

role of green innovation and geopolitical risk in the relationship between fiscal decentralization and sustainable development. This model contributes to enriching and refining the theoretical framework of sustainable development in the context of globalization and geopolitical turbulence, while extending the application of fiscal decentralization theory from a purely economic perspective to a multidimensional approach that incorporates environmental and global political–economic security factors.

Third, by employing the Bayesian approach – a modern and highly reliable econometric method, the dissertation identifies a nonlinear U-shaped relationship between fiscal decentralization and sustainable development. This finding represents a significant scientific contribution, as most previous studies have primarily focused on linear relationships without considering the bidirectional effects and optimal thresholds of fiscal decentralization on sustainable development. The results not only broaden theoretical understanding of the impacts of fiscal decentralization but also affirm that when decentralization surpasses a certain threshold, its effect on sustainable development can shift from negative to positive. In addition, the findings reveal that green innovation and geopolitical risk play important moderating roles in this relationship. Specifically, these two factors both have direct positive effects on sustainable development and mitigate the negative effects of fiscal decentralization during its initial stages. This contributes to reinforcing and extending foundational economic theories such as Tiebout’s fiscal decentralization theory, Public Choice Theory, and Endogenous Growth Theory, by demonstrating that the mechanism of fiscal resource allocation must be linked to green innovation capacity and resilience to global risks in order to achieve sustainable development.

Fourth, the dissertation provides empirical evidence confirming the positive effects of GDP growth, trade liberalization, and government size on sustainable development, thereby reinforcing the arguments of sustainable growth theory and open economy theory. At the same time, the results indicate that FDI and urbanization can hinder the progress of sustainable development, underscoring the need for appropriate governance and regulatory policies to redirect investment flows and urban development toward environmental friendliness and social equity.

1.2. Practical contributions

From a practical perspective, the dissertation provides several policy implications for countries seeking to promote sustainable development.

The regression results on the threshold levels of revenue and expenditure decentralization across the two country groups demonstrate strong theoretical and empirical validity. In the developed countries group, the findings reveal an inverted U-shaped relationship between fiscal decentralization and sustainable development, with the optimal thresholds estimated at 51.55% for expenditure decentralization and 31.72% for revenue decentralization. This result aligns well with the institutional characteristics and governance capacities of developed nations – where local governments possess strong administrative capabilities, transparent monitoring systems, and effective coordination mechanisms with central authorities. In such contexts, moderate decentralization enhances flexibility in public spending, improves the efficiency of public service delivery, and allows for policies tailored to local needs. However, when decentralization exceeds the optimal level, issues such as policy overlap, lack of intergovernmental coherence, and reduced macroeconomic coordination efficiency may emerge. Therefore, the “moderate” threshold identified in the study is both theoretically sound and practically justified.

In contrast, for the developing countries group, the results indicate a U-shaped relationship between fiscal decentralization and sustainable development, with the optimal thresholds estimated at 27.34% for revenue decentralization and 61.53% for expenditure decentralization. This suggests that in the early stages of decentralization – when authority and resources remain largely centralized – its impact on sustainable development is limited due to weak local governance capacity, incomplete oversight mechanisms, and persistent issues of corruption and resource misallocation. Only when decentralization surpasses approximately 60% do local governments gain sufficient autonomy to leverage local information, foster innovation, and enhance interregional competition, thereby positively contributing to sustainable development. However, beyond this point, risks of policy fragmentation, regional disparities, and weak governance begin to surface. Thus, the higher threshold observed in developing countries is theoretically well-founded and reflects the realistic nature of the decentralization process in these nations.

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