economic growth, most empirical results indicate a negative impact of financial risks on economic growth. Huang et al. (2018) suggest that as the degree of financial risk increases, the economic growth effect of government debt will be weakened, and when the degree of financial risk exceeds the threshold variable of 3.902, the negative economic growth effect of government debt will be intensified. Yuan and Tong (2019) believe that financial risks may be transmitted from the household sector to the banking sector, thereby affecting the financial system

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and ultimately leading to the occurrence of financial crises, resulting in long-term economic decline. Li et al. (2018) suggest that financial fluctuations will have a negative impact on economic growth. Liu (2017) believes that when financial risks intensify, the probability of bad debt losses also increases. Moreover, financial risks will also damage the financing function of life insurance, thereby damaging the path of insurance-driven economic growth and causing negative impacts on economic growth. Miguel-Angel et al. found that when investor confidence is lacking, high risk will have a negative impact on the economy. However, some literature has reached different conclusions. Ding et al. (2014) suggest that in economically developed rural areas, the degree of financial risk is increased, which inhibits economic growth. In economically backward rural areas, financial risks have a positive impact on economic growth, but the impact is smaller than in developed areas.

In summary, it can be seen that scholars have different views on the relationship between financial risks and economic growth, and there are more literature on studying the relationship between financial risks and economic growth at the national macro level. For research on regional financial risks, most focus on studying the impact of financial risks within the region and do not fully consider the influence of spatial effects, thus ignoring the inter-regional correlation. This article aims to provide some theoretical basis for identifying the accumulated risks within the financial system, preventing and resolving financial risks as early as possible, and ensuring the smooth operation of the economy through studying the impact of financial risks on economic growth.

2 Analysis of the Influence Mechanism of Financial Risks on Economic Growth

Sustainable and coordinated economic development necessitates a favorable operating environment. Financial risks, which are ubiquitous and insidious, arise alongside financial activities. Failure to identify these risks in a timely manner leads to their accumulation, which has a considerable impact on the economy if sudden external changes occur. In such instances, people may develop pessimistic expectations about the economy's future, triggering panic and irrational economic behavior. Financial risks may then spread throughout the region, triggering a financial crisis that disrupts the financial system and ultimately harms economic growth. Financial risks not only impact a particular region but also follow a particular pathway to influence economic growth. Scholars such as Song et al. (2011) have confirmed that financial risks spread along departmental and sectoral pathways.

2.1 Variable Selection and Measurement

1. In this article, the dependent variable is economic growth (rjgdp), which is measured by per capita GDP or the growth rate of per capita GDP. Per capita GDP is used as the measuring indicator for the dependent variable in each region.
2. The independent variable in this article is the financial risk level (finrisk), which is measured by the non-performing loan ratio in each province and year. A higher non-performing loan ratio indicates a higher financial risk level in the region, which can negatively affect the flow of funds to the real economy.

3. To control for other factors that may affect economic growth, the following control variables are included in the model: degree of openness (open), human capital (hum), proportion of fixed asset investment (inv), and urbanization rate (urban). These variables are measured by the proportion of total import and export to GDP in each province, the average years of education in each region, the proportion of total investment in fixed assets to GDP in the whole society, and the proportion of urban population at the end of each year to the total population in each region, respectively. All variables in this article are processed by taking the natural logarithm.

3 Empirical Results and Analysis

3.1 Return Model Judgment and Selection

After calculating the global Moran's index, it has been established that spatial effects play a significant role in economic growth. If not accounted for, the use of a normal panel econometric model can result in biased parameter estimates. Therefore, this article employs a spatial econometric model with spatial effects to examine the influence of financial risk on economic growth. To identify the appropriate spatial econometric model for empirical analysis, an LM test is necessary. Table 1 presents the results of both the LM test and Hausman test.

Table 1 shows that both the LM-error and LM-lag statistics from the non-robust LM test are significant at the 1% level, indicating the presence of spatial effects in the model. However, it is impossible to decide whether to choose the spatial error model or the spatial lag model. Hence, a robust LM test is conducted. The results reveal that both the robust LM-error and LM-lag statistics are significant at the 1% level, but there is no clear direction. Based on the above tests, the present study uses the spatial Durbin model to investigate the spatial effects between financial risk and economic growth. Moreover, before conducting the regression analysis using panel models, it is crucial to perform the Hausman test to determine whether to select fixed effects or random effects. The regression results in Table 2 demonstrate that the Hausman test passes the significance test at the 1% level, rejecting the null hypothesis of selecting random effects. Therefore, the regression model employs fixed effects. To examine the relationship between various variables in the spatial dimension, the study selects the spatial Durbin model with fixed effects to investigate the impact of financial risks on economic growth. In summary, the spatial Durbin model utilized in this study is expressed in Eq. (1):

Table 1. Results of LM and Hausman tests.

