

The Impact of Financial Development on Unemployment: The Case of the People's Republic of China (PRC)

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Abstract

Research Originality: As a populous country with a population of 1.4 billion, China faces the imperative issue of employment. This paper focuses on the impact of financial credit and financial deposits on different levels of unemployment in an attempt to analyse the unemployment problem in China.

Research Objectives: The paper explores the impact of financial development on unemployment in China.

Research Methods: Using panel data from 31 provinces and cities in China (spanning from 2007 to 2021), categorizing unemployment situations, employing quantile regression models to assess the impact of financial development on different levels of unemployment in China.

Empirical Results: The findings indicate a negative correlation between financial development and unemployment levels in China. The study reveals that financial credit significantly impacts unemployment in provinces where the economy is higher than average GDP. However, in regions where the economy is lower than average GDP, the impact of financial deposits on unemployment is significant.

Implications: This study establishes that the adoption of financial expansionary policies by the government can reduce unemployment and help guide the formulation of more precise and effective economic policies.

Keywords:

financial development; unemployment; quantile regression; deposit; credit

How to Cite:

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INTRODUCTION

As a significant concern in both developed and emerging nations, unemployment results in economic and social challenges (Seth et al., 2018). Unemployment poses economic challenges by reducing income tax collection and productivity and causing several other issues (Adarkwa et al., 2017). Similarly, Al-Habees and Rumman (2012) argued that unemployment is a multi-faceted phenomenon, encompassing economic and social aspects. It manifests as fluctuations in economic activity and their influence on social structures as a social phenomenon. Unemployment varies based on a country's structure and the specific form of unemployment, which may lead to severe hardship and economic inefficiency resulting from a country's inability to employ its workforce (Baah-Boateng, 2016) efficiently. From another angle, Anghel et al. (2017) opined that unemployment, as a macroeconomic indicator, signifies a country's inefficiency in efficiently exploiting its abundant labor resources.

Currently, China's evolving employment structure has led to new challenges in the job market, impacting the workforce's supply and demand significantly. Colleges and universities are increasing admissions, leading to many graduates entering the job market annually, many of whom struggle to secure employment (Li et al., 2014). China's economic growth has resulted in cities accommodating more rural laborers, leading to a growing number of farmers opting to work in urban areas rather than on farms (Frijters et al., 2015). China's industry upgrades and restructuring have increased unemployment among middle-aged employees (Song et al., 2012). These three reasons will result in a rise in China's workforce. China is currently experiencing a crucial stage of economic development in relation to workforce demand. The market and government are working together to enhance economic development, leading to a phase of consistent economic growth. This condition implies diminishing the significance of economic growth in increasing employment. Therefore, how can China's labor market achieve steady and high-quality economic development while also increasing employment?

Past research has mostly focused on theoretical analyses indicating that higher levels of financial development stimulate job creation; however, empirical research is scarce on the impact of financial development on unemployment. Some researchers have examined the empirical link between financial advancement and firm dynamics (Arellano et al., 2012). Still, limited research has examined its effect on employment market dynamics. Some scholars argue that financial development promotes employment (Chen et al., 2021; Epstein et al., 2019; Pagano & Pica, 2012). However, the negative correlation between financial development and unemployment varies across countries, indicating a strong inverse relationship between these macroeconomic variables (Raifu et al., 2023).

The choice to study the impact of financial development on unemployment in China is due to the emerging importance of finance in the Chinese economy. There needs to be more previous research on this relationship, and this paper analyses it using different measures of financial development to explore findings that are more relevant to the Chinese context and to discover the mechanisms by which financial deposits and financial credit affect unemployment. In-depth analyses of these two indicators can

provide a more accurate understanding of the impact of different financial activities on unemployment and provide a basis for more precise policy formulation. Using a multi-indicator research methodology also allows for a more comprehensive assessment of the impact of China's financial development on unemployment, making the study's conclusions more in-depth and comprehensive.

