Sustainable Development

RESEARCH ARTICLE OPEN ACCESS

Fiscal Autonomy and the Path to Sustainable Local Economic Development: A Multilevel Municipal Analysis in South Africa

Nara Monkam[1] | Charles Shaaba Saba[2]

[1]Department of Economics, Faculty of Economic and Management Sciences (EMS), University of Pretoria Private Bag x20, Hatfield, Pretoria, South Africa | [2]Trilateral Chair in Transformative Innovation, the Fourth Industrial Revolution and Sustainable Development, College of Business and Economics, University of Johannesburg, Johannesburg, South Africa

Correspondence: Charles Shaaba Saba (sabacharlesshaaba@yahoo.com)

Received: 28 October 2024 | **Revised:** 7 April 2025 | **Accepted:** 21 April 2025

Funding: This work was supported by Google General Research Support Grant.

Keywords: fiscal autonomy | local economic development (LED) | municipal categories | panel data | South Africa

ABSTRACT

Despite fiscal reforms aimed at achieving Sustainable Development Goal Target 17.1—strengthening domestic resource mobilization for development—the impact of fiscal autonomy on local economic development (LED) in South Africa remains underexplored. Therefore, this study examines the impact of fiscal autonomy across 248 municipalities from 2009 to 2023, employing a range of advanced econometric methods. The results highlight a complex relationship: System Generalized Method of Moments analysis shows fiscal autonomy negatively affects LED in metropolitan municipalities (Category A) but has positive effects in the full sample, as well as in district (Category C) and local municipalities (Category B). The methods of moments quantile bootstrap regression shows that fiscal autonomy promotes LED across all quantiles for the full sample and in Category B. However, Category A exhibits a negative impact, whereas Category B shows an insignificant negative effect across all quantiles. These findings emphasize the need for differentiated policies. Metropolitan municipalities require targeted governance and fiscal reforms to mitigate negative outcomes while expanding fiscal autonomy for local and district municipalities could significantly enhance LED. This research offers practical insights for tailored fiscal strategies, promoting sustainable economic growth across South Africa's varied municipal landscapes.

JEL Classification: C23, E6, O1

1 | Introduction

Fiscal decentralization refers to the process by which central governments transfer fiscal responsibilities and resources to lower levels of government (e.g., regional, provincial, or local governments) (Faguet 2004; Boetti et al. 2012; Gadenne and Singhal 2014; Putri and Saputra 2019). Fiscal autonomy, on the other hand, refers to the degree of independence that lower levels of government (regional, local) have in managing their own finances, especially in terms of raising revenues (e.g., taxes, fees) and making spending decisions (Van Zyl 2003; Faridi and Nazar 2013; Didik et al. 2018; Lin and Zhou 2022; Linawati and Solikin 2024). The role of fiscal autonomy in promoting local economic development (LED) has gained increasing attention in recent policy discussions, especially in developing economies such as South Africa. However, the extent to which fiscal autonomy contributes to LED across different categories of municipalities—metropolitan (Category A), district (Category C), and local (Category B)—remains underexplored. South Africa's municipalities exhibit significant disparities in terms of fiscal capacity, governance and economic strength, which

impacts their ability to effectively utilize fiscal autonomy for promoting LED. This study seeks to understand how fiscal autonomy influences LED across South Africa's three categories of municipalities and provides insights into the differentiated impacts.

South African municipalities have varying degrees of fiscal autonomy under Section 229 of the 1996 Constitution, relying primarily on property rates, licenses, service charges, and intergovernmental transfers. However, fiscal autonomy is often limited by structural inefficiencies, particularly in metro municipalities, where governance complexities hinder effective fund allocation (Van Zyl 2003). For district and local municipalities, whereas fiscal autonomy holds potential, it is constrained by inadequate financial and administrative capacities, which affect their ability to stimulate local economic growth (Monkam 2014; Gumede et al. 2019; Mazibuko 2019; Cameron 2021). Despite ongoing fiscal decentralization and autonomy reforms, many municipalities struggle to mobilize resources efficiently to foster LED, thus failing to achieve the desired economic outcomes.

