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REGIONAL DISPARITIES IN FINANCIAL PROTECTION ACCESS IN INDONESIA: A PANEL AND SPATIAL ANALYSIS

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Abstract: Financial protection is essential for enhancing household resilience against economic and health shocks. However, evidence on regional disparities integrating financial inclusion and social health protection remains limited in developing countries such as Indonesia. This study addresses this gap by examining spatial–temporal disparities in financial protection across provinces and identifying their socioeconomic drivers. Using panel data from 34 Indonesian provinces (2019–2024), this study constructs a Financial Protection Index (FPI) based on insurance density and BPJS Kesehatan participation using min–max normalization. The analysis employs Global Moran's I, LISA, and panel regression. The results reveal persistent disparities, with higher financial protection concentrated in more developed provinces. While no significant global spatial autocorrelation is observed, LISA identifies clusters of lagging regions requiring targeted intervention. Human development and income have a positive effect on financial protection, while inequality has a negative effect. Poverty shows a positive association, reflecting the expansion of public health insurance. This study contributes by integrating public and private dimensions of financial protection and applying a combined spatial–panel approach. The findings highlight the need for targeted policies to reduce regional gaps by strengthening the synergy between BPJS Kesehatan and financial inclusion initiatives.

Keywords: Financial Inclusion, Financial Protection, Panel Data Analysis, Regional Disparities, Spatial Analysis.

INTRODUCTION

Financial protection is a fundamental component of economic resilience, as it enables households to mitigate the adverse impacts of health shocks and other unexpected risks. In developing countries, limited access to financial protection mechanisms such as insurance and social security often increases household vulnerability and may lead to financial distress or poverty. Despite the growing importance of financial protection, insurance penetration in Indonesia remains structurally low and significantly lags behind regional peers. Data from Otoritas Jasa Keuangan indicate that insurance penetration in Indonesia is only around 1.4% of GDP, reflecting limited utilization of insurance as a formal risk management instrument. In contrast, neighbouring countries demonstrate substantially higher levels of penetration, such as Malaysia at approximately 3.8% and Singapore at above 12%, indicating a more mature and deeply integrated insurance market (Otoritas Jasa Keuangan, 2023a).

This disparity highlights a structural gap in financial protection across income groups and economic systems. In Indonesia, insurance is often perceived as a non-essential or tertiary financial product, particularly among lower-income households, who tend to prioritize immediate consumption needs over long-term risk mitigation (Hasanah et al., 2024). As a result, financial vulnerability remains

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highly asymmetric: economically disadvantaged groups face a higher probability of falling into deeper poverty when exposed to shocks (Pandey and Ara, 2025), while middle- and high-income groups are relatively better protected through access to insurance mechanisms (Jameaba, 2021). The persistence of low penetration (remaining below 3% over the past decade) further underscores systemic challenges in financial literacy, accessibility, and affordability within the insurance market (Ronaldo et al., 2024). Global evidence highlights that financial inclusion and risk protection contribute significantly to resilience and inclusive growth, particularly in the context of economic uncertainty (Asian Development Bank, 2023; World Bank, 2022).

In Indonesia, health insurance services contribute to reducing economic inequality by enhancing financial protection against health risks. However, national-level indicators often fail to capture disparities across regions. As an archipelagic country with diverse economic structures, Indonesia exhibits significant regional heterogeneity in income levels, human development, and access to financial services. These disparities are likely to influence access to financial protection across provinces. Previous reports also indicate that national statistics tend to focus on general welfare indicators without explicitly incorporating financial protection dimensions (Badan Pusat Statistik, 2024; Otoritas Jasa Keuangan, 2023b).

Financial protection is closely related to financial inclusion, particularly in terms of access to and utilization of formal financial services for risk management. In this study, financial protection is reflected through insurance penetration and participation in public health coverage.

From a theoretical perspective, financial protection is influenced by socioeconomic conditions (Liu et al., 2025). Higher human development and income levels are expected to improve access to financial protection by increasing financial capacity and awareness. In contrast, income inequality may limit equitable access, while poverty may be associated with greater reliance on public protection schemes. Empirical studies also show that financial inclusion is linked to economic growth, poverty reduction, and inequality dynamics across regions (Fakhrulrizqi and Nuraulia, 2025; Sahran et al., 2024).