By distinguishing between different levels of economic development, the paper reveals the different impacts of financial development on unemployment and provides meticulous data analyses and quantitative regression results. In addition, the paper uses quantile regression to explore the impact of different levels of unemployment in-depth, providing a new perspective for understanding the dynamics of China's economy and job market. Based on Okun's law, the present study focuses on the influence of financial advancement on the unemployment rate. Okun's law was proposed by American economist Arthur Okun and approximates the inverse correlation between the unemployment rate and real GDP. According to this law, a 2% decrease in real GDP growth relative to potential GDP growth increases the unemployment rate by about 1%. In comparison, a 2% increase in real GDP growth relative to potential GDP growth decreases the unemployment rate by about 1%.

Different scholars have different standards of measurement for the development of finances. King and Levine (1997) were pioneers in proposing using bank ratios as an indicator of financial growth, which laid the groundwork for the modern theory of financial development. Subsequently, Levine (1999) proposed that the best way to quantify financial sector growth is by assessing its capacity to analyze the financial system, identify successful businesses, regulate firms, handle risks, attract savings, and ease transactions. These definitions are important for the efficiency of financial institutions and stock markets. The present study provides an overview of financial development measurement based on the categorization of financial development measures by Valickova et al. (2015).

Economists have extensively studied the topic of unemployment. Addressing unemployment and boosting the employment rate is intricately linked to economic growth, social stability, and enhancing living standards. Scholars have emphasized macroeconomics as a significant issue. Levine (2012) emphasized that throughout economic growth, the path of production expansion depends on the combined growth rates of both labor supply and labor productivity. When real GDP growth exceeds the rise in labor productivity, employment increases; if job growth exceeds the expansion of the workforce, unemployment rates will decrease. Soylu et al. (2018) found that economic growth and unemployment are connected at the primary level of normalization, where economic growth impacts unemployment levels. Specifically, when GDP rises, unemployment falls.

The correlation between labor productivity increases and unemployment has been the subject of extensive theoretical and empirical discussions. Nevertheless, economists generally concur on the long-term positive impacts of labor productivity. Gallegati et al. (2014) found that productivity initially leads to short- and medium-term unemployment but eventually leads to increased employment. Similarly, Chen and Semmler (2018) used data from the United States to demonstrate that short-term productivity growth

might lead to higher unemployment. However, long-term productivity growth might be inversely related to unemployment. From another perspective, Wauthy and Zenou (2002) applied the classic theory of imperfectly competitive macroeconomics to show that the diversity of the labor force results in interconnected equilibrium wages, with each enterprise requiring its employees to cover training expenses. The lower the skills, the higher the training costs, and the harder it is to find a job. In this scenario, those with lower qualifications are at a higher risk of unemployment due to the excessive expenditures associated with their training. This situation also applies to the low-skilled workforce. Zeren (2019) found that technological progress does not reduce employment but creates new jobs and reduces unemployment. On the contrary, Casey (2018) and Md. Muinuddin et al. (2019) contended that technical advancements lead to higher long-term growth rates for salaries and output but also cause a rise in unemployment and a decrease in the percentage of labor income.

From a labor market perspective, the correlation between rural-urban migration and unemployment has attracted the attention of many economists. Todaro (1969) posited that labor migration occurs when workers anticipate higher pay in a different location. To establish a balance in employment between urban and rural regions, equalizing the anticipated earnings in both locations is essential. Similarly, Hussain et al. (2014) asserted that rural-urban migration is acknowledged as a major factor leading to a surplus workforce in urban areas. Unemployment in urban regions continues to rise due to the disparity in economic and structural development between urban and rural areas. Gorry (2013) examined the correlation between the minimum wage and unemployment and discovered that the minimum wage had a notable impact on increasing unemployment among young workers in France. Reducing or abolishing the minimum wage might lead to a decline in fresh unemployment in France.

On the contrary, Islam et al. (2017) discovered that implementing minimum wage legislation had a beneficial impact on decreasing unemployment in Malaysia. Kim and Lim (2018) found that although raising the minimum wage reduces labor demand, which increases the unemployment rate, it does not affect labor supply. Kilimova and Nishnianidze (2017) concurred with the notion that nations with higher levels of education tend to have lower rates of unemployment. This is because higher education workers receive more advanced training than secondary vocational education workers. The production process becomes more complex, and employers are more interested in higher-education individuals.