Existing literature on fiscal autonomy has largely focused on its impact on poverty reduction, environmental governance, spending efficiency, and regional inequalities (Blöchliger and Rabesona 2009; Sacchi and Salotti 2014; Faridi and Nazar 2013). Several studies emphasize the role of fiscal autonomy in promoting economic growth and LED, highlighting its advantages for local governments. However, the effects of fiscal autonomy are often context-specific. Notable examples include works by Blöchliger and Rabesona (2009), Boetti et al. (2012), Sacchi and Salotti (2014), Faridi and Nazar (2013), and Hughes Hallett (2017), among others. These studies illustrate the varying impacts of fiscal autonomy depending on local conditions and governance structures.

More recently, Lin and Zhou (2022) find that fiscal autonomy can have negative environmental effects by hindering industrial upgrading in China. Similarly, Tan (2020) and Sanggrangbano et al. (2024) explore how fiscal autonomy positively impacts economic development in Papua, emphasizing the role of targeted fiscal spending in regional growth. However, a significant gap remains in understanding how fiscal autonomy affects LED, particularly across different categories of municipalities. Although studies such as those by Lin and Zhou (2022) have explored the impact of fiscal autonomy in specific sectors like environmental pollution, there is a lack of comprehensive analysis on the differentiated effects of fiscal autonomy on LED in a country with diverse municipal structures like South Africa. This study addresses the gap in the literature by focusing on the differential impacts of fiscal autonomy across metro (Category A), district (Category C), and local (Category B) municipalities in South Africa. By employing advanced econometric techniques such as System Generalized Method of Moments (s-GMM), methods of moments quantile bootstrap regression (MMQ-BR) and Powell's (2022) panel quantile regression with fixed effects (PPQR-FE), the research explores the nuanced effects of fiscal autonomy on LED across different quantiles of economic development. Understanding these dynamics is critical for designing tailored fiscal autonomy policies that can enhance local governance and economic outcomes.

This study significantly advances the discourse on fiscal decentralization by providing a pioneering multi-level analysis of fiscal autonomy's impact on LED across South Africa's diverse municipal categories. The importance of this study lies in its rigorous empirical approach, leveraging the aforementioned advanced econometric methods to uncover nuanced, context-specific effects that previous studies have overlooked. By focusing on 248 municipalities over the 2009–2023 period, the paper addresses a critical gap in understanding how fiscal autonomy operates within a developing economy marked by stark disparities in municipal capacity and economic performance. This research is vital for informing evidence-based policymaking, offering actionable insights to optimize fiscal strategies that align with the United Nations' Sustainable Development Goal (SDG) Target 17.1 on domestic resource mobilization. Furthermore, its quantile-based analysis illuminates the heterogeneous effects of fiscal autonomy across different stages of economic development, contributing a novel dimension to global fiscal decentralization literature (Bahl and Martinez-Vazquez 2006; Smoke 2015). The findings challenge one-size-fits-all approaches, underscoring the necessity of tailored governance reforms to enhance LED, particularly in a post-apartheid context where historical inequities continue to shape municipal outcomes (Turok 2014). Data on fiscal autonomy, LED, and control variables such as human capital, gross fixed capital formation, and trade openness are sourced from the Quantec and South African National Treasury databases. Econometric models, including pooled ordinary least squares (OLS), fixed effects (FEs), Driscoll–Kraay (D-K) cross-sectional dependence (Driscoll and Kraay 1998), s-GMM, MMQ-BR, and PPQR-FE, are applied to capture the dynamic and heterogeneous effects of fiscal autonomy on LED. This robust methodological approach allows for a comprehensive analysis that addresses issues such as endogeneity, autocorrelation, and heteroskedasticity.

Our econometric analysis further enhances the understanding of the subject, as the s-GMM findings indicate that fiscal autonomy negatively impacts LED in the eight metropolitan areas (Category A) but positively influences the full sample, including 41 district municipalities (Category C) and 199 local municipalities (Category B). In contrast, MMQ-BR results suggest that fiscal autonomy promotes LED across all quantiles in the full sample and Category B, except at quantiles 0.05 and 0.1 but not in Categories A and C. The reliability of the MMQ-BR results was confirmed through a robustness check using the PPQR-FE approach. This implies fiscal autonomy benefits differ by municipality category, requiring tailored policy interventions, which are provided in Section 5 of this study.

