

Mapping Municipal Debt Risks: A Spatiotemporal Analysis of China's Prefecture-Level Cities

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Abstract

Addressing the risks associated with local government debt is crucial for economic development and fiscal security. This paper analyzes the spatiotemporal distribution of municipal government debt risks using panel data from 271 prefecture-level cities in China from 2015 to 2021, employing Exploratory Spatial Data Analysis (ESDA) and the Spatial Durbin Model. The prime objective of this research is to analyze the spatiotemporal distribution of municipal government debt in different regions of China, including the central, western, eastern regions. Key findings include: (1) Local government debt risk exhibits a fluctuating upward trend characterized by significant regional, administrative, and debt-type disparities. (2) Risk levels in central and western regions have increased, while major urban agglomerations have maintained medium or lower risk levels. (3) Local government debt risk demonstrates significant global spatial correlation, with low-low (LL) agglomerations evolving from multi-centered to dual-centered distributions. (4) Notably, a 1% increase in neighboring debt risk leads to a 0.2467% rise in local debt risk. (5) Fiscal pressure, urbanization rates, and economic scale are primary drivers of local government debt risk, whereas industrial structure, land transfer income, and financial development serve to mitigate it. These findings underscore the intra-regional and inter-regional heterogeneity and geographical differences, providing valuable insights for managing municipal government debt risk.

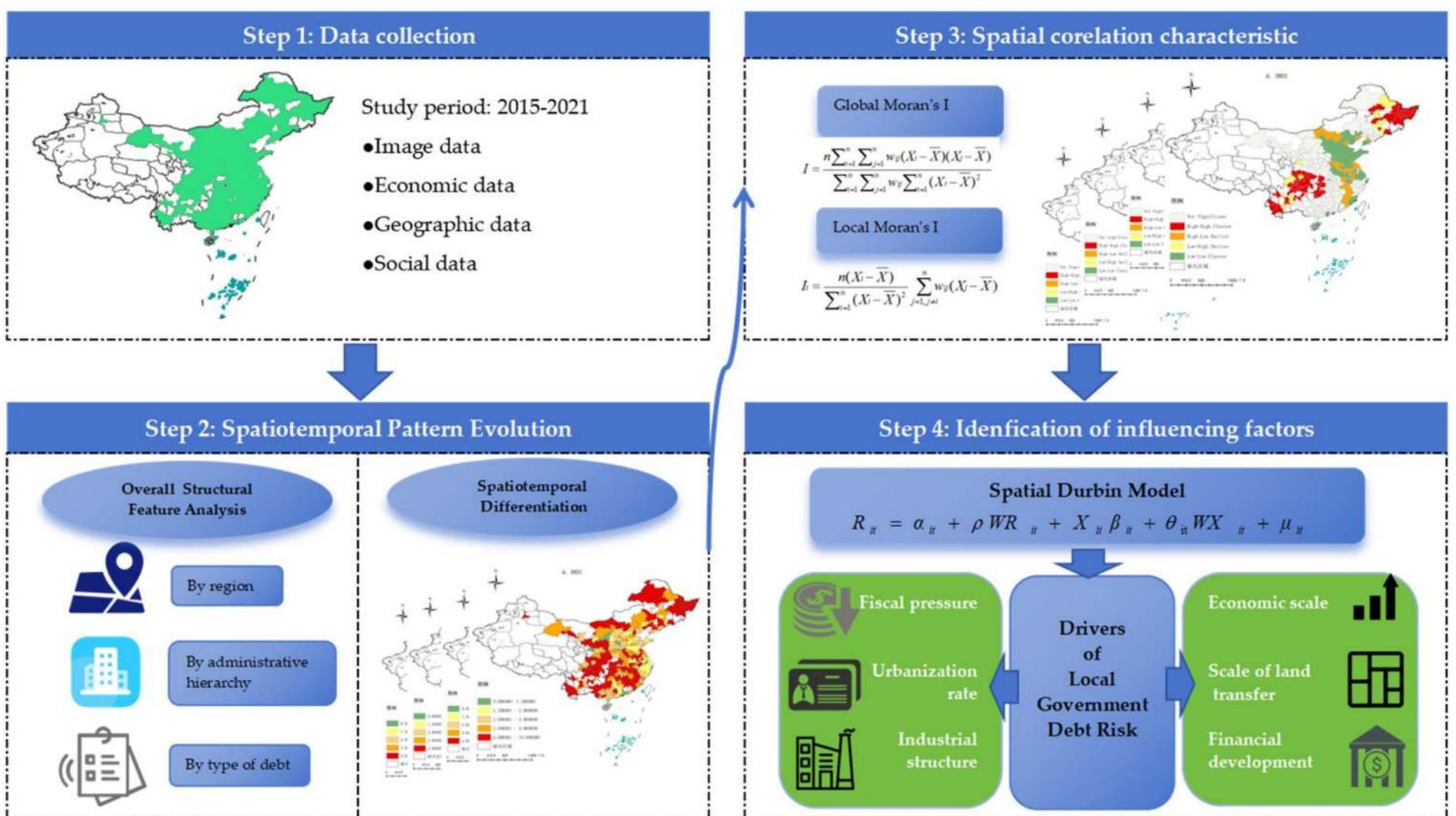


Figure 1: Technical Roadmap

Conclusions

- Overall Risk Trends (2015–2021): Local government debt risk in China's prefecture-level cities fluctuated during this period. The western region initially exhibited the highest risk, but by 2021, the central region experienced the fastest increase. Implicit debt consistently exceeded explicit debt by an average of 2,985.4 billion yuan annually.
- Spatiotemporal Distribution: Risk demonstrated clear spatial differentiation, with medium- and high-risk areas expanding contiguously. Spatial agglomeration evolved from a multi-centered pattern to a dual-centered layout (Beijing-Tianjin-Hebei and the Shandong Peninsula), eventually achieving a balance among all agglomeration types (LL, LH, HL, HH).
- Drivers and Spatial Spillover: A significant positive spatial spillover effect exists, indicating that neighboring debt risk exacerbates local risk. Key determinants include:
 - * Risk Increases: Fiscal pressure, urbanization rate, and economic scale.
 - * Risk Reduction: Industrial structure advancement, land transfer income, and financial development.
The effects vary by region, with national patterns most consistent in the central region.

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