Enhancing financial resources may greatly enhance production and business circumstances for enterprises by providing credit access, which can encourage firms to generate additional job opportunities. Epstein et al. (2019) showed a significant negative link between financial development and unemployment volatility in developing nations through their study of the impact of financial expansion on labor market dynamics. Developed economies follow the opposite rationale. This is because input credit is less prevalent in developed economies than in developing ones. Raifu et al. (2023) discovered a significant negative impact of financial services development on unemployment across all

quantiles. Nevertheless, this impact decreases when one transitions from lower to higher quantiles. In a unidirectional manner, financial development is typically causally linked to unemployment, especially in the cases of adolescent, adult, and female unemployment. The causal relationship stems from economic growth and unemployment.

Some experts contend that financial growth exacerbates unemployment (Ibrahiem & Sameh, 2020; Shabbir et al., 2012). Shabbir et al. (2012) examined the correlation between unemployment and several indices of Pakistan's economic progress from 1973 to 2007, using autoregression with distributed lags, Granger integration, and causality tests. They found that most indicators exhibit a detrimental long-term influence on unemployment. Furthermore, advocates emphasizing the negative consequences of financial expansion on employment point to three ways it might harm employment. In other words, credit constraints cause decreased labor productivity, perhaps leading to employee layoffs (Dromel et al., 2010). Epstein et al. (2019) assert that heightened financial development results in a rise in investment prospects. Simultaneously, the number of non-performing assets is increasing, which might lead to a significant recession if a crisis occurs. Extending the recession period of the economic cycle leads to an increase in the length of unemployment, thereby causing a rise in the unemployment rate.

Ajide (2020) discovered a stable relationship between financial sector progress and unemployment based on the International Monetary Fund's new composite index of financial sector development. Positive variables have a more significant influence on unemployment than the adverse effects of financial development on unemployment. Chen et al. (2021) suggested that excessive financial development might hinder economic progress, particularly in nations with stringent labor market regulations. Financial systems that are highly dependent on the normal functioning of the financial sector, i.e., financial systems that are overly reliant on banks or lack market orientation, may impede investment and entrepreneurship, particularly in countries with flexible labor market regulations.

This study examines how the degree of financial development affects unemployment. The primary explanatory variables influencing unemployment are analyzed descriptively. An analysis is conducted using panel data from 31 Chinese provinces and cities over a fifteen-year period to categorize the provinces into economically developed and less developed regions based on GDP. This study then analyses how the level of financial development impacts unemployment in regions with varying economic development levels. This approach can help us better understand the mechanisms through which financial development affects unemployment across different economic levels.

The study examines how financial development influences unemployment in China. Economically developed regions may offer more job opportunities due to advanced financial systems, while underdeveloped regions face financial resource constraints. Comparing regions of varying economic levels helps understand financial development's impact on unemployment pathways. Quantile regression analysis is conducted on panel data to explore how financial development's influence varies across different unemployment levels. This approach enhances research accuracy by capturing unemployment complexity and diversity. Categorizing unemployment levels aids in formulating targeted policies to

address diverse unemployment situations effectively. This study offers insights for crafting and implementing employment policies in China.

METHODS

The statistics in the present study are sourced from the National Bureau of Statistics of China, a website that collects data from 31 provinces and cities in China, excluding Hong Kong, Macau, and Taiwan. This study examines the relationship between financial growth and unemployment in China using provincial-level data from 2007 to 2021. The data collected from 31 provinces and municipalities in China was separated into two categories based on the average GDP. The first category consists of provinces with GDP levels that are higher than the average, such as Beijing, Hebei, Shanghai, Jiangsu, Zhejiang, Anhui, Fujian, Shandong, Henan, Hubei, Hunan, Guangdong, and Sichuan. The second category consists of provinces with GDP below the average, such as Tianjin, Shanxi, Inner Mongolia, Liaoning, Jilin, Heilongjiang, Jiangxi, Guangxi, Hainan, Chongqing, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang.

The present study uses the quantity of unemployed individuals in the 31 provinces of China as a measure of the explanatory factors. Cross-country studies typically use the private sector loan-to-GDP ratio as a measure of financial progress (Ghirmay, 2004). There are no provincial-level substitutes available for China’s data. Thus, the present study utilises the following two indicators: Cre is the total credit to GDP ratio in the financial system, while Dep is the total deposits to GDP ratio in the financial system. These ratios indicate the disposable income for consumption and the liquidity crucial for firms’ survival (Li & Wye, 2023; Zhang et al., 2012).