The paper consists of five additional sections. Section 2 reviews the existing literature, whereas Section 3 outlines the methodology and data. Section 4 presents and discusses the results. Finally, Section 5 discusses the policy implications, and Section 6 concludes with limitations and suggestions for future research.

2 | Literature Review and Hypotheses Development

The concept of fiscal autonomy has been explored in various contexts, including environmental pollution, spending efficiency, poverty, regional inequality, intergovernmental grants,

economic governance, local economic growth, and economic development (see for example, Blöchliger and Rabesona 2009; Boetti et al. 2012; Faridi and Nazar 2013; Sacchi and Salotti 2014; Hughes Hallett 2017; Didik et al. 2018; Putri and Saputra 2019; Lin and Zhou 2022; Tan 2020; Sanggrangbano et al. 2024; Linawati and Solikin 2024, among others). For example, Blöchliger and Rabesona's (2009) study provided an update on the statistical data on the fiscal autonomy of subcentral governments (SCGs), focusing on their taxing power and intergovernmental grants. The main methodology of the study involves using a taxonomy of tax autonomy and analyzing data from Organization for Economic Co-operation and Development (OECD) member countries. The key findings reveal that SCGs have considerable discretion over tax revenues, although this varies by country and type of tax. Tax sharing arrangements remain significant, and intergovernmental grants play a vital role in addressing fiscal disparities between central and local governments.

Faridi and Nazar (2013) evaluate the impact of fiscal autonomy on poverty reduction in Pakistan. OLS regression analysis on time-series data from 1972 to 2010 was used. The study finds that greater fiscal autonomy, through decentralized provincial expenditure and revenue control, significantly reduces poverty, particularly by increasing local governments' ability to better target services and enhance efficiency. The findings of the study suggest that more fiscal independence for provincial governments is crucial for effective poverty reduction. Sacchi and Salotti (2014) examine the regional inequality–fiscal decentralisation nexus, considering the role of SCG autonomy in 21 OECD countries from 1981 to 2005. The main methodology involves the use of econometric models with various indicators for tax and expenditure decentralization, including new indices that account for local government autonomy. The findings suggest a negative relationship between fiscal decentralization and regional disparities, indicating that higher economic inequality across regions tends to reduce decentralization. This is particularly evident when considering the autonomy of local governments in tax and expenditure decisions. Putri and Saputra (2019) explore how fiscal autonomy, through fiscal decentralization, affects local economic growth and poverty in East Java, Indonesia. The main methodology used is Path Analysis on panel data from 2010 to 2015 across regencies and cities. The key findings reveal that local financial performance significantly impacts economic growth and poverty, with differing directional relationships. Despite fiscal policy being designed for both growth and poverty reduction, limitations in fiscal capacity and inequality pose challenges. The pro-poor growth index (PPGI) shows varying benefits for the poor across regions.

Hughes Hallett's (2017) study examines the balance between fiscal autonomy and fiscal federalism within the Eurozone, focusing on the implications for economic governance. The main methodology involves reviewing existing fiscal frameworks and applying principal-agent models to evaluate autonomy in tax and expenditure decisions. The study finds that although fiscal federalism can enhance regional economic stability through coordinated policies, careful design is needed to ensure efficient redistribution and to avoid undermining national autonomy. Lin and Zhou (2022) investigate how fiscal autonomy influences urban environmental pollution in China. The main methodology used in the study is an econometric analysis of panel data from 277 cities from 2004 to 2019, exploring fiscal autonomy's impact through industrial structure upgrading and green technological innovation. The study finds that fiscal autonomy tends to increase pollution emissions, particularly by limiting industrial advancement and innovation. However, the impact varies depending on the region's economic development level and administrative status.

Cifuentes-Faura et al. (2022) investigate the determinants of local government deficits across Spanish municipalities, employing the method of moments quantile regression and causality test over 2011–2020. They find that economic growth reduces deficits, whereas unemployment and right-wing governance increase them at upper quantiles. In contrast, Cifuentes-Faura et al. (2024) assess financial autonomy convergence in Spanish municipalities through β- and σ-convergence techniques. They reveal that smaller municipalities converge faster in autonomy than larger ones. Although the former focuses on the *fiscal determinants* of deficits using econometric modeling, the latter evaluates *structural convergence* in fiscal autonomy across space and time. Together, they highlight both the causes of fiscal imbalance and the evolving spatial dynamics of municipal financial autonomy.