Despite its importance, empirical studies that integrate multiple dimensions of financial protection, such as insurance density and public health coverage (JKN), remain limited in the Indonesian context. Most existing studies tend to examine health or economic disparities separately, often at the national or cross-sectional level, thereby overlooking regional disparities and spatial heterogeneity. For instance, Lania et al. (2025) analyzed interprovincial economic disparities using panel data, while Salsabillah and Fitanto (2024) examined the determinants of regional disparities in Eastern Indonesia using a panel regression approach. In the health context, Rohmah (2023) explored disparities in healthcare access and outcomes. However, these studies do not integrate multiple dimensions of financial protection into a unified analytical framework. Understanding these disparities is essential for designing effective and targeted policies, particularly in the context of Indonesia's archipelagic and heterogeneous regional structure. In this regard, spatial and panel data approaches can be used to capture regional patterns and

dynamic relationships in financial protection. Despite the growing attention to financial inclusion and regional inequality, studies that explicitly examine financial protection as a multidimensional concept remain limited.

This study aims to address these gaps by developing a novel Financial Protection Index at the provincial level in Indonesia and analysing regional disparities in financial protection access. To the best of our knowledge, this study is among the first to integrate insurance indicators and public health coverage into a unified measure of financial protection in the Indonesian context.

The study further examines spatial patterns and investigates the influence of key socioeconomic factors, including income level, human development, income inequality, and poverty. By integrating panel data and spatial analysis, this research offers an integrated analytical framework for understanding regional disparities in financial protection.

This study contributes to the literature in two ways. First, it provides empirical evidence on the multidimensional nature of financial protection by combining insurance and public health indicators at the regional level. Second, it highlights the role of socioeconomic and spatial factors in shaping disparities, offering insights that are relevant for designing more targeted and region-specific policy interventions.

LITERATURE REVIEW

Financial protection is a key dimension of economic welfare, particularly in developing countries where households are highly vulnerable to health and economic shocks. According to the World Bank (2022), financial inclusion, including access to insurance and social protection mechanisms, plays a critical role in enhancing resilience and reducing vulnerability. Similarly, the Asian Development Bank (2023) emphasizes that financial resilience is closely linked to inclusive financial systems that provide adequate risk protection. In this study, financial protection is typically proxied by indicators such as insurance coverage and participation in public health programs. In this study, these dimensions are combined into a composite measure to capture variations across regions.

The concept of financial protection is closely related to financial inclusion but extends beyond access to financial services. Financial inclusion and financial protection are closely related, as both concern access to and effective use of financial services for managing risks. In the Indonesian context, financial protection is reflected in the expansion of insurance services and the implementation of the National Health Insurance program, although disparities in access remain a major concern (Badan Pusat Statistik, 2024; Otoritas Jasa Keuangan, 2023b).

Building on this perspective, this study focuses on financial protection as a measurable outcome of access to risk management mechanisms, particularly through insurance and public health coverage, and examines its variation across regions.

Empirical studies have shown that financial inclusion and protection are closely linked to economic growth, inequality, and poverty. Fakhrulrizqi and Nuraulia (2025) find that financial inclusion has a significant impact on economic growth and income distribution across provinces in Indonesia, particularly when spatial factors are considered. Similarly, Sahran et al. (2024) demonstrate that financial inclusion contributes to reducing income inequality,

although the effects may vary across regions. These findings suggest that access to financial services and protection mechanisms is not evenly distributed and is influenced by regional socioeconomic conditions. However, existing studies generally examine financial inclusion or economic inequality separately, without explicitly capturing financial protection as a multidimensional concept that integrates both insurance and public health coverage. This gap limits the understanding of how different dimensions of risk protection interact across regions.

From a theoretical perspective, economic development and human capital are expected to positively influence financial protection. Regions with higher income levels and better human development indicators tend to have greater access to financial services, including insurance products. Conversely, income inequality may limit access to financial protection, as lower-income groups often face barriers in accessing formal financial instruments. This relationship highlights the importance of examining financial protection within a broader framework of regional economic disparities.