Inspection	Statistics	Testing	Statistics
Moran's I	14.292***	LM-LAG	134.569***
LM-ERROR	180.106***	robust LM-LAG	10.477***
robust LM-ERROR	56.013***	Hausman tset	108.69***

$$\ln rjgdp_{it} = \rho \sum_{j=1}^{n} W_{ij} \ln rjgdp_{jt} + \beta_1 \ln finrisk_{it} + \theta_1 \sum_{i=1}^{n} W_{ij} \ln finrisk_{jt} + \beta_2 Z_{it} + \theta_2 \sum_{i=1}^{n} W_{ij} Z_{it} + \varepsilon_{it} \tag{1}$$

Among them, $\ln rjgdp_{it}$ represents the explained variable, i represents the province, t represents the time, and j represents neighboring provinces (j not equal to i).

$\ln finrisk_{it}$ is defined as the core explanatory variable, while Z_{it} serves as the control variable, encompassing elements such as openness rate, human capital, urbanization rate, and fixed asset investment ratio. Meanwhile, ρ indicates the spatial autocorrelation coefficient, β and θ represent the estimated parameters, and finally, ε_{it} denotes the random error term.

3.2 Model Estimation Results and Analysis

Firstly, regression analysis was conducted on the entire sample data based on spatial Durbin. Additionally, to explore the regional differences in the impact of financial risk

Table 2. Spatial Doberman Model Regression Results

	Full sample	Eastern	Central	West
Lnfinrisk	−0.045***	−0.073***	−0.062*	−0.039***
	(−5.35)	(−5.61)	(−1.69)	(−3.31)
Lnopen	0.005	−0.179***	0.054	0.017
	(0.39)	(−4.87)	(1.51)	(1.37)
Lnhum	0.239*	0.268*	0.407	−0.101
	(2.37)	(2.33)	(1.25)	(−0.77)
Lnurban	0.940***	0.918***	−0.125	1.533***
	(9.72)	(5.24)	(−0.35)	(9.59)
Lninv	0.097***	0.199***	0.021	−0.127**
	(3.88)	(6.43)	(0.39)	(−2.62)
W*Lnfinrisk	0.021*	0.033*	−0.003	−0.001
	(1.96)	(2.02)	(−0.10)	(−0.05)
W*Lnopen	0.033*	−0.050	−0.196***	0.021
	(1.83)	(−0.94)	(−5.51)	(1.19)
W*Lnhum	−0.036	0.270	1.350***	0.058
	(−0.22)	(1.46)	(3.72)	(0.36)
W*Lnurban	−0.073	0.267	0.890*	−0.390
	(−0.31)	(0.90)	(2.46)	(−1.41)
W*Lninv	−0.063	−0.227***	0.072	0.101

(*continued*)

Table 2. (*continued*)

	Full sample	Eastern	Central	West
	(−0.90)	(−3.70)	(1.29)	(1.01)
Rho	0.746***	0.585***	0.484***	0.692***
sigma2	0.004***	0.003***	0.004***	0.003***
R-square	0.7147	0.210	0.886	0.789
Log-likelihood	510.0076	208.105	131.913	221.960

on economic growth, the 31 provinces, cities, and autonomous regions were divided into three regions: eastern, central, and western, and respective studies were carried out. The regression results are presented in Table 2.

4 Conclusions

This article presents findings from a study that utilized panel data collected from 31 Chinese provinces and autonomous regions from 2005 to 2017. The study utilized a spatial Durbin model to investigate the relationship between financial risk and economic growth. The results showed that economic growth was not randomly distributed in space, but instead exhibited some degree of spatial spillover effect. The significance test for the Moran's I value for all years passed indicating a spatial clustering effect. The LM test further verified the spatial effect of economic growth. The study identified financial risk, urbanization rate, and proportion of fixed asset investment as significant factors affecting economic growth, when incorporating spatial effects. The overall regression results revealed that financial risk has a restraining effect on local economic growth and a stimulating effect on economic growth in neighboring areas. Moreover, urbanization rate exhibited a significant spatial spillover effect, while the proportion of fixed asset investment had a significant positive impact on economic growth in the region. To ensure stable economic growth, it is crucial to identify and control financial risks. In doing so, financial risks could also be leveraged as new opportunities for economic development. It is also important to emphasize the role of spatial factors in this context.

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