Tan (2020) explores the impact of education spending from fiscal autonomy funds on Papua's economic development. The main methodology involves using panel data regression with the feasible generalized least square (FGLS) approach. The key findings indicate that education spending, physical capital investment, and average years of schooling significantly enhance Papua's economic growth, whereas population growth negatively affects per capita income and economic development. These results highlight the importance of targeted fiscal policies for regional development in Papua. In a different study for Papua, Sanggrangbano et al. (2024) investigate the impact of special autonomy fiscal policy, particularly education spending from fiscal autonomy, on the economic development of Papua between 2013 and 2021. Batteries of econometric approaches were applied, and they include panel data regression and the FGLS approach, employing either the panel corrected standard error (PCSE) model or the seemingly unrelated regression (SUR) model. The main findings indicate that education spending and other economic variables significantly drive economic growth in Papua, demonstrating the effectiveness of the autonomy fiscal policy in promoting regional development.

Boetti et al. (2012) examines how fiscal autonomy affects the spending efficiency of local governments, particularly in Italian municipalities. The main methodology employed includes both parametric (SFA) and nonparametric (DEA) frontier estimation techniques to assess inefficiencies in local government spending. The key findings indicate that municipalities with higher fiscal autonomy exhibit reduced inefficiencies in spending, supporting the push for tax decentralization reforms aimed at improving local government accountability and efficiency. Alibegović et al.'s (2019) study measured and compared the fiscal autonomy of large cities in Croatia, Serbia, and Bosnia and Herzegovina, which are key drivers of local development, against other local government units. The methodology used in the study involves calculating the fiscal autonomy index for both large cities and smaller local units. The findings indicate that large cities have

limited fiscal autonomy, similar to other local units, highlighting the need for improved budget capacity to enhance local development activities in these regions.

Van Zyl (2003) examines the role of fiscal autonomy in provincial governance in South Africa, focusing on both constitutional provisions and practical implementation challenges. The study utilizes a constitutional analysis and case study approach to explore fiscal policies and intergovernmental dynamics within the country. The study reveals that fiscal autonomy in South Africa is limited in practice because of national government control, despite constitutional provisions for provincial independence. Didik et al. (2018) investigate the impact of fiscal autonomy, investment, and local expenditure on economic growth in Southern Sumatra, Indonesia. Using panel data regression, the study examines the relationship between these variables across multiple provinces. The findings reveal that fiscal autonomy, particularly through local taxes and retributions, plays a significant role in driving economic growth in the region. Linawati and Solikin (2024) examine the impact of fiscal autonomy on economic growth in Kediri City, Indonesia, with a focus on regional taxes and levies. Their findings reveal that, despite fluctuations in Kediri City's fiscal decentralization, higher regional tax and levy collection is positively associated with economic growth.

2.1 | Gap in the Empirical Literature

Despite extensive research, a clear gap remains in understanding how *fiscal autonomy impacts LED* across different municipal categories in a developing country like South Africa. The studies reviewed either focus on *fiscal autonomy's impact on poverty*, *regional inequality*, or *spending efficiency*, among others, but none, to our knowledge, provide a nuanced examination of *municipal*-category *dynamics* in a diverse nation with distinct metropolitan, district, and local municipalities. This study fills this gap by investigating how fiscal autonomy affects LED in South Africa's three categories of municipalities (metropolitan, district, and local). Using advanced econometric techniques such as s-GMM, MMQ-BR, Powell's (2022) PPQR-FE among others. This study provides policy insights for how fiscal autonomy's impact varies across different categories of municipalities, a perspective not adequately explored in previous literature. The focus on LED at various municipal levels provides critical empirical evidence for policymakers to tailor fiscal decentralization policies effectively.