Despite the growing body of literature on financial inclusion, studies that specifically focus on financial protection and integrate multiple dimensions, such as insurance and public health coverage, remain limited. In the Indonesian context, existing studies tend to examine economic or health disparities separately. For example, Lania et al., (2025) analyzed interprovincial economic disparities using panel data, while Salsabillah and Fitanto (2024) examined the determinants of regional disparities in Eastern Indonesia. In the health context, Rohmah (2023) explored disparities in healthcare access and outcomes. However, these studies do not integrate multiple dimensions of financial protection into a unified analytical framework. Moreover, most existing studies rely on national-level analysis, which may overlook significant regional disparities and spatial heterogeneity. Spatial approaches have been increasingly used to analyze regional phenomena, as they allow for the identification of clustering patterns and spatial dependencies across regions. For instance, previous studies applying spatial methods in Indonesia demonstrate that regional characteristics and geographic proximity can influence the distribution of socioeconomic indicators (Novika and Kusdani, 2025).

Based on the existing literature, it can be argued that financial protection is shaped by a combination of economic, social, and spatial factors. However, existing studies rarely integrate multidimensional measures of financial protection with both panel and spatial analytical approaches at the regional level. This study addresses this gap by developing a composite Financial Protection Index that integrates insurance indicators and public health coverage, and by analysing its regional disparities using a combined panel and spatial framework.

This integrated approach provides a more comprehensive understanding of financial protection by capturing both temporal dynamics and spatial patterns, offering insights that are not captured in studies relying on single-method or single-dimension analyses.

RESEARCH METHODS

This study uses panel data covering 34 Indonesian provinces over the period 2019–2024. The data are obtained from official sources, including Otoritas Jasa Keuangan (OJK), BPJS Kesehatan, and Badan Pusat Statistik (BPS). The dataset combines cross-sectional and time-series dimensions, allowing the analysis to capture both regional variation and temporal dynamics.

The dependent variable is financial protection, measured using a composite Financial Protection Index (FPI). The index is constructed from two indicators: insurance density and participation in the National Health Insurance (JKN) program. To ensure comparability across provinces, each indicator is normalized using min–max transformation (Greco et al., 2016):

$$X' = (X - X_{min})/(X_{max} - X_{min})$$

The normalized indicators are then aggregated using a simple average approach to construct the Financial Protection Index. The aggregation of indicators into a composite index requires methodological justification to ensure validity and interpretability. In this study, equal weighting is applied, assuming that each dimension contributes equally to financial protection. This approach is consistent with the guidelines for composite index construction proposed by the OECD (2008), particularly when there is no strong theoretical or empirical basis for assigning differential weights (Joint Research Centre, 2008). Furthermore, the use of equal weighting enhances transparency and avoids introducing subjective bias in the index construction. Alternative methods, such as principal component analysis (PCA), were not employed due to the limited number of indicators and the study's emphasis on interpretability rather than dimensional reduction. The resulting index ranges from 0 to 1, where higher values indicate better financial protection.

In addition to the dependent variable, several independent variables are included to explain variations in financial protection across regions. These variables consist of the Human Development Index, gross regional domestic product per capita (in logarithmic form), income inequality as measured by the Gini ratio, and the poverty rate. These variables are selected based on their theoretical relevance to financial protection and regional economic disparities (Fakhrulrizqi and Nuraulia, 2025; Sahran et al., 2024).

Data collection is conducted through documentation of secondary data published by the respective institutions. The study applies a census approach, as all provinces in Indonesia are included in the analysis, eliminating the need for sampling techniques. Data processing involves data cleaning, transformation, and validation to ensure consistency and reliability across different data sources. In addition, data harmonization was performed to ensure comparability across provinces and time periods. This includes aligning data definitions and addressing missing values through appropriate imputation techniques. These steps are essential to minimize bias and improve the robustness of the analysis.

To analyze regional disparities, descriptive statistics and the coefficient of variation are employed to measure the degree of inequality in financial protection across provinces (OECD, 2008). Furthermore, spatial analysis is conducted using Global Moran's I to identify the presence of spatial autocorrelation, as well as Local Indicators of Spatial Association (LISA) to detect local clustering patterns (Anselin, 1995). These methods allow for

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the identification of regions with similar levels of financial protection and the detection of spatial dependence across provinces.