Table 1. Variables Definition Summary

Types	Names	Symbols	Explanation
Dependent variable	Unemployment	U	the number of unemployed in each province of China
Control variables	Gross Domestic Product	GDP	the GDP of each province in China
	Birth Rate	BR	the birth rate by province in China
	Education	Edu	the government’s financial education expenditure for each province in China
Independent variables	Wage	W	the average wage of each province in China
	Deposits	Dep	the ratio of total deposits to GDP in China’s provincial financial systems
	Credits	Cre	the ratio of total credit to GDP in China’s provincial financial systems

The present study examines how financial development affects regions with varying degrees of economic development using a two-way fixed effects model to analyse two datasets. The study examines the relationship between financial development and unemployment across various economic conditions to see if the effect is positive or

negative. The data is thoroughly studied using the quantile model to see if the impact of financial growth on unemployment varies at different quantile levels.

This study utilises Stata to regress and evaluate the data. Outliers significantly impact the sum of squares of the residuals in the least squares model, leading to skewed regression results. The findings from this study use the Koenker and Bassett (1978) quantile regression model. Quantile regression is an extension of inverse mean regression that assesses the impact of explanatory factors on dependent variables at various quantile levels. Quantile regression has fewer stringent assumptions and is less affected by outliers with extreme values and heavy tails in the data distribution, which helps prevent biases. Quantile regression is known for its robustness and ability to evaluate data effectively, even in the presence of severe outliers (Galarza Morales et al., 2017; Nie et al., 2020; John, 2015). This study constructs a quantile regression model.

$$\ln U_{i,t}(\tau|x_{i,t}) = \beta_0 + \beta_1 \ln GDP_{i,t} + \beta_2 BR_{i,t} + \beta_3 \ln W_{i,t} + \beta_4 \ln Edu_{i,t} + \beta_5 \ln Dep_{i,t} + \beta_6 \ln Cre_{i,t} + \varepsilon$$

In this model, $\ln U$ is the dependent variable, which is calculated using the logarithm of the number of unemployed. $\ln U_{i,t}$ represents the logarithm of the amount of unemployment in province i in year t . τ is the τ th quantile. $\ln GDP_{i,t}$ is an independent variable that stands for the GDP of each province in China. $BR_{i,t}$ is another independent variable, signifying the birth rate for each province. $W_{i,t}$ is wage, which is measured by the average wage in this study. $\ln Edu_{i,t}$ is another independent variable for the government's financial education expenditure in each province. $\ln Dep_{i,t}$ and $\ln Cre_{i,t}$ are the independent variables for financial development.

RESULT AND DISCUSSION

This study explores the relationship between financial development and unemployment in China by employing a two-way fixed effects model and quantile regression analysis using provincial data from 2007 to 2021. The paper begins with descriptive statistics and correlation analyses. The regression analysis shows that financial development significantly negatively impacts unemployment. In particular, the ratio of deposit to GDP significantly affects the unemployment rate in highly developed and relatively underdeveloped regions. However, the impact of credit on unemployment is concentrated in provinces with above-average GDP.

Table 2. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
U	25.676	14.907	1	82.5
GDP	21423.161	20376.899	344.1	124719.5
BR	11.107	2.827	3.59	17.89
W	58823.882	29136.311	18144	194651
Edu	7958932.3	6350134.5	405548	44990678
Dep	1.849	0.723	0.848	5.233
Cre	1.399	0.491	0.55	2.996

p-values in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2 displays the descriptive statistics of the raw data used. The average GDP of provinces and municipalities is around 21423 billion Yuan. Provincial governments and cities had a birth rate of 11% and spent 7,958,932,000 Yuan on education, respectively. The average unemployment rate is 26 individuals, and the average salary is 58,823 Yuan, ranging from a high of 194,651 Yuan to a low of 18,144 Yuan. The table shows that the total deposits-to-GDP ratio in the financial sector is greater than the total credit-to-GDP ratio.