Based on the review of relevant prior research, we propose the following hypotheses for this study:

H01. *Fiscal autonomy has no significant influence on LED in the three categories of municipalities.*

HA1. *Fiscal autonomy significantly influences LED in the three categories of municipalities.*

H02. *Fiscal autonomy, across all quantile levels, has no significant impact on LED in the three categories of municipalities.*

HA2. *Fiscal autonomy significantly impacts LED across all quantile levels in the three categories of municipalities.*

3 | Methodology and Data

3.1 | Empirical Strategies

In this study, we employed panel unit root tests using the Levin–Lin–Chu (LLC) (Levin et al. 2002) and Im–Pesaran–Shin (IPS) (Im et al. 2003) methods to avoid spurious regression and determine the feasibility of performing cointegration analysis. We used the Johansen–Fisher cointegration test to assess the long-run equilibrium relationship between the model's variables. Before applying the standard regression models, we conducted pre-tests, including the Breusch–Pagan test, Wooldridge autocorrelation test, and modified Wald test. These tests were performed to confirm the presence of autocorrelation and groupwise heteroskedasticity. For the standard regression analysis, we applied models including pooled OLS (P-OLS), FE, D-K cross-sectional dependence, and Two-Step System-Generalized Method of Moments (Two-Step s-GMM) estimation techniques. We employed the D-K cross-sectional dependence estimator because it also effectively addresses issues of autocorrelation, heteroscedasticity (changing variance), and cross-sectional dependence in panel data. This robustness ensures more reliable and conclusive results. The Two-Step s-GMM technique that incorporates forward orthogonal deviations was used to account for the issues of endogeneity and other econometric problems.

The Swamy, Shapiro–Wilk, and skewness–kurtosis tests were conducted to assess whether the slope homogeneity and residuals of the variables in the regression models follow a normal distribution before applying the MMQ-BR technique (Machado and Silva 2019). The standard linear regression approaches mentioned above will be performed first and then compared with the nonlinear MMQ-BR regression model to evaluate the impact of fiscal autonomy on LED. The regression results will be analyzed to determine whether the estimated coefficients effectively capture the non-linear and heterogeneous features of the model. Additionally, for robustness checks, we employed Powell's (2022) PPQR-FE. This approach is essential for robustness testing as it addresses key limitations in traditional panel quantile models, particularly nonadditive FEs and endogeneity. It allows for individual-specific heterogeneity while ensuring consistency of estimates across quantiles without imposing separability assumptions. Its advantage lies in estimating structural quantile functions with valid inference, even in panels with endogenous regressors and time-invariant unobserved heterogeneity.

3.2 | Theoretical Underpinning and Empirical Model Specification

The theoretical connection between fiscal autonomy and LED can be understood through key economic frameworks, such as endogenous growth theory and fiscal decentralization. These theories offer insights into how fiscal autonomy can lead to the efficient allocation of resources, promote innovation, and stimulate LED. The concept of fiscal decentralization is the process of shifting financial powers and responsibilities from the central government to lower levels, such as regional or local governments. This allows local authorities to manage revenue collection and public spending, ensuring decisions are made

closer to citizens' needs and preferences. As a result of this, local governments benefit from fiscal autonomy by being able to allocate resources efficiently, adapt to local needs, and foster regional growth/development through decentralizing fiscal powers (fiscal autonomy). According to Oates (1972), fiscal decentralization enhances allocation efficiency, whereas Musgrave and Musgrave (1959) believe local government accountability improves governance and investment efficiency. By tailoring policies to local needs and promoting local development, fiscal autonomy could reduce municipal disparities and promote sustainable development in South Africa.

The endogenous growth theory states that the economy's internal components—such as infrastructure, innovation, and human capital—are what largely drive economic growth. The size of the labor force and total gross fixed capital formation are important drivers of growth in the context of LED. Sala-i-Martin and Barro (1995) stress the significance of investments in physical infrastructure and capital formation, whereas Romer (1990) emphasizes the relevance of human capital and innovation in promoting economic growth. Also, according to Frankel and Romer (2017), trade openness is often associated with higher economic growth as it promotes the exchange of goods, services, and knowledge, leading to technology spillovers and more efficient resource allocation across countries or regions. As South African municipalities are open to trade (Skinner 1999), they benefit from increased access to markets and resources, fostering economic progress. Local governments with more budgetary autonomy under a decentralized fiscal system are better positioned to make these crucial investments and provide the circumstances necessary to support LED. These factors together could provide an explanation of the forces that propel local economies to make progress.