To examine the determinants of financial protection, panel data regression analysis is applied using the following general model:

$$FPI_{it} = \beta_0 + \beta_1 HDI_{it} + \beta_2 \ln GRDP_{it} + \beta_3 Gini_{it} + \beta_4 Poverty_{it} + \varepsilon_{it}$$

Model selection is conducted using the Hausman test to determine the most appropriate model among pooled, fixed effects, and random effects specifications. (Hausman, 2015). In cases where heteroskedasticity is detected, robust standard errors are employed to ensure the reliability of the estimation results. Through the integration of panel and spatial analysis, this study provides a comprehensive framework for understanding regional disparities in financial protection in Indonesia.

RESULTS AND DISCUSSION

The results indicate that financial protection in Indonesia has experienced an upward trend during the period 2019–2024. The average Financial Protection Index (FPI) increased from approximately 0.10 in 2020 to around 0.30 in 2024, suggesting an overall improvement in access to financial protection mechanisms across provinces. This trend may reflect the expansion of financial inclusion policies and the increasing coverage of the National Health Insurance program.

However, this improvement should be interpreted with caution. First, the increase in the index may be driven largely by the expansion of public health insurance rather than a balanced development of financial protection mechanisms, particularly private insurance. Second, the observed trend does not necessarily imply improved financial resilience at the household level, as the index does not capture aspects such as benefit adequacy or out-of-pocket expenditures. Third, variations across provinces remain substantial, indicating that national-level improvements may mask persistent regional disparities.

These findings suggest that while financial protection appears to improve over time, the progress may be uneven and potentially driven by specific policy components, highlighting the need for a more nuanced interpretation of the results.

Beyond the observed upward trend, it is important to note that the improvement in financial protection does not necessarily reflect uniform progress across all regions. The variation in provincial performance suggests that structural differences, such as institutional capacity and financial service accessibility, continue to shape the distribution of financial protection. This indicates that national-level improvements may mask persistent regional inequalities.

The descriptive statistics further confirm the presence of inequality in financial protection. As presented in Table 1, the average FPI is 0.295, with a minimum value of 0.0526 and a maximum value of 0.926. The relatively high standard deviation of 0.175 and a coefficient of variation of 0.593 indicate substantial disparities across provinces. These results suggest that although financial protection has improved overall, its distribution remains highly uneven, with some provinces experiencing significantly better access than others.

The observed variation in financial protection across provinces suggests that disparities are not solely driven by economic factors. However, this interpretation should

be approached with caution, as the model does not explicitly capture other potentially relevant factors such as financial literacy, awareness of insurance products, or access to financial institutions. Previous studies have shown that financial literacy and access to financial services play an important role in shaping financial inclusion and protection outcomes (OECD, 2008; World Bank, 2022). These factors may contribute to the differences observed across provinces, although they are not directly examined in this study. This finding is also consistent with previous evidence indicating that regional inequality remains a persistent issue in Indonesia (Lania et al., 2025).

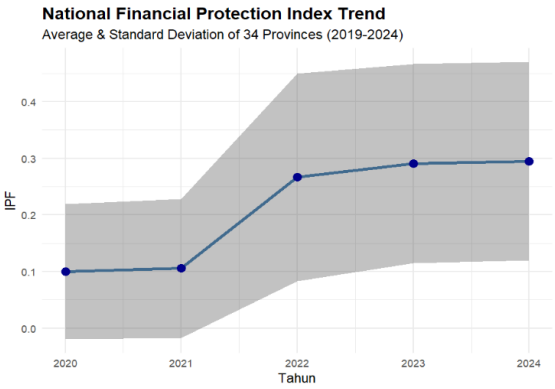


Figure 1. Trend of Financial Protection Index (FPI) in Indonesia, 2019–2024
Source: Processed data (2026)

Table 1. Descriptive Statistics of Financial Protection Index (FPI) in Indonesia

Statistic	Value
Mean	0.295
Minimum	0.0526
Maximum	0.926
Standard Deviation	0.175
Coefficient of Variation	0.593

Source: Processed data (2026)

In addition, the high variation in financial protection across provinces may also indicate unequal distribution of financial infrastructure and institutional capacity. Regions with limited access to banking services, insurance providers, and digital financial platforms are more likely to experience lower levels of financial protection. This suggests the importance of not only economic growth but also the expansion of financial service infrastructure and accessibility in improving financial protection.