Table 3 presents the correlation coefficient analysis of the main independent variables and control variables in the sample data. The most significant finding is a strong negative association between the number of unemployed individuals (the dependent variable) and the extent of financial development (the primary independent variable) at a 1% significance level. This indicates a clear negative correlation, with many variables showing low correlation coefficients.

Table 3. Correlation coefficient

	lnU	lnGDP	BR	lnW	lnEdu	lnDep	lnCre
lnyU	1.000						
lnGDP	0.812***	1.000					
BR	-0.456***	-0.382***	1.000				
lnW	-0.051	0.364***	-0.218***	1.000			
lnEdu	0.663***	0.938***	-0.283***	0.557***	1.000		
lnDep	-0.362***	-0.102**	-0.233***	0.589***	0.037	1.000	
lnCre	-0.313***	0.020	-0.250***	0.705***	0.175***	0.780***	1.000

Three tests were conducted on the two sets of data to establish the efficiency specifications: the redundant fixed effects test, the Breusch-Pagan test, and the Hausman test. The results in Table 3 indicate that the null hypothesis for the redundant fixed effects test is rejected, suggesting the use of the fixed effects (FE) model; the null hypothesis for the Breusch-Pagan test is rejected, suggesting the use of random effects (RE); and the null hypothesis for the Hausman test is rejected, indicating the use of the fixed effects (FE) specification. The test results suggest that the FE model suits provinces with greater and lower GDP.

Table 4 shows a clear negative impact of GDP on unemployment in Chinese provinces and cities with GDP levels below the average, as shown in Model 2. Scholars have widely recognized the negative relationship between GDP and unemployment (Epstein et al., 2019). Model 1 does not show a statistically significant correlation between GDP and unemployment. In developed economies, input credit is less significant compared to developing economies, while the inverse is true for developing economies (Epstein & Shapiro, 2019). Both models show that the birth rate significantly impacts unemployment, indicating that as fertility rates rise, so does unemployment. According to Adsera (2005), increased unemployment may result from pregnant women leaving the job market as a result of higher fertility rates.

Table 4. Results of Panel Regression for Provinces with Above-Average GDP and Below-Average GDP

	Above-Average GDP	Below-Average GDP
	Model 1	Model 2
InGDP	-0.0042 (0.9891)	-0.3427* (0.0428)
BR	0.0489* (0.0420)	0.0311* (0.0456)
InW	0.6013 (0.2409)	-0.1445 (0.5268)
InEdu	-0.6877 (0.0700)	0.2663* (0.0499)
InDep	0.8268* (0.0183)	-0.7864*** (0.0009)
InCre	-0.4339* (0.0392)	0.0853 (0.5416)
_cons	7.1235 (0.2358)	3.2912 (0.1065)
N	169	232
adj. R ²	0.8823	0.9718
F-test	31.31***	26.20***
B-P	345.00***	275.68***
Hausman model	23.58*** FE	78.30*** FE

p-values in parentheses, * *p* < 0.05, ** *p* < 0.01, *** *p* < 0.001

Government financial funding for education in Model 2 has a statistically positive effect on unemployment in provinces with below-average GDP levels. This aligns with the concept that higher education levels are associated with higher unemployment rates in less economically developed regions, as proposed by Nepram et al. (2021). Having an education does not necessarily ensure employment. Additionally, the cause of the unemployment issue is not a lack of demand for workers but rather a mismatch between workers' abilities and the standards set by businesses (Binuomoyo, 2020). Model 1's findings indicate that government financial expenditure on education does not significantly affect unemployment. This discrepancy may be due to the distinct effects of formal schooling on unemployment. Factors such as educational attainment and certification can affect how education spending impacts unemployment rates (Riddell & Song, 2011).

Interestingly, the average income does not have a statistically significant impact on unemployment in both Models 1 and 2. This result suggests that wages do not significantly impact either encouraging or reducing unemployment. One possible explanation is that minimum wage increases have a minimal impact on employment levels (Totty, 2017).

Deposits to the GDP ratio significantly affect unemployment in both Models 1 and 2. This impact is beneficial in provinces with a GDP above average. This is because areas with more advanced financial development provide greater investment prospects.