Given the theoretical framework, the relationship between LED and the independent variables (fiscal autonomy, gross fixed capital formation, labor force, and trade openness) can be expressed as:

$$\mathrm{GVA} = f(\mathrm{LLFISAUT},\ \ \mathrm{LGFCF}, \mathrm{LHUMC}, \mathrm{LLBR}, \mathrm{LTRD}) \quad (1)$$

Econometric form of the equation:

$$\mathrm{LGVA}_{0i,t} = \beta_0 + \beth_{01}\mathrm{LLFISAUT}_{i,t} + \sum_{i=1}^{4} \beth_{0i}\mathrm{Controls}_{i,t} + \varepsilon_{1it} \quad (2)$$

where β_0 is the constant term; $\beth_{01}, \beth_{02}, \beth_{03}, \beth_{04}, \beth_{05}$ are the coefficients for each independent variable; ε_{1it} is the error term; i and t denotes the country and year, respectively. The details of the variables can be found in Table 1.

$$\mathrm{LGVA}_{1i,t} = \beta_1 + \beth_{11}\mathrm{LLFISAUT}_{i,t} + \beth_{12}\mathrm{FCATE\_}A_{i,t} + \sum_{i=1}^{4} \beth_{1i}\mathrm{Controls}_{i,t} + \varepsilon_{1i,t} \quad (3)$$

$$\mathrm{LGVA}_{2i,t} = \beta_2 + \beth_{21}\mathrm{LLFISAUT}_{i,t} + \beth_{22}\mathrm{FCATE\_B}_{i,t} + \sum_{i=1}^{4} \beth_{2i}\mathrm{Controls}_{i,t} + \varepsilon_{2i,t} \quad (4)$$

$$\mathrm{LGVA}_{3i,t} = \beta_3 + \beth_{31}\mathrm{LLFISAUT}_{i,t} + \beth_{32}\mathrm{FCATE\_C}_{i,t} + \sum_{i=1}^{4} \beth_{3i}\mathrm{Controls}_{i,t} + \varepsilon_{3i,t} \quad (5)$$

3.2.1 | Two-Step s-GMM Approach

This study employs the generalized method of moments (GMM) system for estimation. Dynamic panel estimators from the Arellano-Bond (1991), Arellano and Bover (1995), and Blundell-Bond (1998) families are widely used in empirical research (Roodman 2009). GMM requires meeting specific criteria: First, the time dimension (T) must be less than the number of observations (N). This condition holds true for all three categories of municipalities in the study. Second, the regressor must be dynamic, that is, the LED. GMM accounts for endogeneity bias using time-varying variables (Saba et al. 2025). Third, it addresses individual FEs and limits over-identification through Roodman's (2009) extensions. At last, cross-sectional dependence is considered to prevent instrument proliferation (Baltagi et al. 2007). The estimation procedure for the standard GMM system is as follows:

Full sample model (includes all municipalities):

$$\mathrm{LGVA}_{i,t} = \eth_0 + \beta_0\mathrm{LGVA}_{i,t-1} + \beth_{01}\mathrm{LLFISAUT}_{i,t} + \sum_{i=1}^{4} \beth_{0i}\mathrm{Controls}_{i,t} + \tau_i + \lambda_t + \varepsilon_{it} \quad (6)$$

Category A municipality model:

$$\mathrm{LGVA}_{i,t} = \eth_1 + \beta_1\mathrm{LGVA}_{i,t-1} + \beth_{11}\mathrm{LLFISAUT}_{i,t} + \beth_{12}\mathrm{FCATE\_A}_{i,t} + \sum_{i=1}^{4} \beth_{1i}\mathrm{Controls}_{i,t} + \tau_i + \lambda_t + \varepsilon_{it} \quad (7)$$

Category B municipality model:

$$\mathrm{LGVA}_{i,t} = \eth_2 + \beta_2\mathrm{LGVA}_{i,t-1} + \beth_{21}\mathrm{LLFISAUT}_{i,t} + \beth_{22}\mathrm{FCATE\_B}_{i,t} + \sum_{i=1}^{4} \beth_{2i}\mathrm{Controls}_{i,t} + \tau_i + \lambda_t + \varepsilon_{it} \quad (8)$$