This level of variation indicates that disparities are not only statistically significant but also economically meaningful across provinces. These findings confirm that financial protection is unevenly distributed, with substantial differences in access across regions.

This uneven distribution is further reflected in the spatial pattern of financial protection**.** As illustrated in Figure 2, provinces with higher FPI values tend to be concentrated in specific areas, while several regions still exhibit low levels of financial protection. This pattern reflects differences in regional economic development, infrastructure availability, and access to financial services. Provinces with stronger economic performance and better

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institutional support generally achieve higher levels of financial protection compared to less developed regions. This finding is consistent with previous studies that emphasize the role of regional economic capacity in shaping inequality outcomes (Salsabillah and Fitanto, 2024).



Figure 2. Spatial Distribution of Financial Protection Index (FPI) Across Provinces in Indonesia
Source: Processed data (2026)

Further analysis identifies several provinces that fall into the priority category, characterized by low financial protection and high inequality, including Nusa Tenggara Barat, Jawa Barat, Jawa Tengah, Bengkulu, Jawa Timur, and Banten. Rather than being concentrated only in geographically remote areas, these provinces include both less-developed regions and economically significant provinces, particularly in Java.

This pattern suggests that disparities in financial protection are not solely associated with geographic isolation, but also reflect structural challenges within densely populated and economically active regions. In particular, provinces with large populations and high economic activity may still experience unequal access to financial services across different population groups, resulting in persistent inequality in financial protection.

This finding highlights that improving financial protection requires not only expanding access in remote areas but also addressing intra-regional inequality in more developed provinces. In line with Rohmah (2023), disparities in access to health-related services remain a key contributor to inequality in welfare outcomes.

The spatial analysis using Local Indicators of Spatial Association (LISA) provides additional insights into the clustering patterns of financial protection. The results indicate that most provinces do not form statistically significant clusters, suggesting that spatial dependence is relatively weak. However, several provinces exhibit low–high patterns, indicating that regions with low financial protection are surrounded by neighboring provinces with relatively higher levels.

This pattern reflects spatial imbalance and suggests that policy interventions in one region may not automatically generate spillover effects in adjacent areas. The absence of strong spatial clustering further indicates that disparities in financial protection are more influenced by internal regional characteristics, such as institutional capacity and socioeconomic conditions, rather than geographic proximity. Therefore, these findings highlight the importance of localized and region-specific policy interventions, which are often overlooked in studies focusing solely on national-level analysis.

The panel data regression analysis further explains the determinants of financial protection across provinces. Based on the Hausman test results (Table 3), the fixed effects model is selected as the most appropriate model, as indicated by a statistically significant p-value.

Table 2. Priority Provinces Based on Financial Protection and Inequality

Province	FPI	Gini	Quadrant
West Nusa Tenggara	0.119487	0.3625	Priority (Low Protection + High Inequality)
West Java	0.169822	0.4245	Priority (Low Protection + High Inequality)
Central Java	0.175681	0.3655	Priority (Low Protection + High Inequality)
Bengkulu	0.189494	0.3425	Priority (Low Protection + High Inequality)
East Java	0.215114	0.3725	Priority (Low Protection + High Inequality)
Banten	0.227305	0.356	Priority (Low Protection + High Inequality)

Source: Processed data (2026)

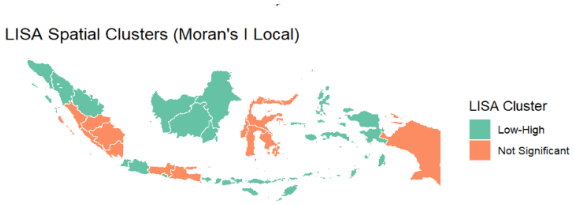


Figure 3. LISA Cluster Map of Financial Protection Index (FPI) in Indonesia
Source: Processed data (2026)

Table 3. Hausman Test Results for Model Selection

Statistic	Value
Chi-square	42.779
df	4
p-value	1.15e-08

Source: Processed data (2026)

Table 4. Panel Regression Results of Financial Protection Determinants

Variable	Fixed Effects
Human Development Index (HDI)	0.016
GRDP (log)	0.486
Gini Ratio	-0.965
Poverty Rate	0.009