Simultaneously, the number of non-performing assets is increasing, which might result in a significant economic downturn during a crisis. Prolonging a recession in the economic cycle leads to a rise in unemployment, causing an increase in the unemployment rate (Epstein et al., 2019). Credit constraints in financial markets worsen both the level and duration of unemployment (Dromel et al., 2010). Conversely, in areas with lower-than-average GDP, the impact of economic growth on unemployment is negative, aligning with Çiftçioğlu and Bein's (2017) findings. Financial system deposits, as part of financial depth, together with private sector lending and financial liquidity, have the potential to greatly decrease unemployment. Over time, banking system deposits have a negative and significant impact on the unemployment rate (Çiftçioğlu & Bein, 2017). As a result, in less developed economies, it is crucial to encourage financial growth by raising savings, underlining the importance of this endeavor.

The credit-to-GDP ratio has a significant adverse impact only on provinces with GDP levels above the average. Financial development facilitates increased credit accessibility and reduced loan expenses, enabling sovereign wealth funds to get credit and thus boost employment (Chen et al., 2021). Model 2 demonstrates no significant association between the loan-to-GDP ratio and the province's below-average GDP, aligning with Bayar's (2016) research findings. The financial sector benefits the actual economy once it reaches a certain level. During the first phases of economic development, the financial sector typically faces challenges in attracting enough money to generate and allocate sufficient capital for economic expansion. The lack of a link between financial development and unemployment may be attributed to an undeveloped financial sector.

Previous research on the varied impacts of financial expansion on unemployment in different economic regions of China has shown that deposits notably influence both highly advanced and relatively underdeveloped regions. The impact of deposits on unemployment is favorable in provinces with above-average GDP and negative in areas with below-average GDP. Credit only significantly impacts unemployment in provinces with GDP above the average. Quantile regressions on a panel of 31 provinces and cities in China will provide a more precise insight into the relationship between financial progress and unemployment in the country. The results indicate that financial development has a negative impact on unemployment.

A model is considered more robust when the majority of explanatory factors significantly impact the quality of employment across various quantile points, as seen in Table 5. The model coefficients for GDP show a substantial influence on unemployment in provinces with low unemployment levels, ranging from 25% to 90%, but not at the 10% quantile point. As unemployment levels rise in other provinces and cities, the influence of GDP on unemployment also grows, with GDP positively affecting unemployment. All five quantiles show negative regression coefficients for the birth rate, indicating that the birth rate has a detrimental impact on unemployment levels across China's labor market as a whole and in various quantiles. Varying regression coefficients across quantiles indicate that the impact of the birth rate on different degrees of unemployment is almost the same. At all five quantile points, the model coefficients show that the pay

level has a negative impact on the degree of unemployment. Wages have a diminishing impact on unemployment as the unemployment rate rises, unlike the birth rate. The regression coefficients for government financial investment in education are statistically significant and positive between the 10% and 50% quantiles. This result suggests that more government spending on education leads to higher unemployment rates, although the impact lessens as unemployment levels rise.

Table 5. Quantile Regression Results for Provincial Panel Data

	10%	25%	50%	75%	90%
lnGDP	0.0767 (0.4033)	0.2682** (0.0014)	0.4813*** (0.0000)	0.5737*** (0.0000)	0.6384*** (0.0000)
BR	-0.0845*** (0.0000)	-0.0763*** (0.0000)	-0.0825*** (0.0000)	-0.0903*** (0.0000)	-0.0871*** (0.0000)
lnW	-0.9460*** (0.0000)	-0.7759*** (0.0000)	-0.5098*** (0.0000)	-0.4745*** (0.0000)	-0.3738*** (0.0000)
lnEdu	0.7864*** (0.0000)	0.4614*** (0.0001)	0.1730** (0.0091)	0.0778 (0.3069)	0.0410 (0.7426)
lnDep	-0.5709*** (0.0000)	-0.5871*** (0.0021)	-0.2489 (0.0755)	-0.0119 (0.9342)	-0.2607 (0.2341)
lnCre	0.1053 (0.4410)	0.0755 (0.6141)	-0.2364** (0.0044)	-0.4151* (0.0132)	-0.2456 (0.1581)
_cons	1.1335 (0.3059)	2.6226** (0.0047)	2.3805*** (0.0000)	2.7840*** (0.0000)	1.8699 (0.0788)
N	401	401	401	401	401
adj. R ²	0.7150	0.6759	0.6339	0.5650	0.5297