Category C municipality model:

$$\mathrm{LGVA}_{i,t} = \eth_3 + \beta_3\mathrm{LGVA}_{i,t-1} + \beth_{31}\mathrm{LLFISAUT}_{i,t} + \beth_{32}\mathrm{FCATE\_C}_{i,t} + \sum_{i=1}^{4} \beth_{3i}\mathrm{Controls}_{i,t} + \tau_i + \lambda_t + \varepsilon_{it} \quad (9)$$

where $\beta, \beth, \varepsilon_{it}, \tau_i$, and λ_t represents the coefficient of the lagged dependent variable, coefficient of regressors, error term, country-specific and time-specific effects, respectively. The details of the variables can be found in Table 1.

3.2.2 | MMQ-BR Approach

After applying the s-GMM approach, we then employ the MMQ-BR approach to assess the non-linear and heterogeneous effects of fiscal autonomy on LED across different quantiles of the distribution. Alvarado et al. (2021) and Machado and Silva (2019) highlight several advantages of using the MMQ-BR model. First, the MMQ-BR is consistent and efficient when dealing with endogenous regressors and FEs. Its triangular structure allows for the sequential calculation of the one-step GMM estimator (Machado and Silva 2019). Second, the MMQ-BR estimates the marginal effects of each independent variable on the dependent variable across the entire quantile distribution. Third, it accounts for heterogeneity among countries when estimating coefficients.

TABLE 1 | Variable description.

Variables	Description	Measurement	Sources
Dependant variable			
LGVA	Log of gross value added at basic prices proxy for local economic development. Gross value added (GVA) at basic prices is a robust proxy for local economic development (LED) as it reflects economic output, sectoral contributions, and allows regional comparisons. GVA is widely supported in development literature (Kitson et al. 2004; Martin et al. 2015; Fenton 2018)	*R* millions constant 2015 prices	EasyData—Quantec database
Independent variables			
LGFCF	Log of gross fixed capital formation (total) serves as proxy for investment	*R* millions constant 2015 prices	EasyData—Quantec database
LHUMC	Log of persons' level of education by gender, population group and age group at 2016 local municipality/ward-based metro region level (total) serves as proxy for human capital	Frequency: annual	EasyData—Quantec database
LLBR	Log of labor force/economically active (total)	Frequency: annual	EasyData—Quantec database
LTRD	Log of trade openness variable was obtained by log(((export + import)/output)*100). The export (*R* million constant 2015 prices), import (*R* million constant 2015 prices) and output (*R* millions constant 2015 prices) variables were sources from EasyData—Quantec database		Authors
LLFISAUT	Log of fiscal autonomy variable was obtained by (property rates + licenses and permits + service charges)/(total operating revenue). The property rates, licenses and permits, service charges and total operating revenue variables were sourced from South Africa National treasury database		Authors
D_1	Dummy variable equal to 1 if a municipality is categorized as a metro (Category A) and 0 otherwise		Authors
D_2	Dummy variable equals 1 if a municipality is categorized as a district municipality (Category C) and 0 otherwise		Authors
D_3	Dummy variable equals 1 if a municipality is categorized as a local municipality (Category B) and 0 otherwise		Authors
FCATE_A	$\text{FCATE\_A} = \text{LLFISAUT}_{it} * D_1$ is fiscal autonomy for *metro municipalities* (Category A)		Authors
FCATE_C	$\text{FCATE\_C} = \text{LLFISAUT}_{it} * D_2$ is fiscal autonomy for *district municipality* (Category C)		Authors
FCATE_B	$\text{FCATE\_B} = \text{LLFISAUT}_{it} * D_3$ is fiscal autonomy for *local municipality* (Category B)		Authors

Source: Authors' compilation.