Source: Processed data (2026)

The estimation results presented in Table 4 indicate that human development and income level positively influence financial protection through improved financial capacity, literacy, and access to financial services. This suggests that improvements in human development may enhance financial protection indirectly through better education and awareness. In contrast, income inequality has a negative effect, reflecting unequal access to financial protection mechanisms across population groups. The positive relationship between poverty and financial protection highlights the role of government intervention, particularly through public health insurance programs, in expanding coverage among lower-income populations. However, this also indicates a continued reliance on public schemes, suggesting that access to private financial protection remains limited in these groups.

Overall, the findings suggest that financial protection is shaped by a combination of economic and social factors. While economic capacity improves access, disparities persist due to unequal distribution of resources and access to financial services. This result is consistent with previous studies emphasizing the role of financial inclusion and economic development in shaping welfare outcomes (Fakhrulrizqi and Nuraulia, 2025; Sahran et al., 2024).

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Furthermore, this study extends the literature by incorporating a spatial perspective, showing that disparities in financial protection are not only driven by socioeconomic factors but also exhibit regional patterns across provinces.

These findings highlight the importance of considering regional heterogeneity, particularly in provinces with lower levels of financial protection and higher inequality, as addressing these disparities is essential for achieving more inclusive outcomes.

These results indicate that financial protection is not determined by a single factor, but rather by the interaction between economic capacity, inequality, and public intervention. For instance, regions with higher income levels but persistent inequality may still experience limited access among certain population groups. Similarly, the positive role of poverty reflects the importance of public health insurance, but also highlights the limited penetration of private financial protection. This suggests that financial protection outcomes are shaped by both market-based mechanisms and government interventions, which may operate differently across regions.

CONCLUSION AND SUGGESTION

This study concludes that financial protection in Indonesia has improved over time but remains unevenly distributed across provinces. Empirically, the Financial Protection Index (FPI) increased from approximately 0.10 in 2020 to around 0.30 in 2024, indicating a general upward trend. However, substantial disparities persist, as reflected by a high coefficient of variation (0.593), suggesting uneven distribution across regions.

The regression results further show that Human Development Index and income level have positive effects on financial protection, while income inequality has a negative effect, indicating that disparities are closely linked to socioeconomic conditions. In contrast, the positive association between poverty and financial protection reflects the role of public health insurance in expanding coverage among lower-income populations.

Overall, these results indicate that disparities in financial protection are shaped by a combination of economic, social, and institutional factors, and that improvements at the national level have not been evenly distributed. This is further reflected in the identification of priority regions, such as Nusa Tenggara Barat, Jawa Barat, Jawa Tengah, Bengkulu, Jawa Timur, and Banten, which exhibit low financial protection alongside relatively high inequality.

These findings suggest that efforts to improve financial protection need to account for regional differences, particularly in provinces characterized by low index values and higher inequality, as targeted approaches may be more effective in reducing disparities.

Strengthening financial inclusion programs, expanding insurance coverage, and enhancing the effectiveness of social protection systems are important to ensure more equitable access. In addition, policymakers should consider regional characteristics and spatial disparities when designing interventions, particularly in provinces identified as having low financial protection and high inequality.

Improving access to financial services and increasing the capacity of individuals to participate in financial protection mechanisms, especially in regions with lower human development and income

levels, may play a key role in reducing disparities.

Furthermore, this study underscores the importance of balancing public and private roles in the provision of financial protection. While public programs such as national health insurance have successfully expanded coverage, the development of inclusive and accessible private financial products remains necessary to achieve a more sustainable and comprehensive financial protection system.

Despite its contributions, this study has several limitations. The Financial Protection Index is constructed using limited indicators and may not fully capture all dimensions of financial protection, such as informal risk-sharing mechanisms or variations in private insurance products. In addition, the use of provincial-level data may overlook disparities at more granular levels, such as districts or households, which could provide a more detailed understanding of inequality.

Future research may focus on improving the measurement of financial protection by incorporating more comprehensive indicators, including aspects of financial access and behavior that are not captured in this study. In addition, the use of advanced spatial econometric models could provide deeper insights into regional dependencies and spatial interactions across provinces.

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