p-values in parentheses

* *p* < 0.05, ** *p* < 0.01, *** *p* < 0.001

Deposits to GDP ratio exhibits negative regression coefficients between the 10% and 25% quantiles and has a significant negative impact on unemployment levels, consistent with prior empirical findings on the fixed impacts of provinces with below-average GDP. For instance, Raifu (2019) found that establishing a financial depth-unemployment model will increase the proportion of financial system deposits to GDP, both in the short and long term, and reduce the unemployment rate in Nigeria. Other studies have also confirmed the negative correlation between financial deposits and unemployment (Aleiro et al., 2013; Çiftçioğlu & Bein, 2017). Between the 50% and 90% quantiles, the ratio of deposits to GDP does not significantly impact unemployment levels. The correlation between deposits and GDP does not impact unemployment in regions with elevated unemployment rates.

Similarly, the correlation between loans and GDP significantly impacts unemployment only within the 50%–75% quantile, aligning with prior research showing two-way fixed effects for provinces with higher-than-average GDP. Credit growth can decrease unemployment and encourage employment in more economically developed areas.

Previous research has also demonstrated that increasing private-sector credit deposits can reduce the unemployment rate (Raifu, 2019; Pagano & Pica, 2012). Financial development generally reduces the unemployment rate in all provinces except the one with the highest unemployment rate.

The financial development indicators, in all models, align with the a priori expectation as propounded by Arthur Okun in 1962. The results indicate that an increase in financial deposits and credits can both reduce unemployment, as they reflect an increase in the financial system's supply of funds, which helps to stimulate economic activity and industrial development. This finding should instill a sense of optimism about the potential of financial systems in reducing unemployment. Firstly, the increase in financial deposits enhances the deposit base of financial institutions, enabling them to provide more loans to businesses and individuals. Businesses can utilize these funds to expand production, explore new markets, and create more job opportunities. Secondly, the increase in financial credits means more funds flowing into the real economy, encouraging investment and expansion by businesses, which also helps to increase employment opportunities. Therefore, whether it's the increase in financial deposits or credits, both provide essential financial support to the economy, driving employment growth.

CONCLUSION

This paper examines the relationship between financial growth and unemployment in China using provincial data from 2007 to 2021. Regression analyses show that financial development, particularly the ratio of deposits to GDP, significantly affects unemployment in highly developed and relatively less developed regions. However, the effect of credit on unemployment is mainly found in provinces with above-average GDP. Quantile regression analyses provide further insights into the nuanced relationship between financial development and unemployment at different quantile levels. The findings emphasize the importance of financial development in reducing unemployment, mainly through increased deposits and credit, thereby stimulating economic activity and job creation.

Building on the study's findings, this paper offers key implications for policymakers. Firstly, it underscores the need to continue prioritizing financial development initiatives, especially in regions with relatively underdeveloped economies. Enhancing access to financial services and bolstering financial infrastructure can significantly contribute to economic growth and unemployment reduction. Secondly, while government investment in education remains crucial for long-term economic development, policymakers should ensure that educational resources are effectively distributed to address skills gaps and enhance employment outcomes. The study also suggests that the employability of the labor force can be enhanced through targeted interventions that combine education programs with industry demand. Lastly, the study highlights the importance of implementing targeted policies to address regional disparities in economic development. By promoting inclusive growth and tackling structural barriers to employment, policymakers can create more equitable opportunities for all citizens.

While the present study provides valuable insights into financial development and unemployment reduction for the Chinese government, it is not without its limitations. The study categorizes the data into two groups based on GDP per capita: 13 provinces with above-average GDP and 18 provinces with below-average GDP. However, given the diverse economic levels across China's numerous provinces and cities, categorizing by average GDP may not fully capture the significant disparities in financial development. This could lead to variations in the impact of financial development on unemployment. If this assumption holds, a model representing the threshold impact of financial development in different provinces should be developed. However, this topic is beyond the scope of this paper and should be explored in future research. Additionally, due to data constraints, this study assesses financial development using the credit-to-GDP ratio and the deposit-to-GDP ratio. Future research could explore the use of these indicators when other suitable options are available.

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