The MMQ-BR equation takes the following form:

$$Q_{ID}\left(\beth \mid X_{i,t}\right) = \left(\omega_0 + \varphi_i \rho(\beth)\right) + X'_{i,t}\xi + Z'_{it}\vartheta\rho(\beth) \tag{10}$$

where $Q_{ID}\left(\beth \mid X_{i,t}\right), \beth, (\omega, \varphi, \xi, \vartheta), \left(\omega_0 + \varphi_i \rho(\beth)\right)$ and Z'_{it} stands for the conditional quantile distribution of the regressand variable, quantile levels, parameters of interest, the scalar coefficient, K vector of known components of $X_{i,t}$ normalized to fulfill the moment conditions, respectively (Machado and Silva 2019). We adapt the above equation for our regression analysis, which takes the following form:

$$Q_{\text{LGVA}}\left(\beth \mid \omega_{1i}, \tau_{1t}, X_{1i,t}\right) = \omega_{1i} + \psi_{11}\text{LLFISAUT}_{i,t} + \sum_{i=1}^{4} \psi_{1i}\text{Controls}_{i,t} + \Gamma_{1t} + \varepsilon_{1i,t} \tag{11}$$

$$Q_{\text{LGVA}}\left(\beth \mid \omega_{2i}, \tau_{2t}, X_{2i,t}\right) = \omega_{2i} + \psi_{21}\text{LLFISAUT}_{i,t} + \psi_{22}\text{FCATE\_A}_{i,t} + \sum_{i=1}^{4} \psi_{2i}\text{Controls}_{i,t} + \Gamma_{2t} + \varepsilon_{2i,t} \tag{12}$$

$$Q_{\text{LGVA}}\left(\beth \mid \omega_{3i}, \tau_{3t}, X_{3i,t}\right) = \omega_{3i} + \psi_{31}\text{LLFISAUT}_{i,t} + \psi_{32}\text{FCATE\_B}_{i,t} + \sum_{i=1}^{4} \psi_{3i}\text{Controls}_{i,t} + \Gamma_{3t} + \varepsilon_{3i,t} \tag{13}$$

$$Q_{\mathrm{LGVA}}\left(\beth \mid \omega_{4i}, \tau_{4t}, X_{4i,t}\right) = \omega_{4i} + \psi_{41}\mathrm{LLFISAUT}_{i,t} + \psi_{42}\mathrm{FCATE\_C}_{i,t} + \sum_{i=1}^{4} \psi_{4i}\mathrm{Controls}_{i,t} + \Gamma_{4t} + \varepsilon_{4i,t} \quad (14)$$

where $Q_{ID}\left(\beth \mid X_{i,t}\right)$, ω_{ki}, Γ_{kt}, ψ_{ki}, and $\varepsilon_{ki,t}$ stands for quantile distribution, unobserved country, time FE, coefficients to estimate, and the error term, respectively. The control variables are explained in Table 1. The MMQ-BR method was used to examine the heterogeneous effects of fiscal autonomy and other explanatory variables on the conditional distribution of LED across the 0.05, 0.10, 0.25, 0.50, 0.75, 0.90, and 0.95 percentiles. For robustness checks, we employed Powell's (2022) PPQR-FE as mentioned earlier.

3.3 | Data and Variables Description

This study utilizes annual panel data from 248 municipalities, comprising 8 metro municipalities (Category A), 41 district municipalities (Category C), and 199 local municipalities (Category B), covering the period from 2009 to 2023. Municipalities are classified as metropolitan, district, or local based on their administrative, fiscal, and economic traits. This classification reflects their structural differences, crucial for analyzing fiscal autonomy's impact on LED. Metropolitan municipalities are major urban centers with high economic potential but complex governance challenges. District municipalities coordinate and support local municipalities, often with moderate fiscal capacity. Local municipalities, mainly rural or semi-urban, focus on direct service delivery but face financial and administrative constraints, limiting their ability to leverage fiscal autonomy. The selection of these municipalities was based on the availability of data for the variables listed in Table 1. The use of recent data ensures the study's relevance to current policy, fiscal strategies, and LED planning. The primary data sources are the EasyData–Quantec[1] and South African National Treasury[2] databases. Table 1 outlines the variables used in the analysis, and Table 2 presents the list of municipalities categorized accordingly.

4 | Empirical Results and Discussion

4.1 | Preliminary Analysis (Descriptive Statistics Results and Scatter Plot)

The descriptive statistics in Table 3 provide insights into the distribution, central tendency, and variability of our variables of interest (i.e., LGVA, LLFISAUT, FCATE_A, FCATE_B, and FCATE_C) in this study. The mean of LGVA (Log of gross value-added proxy for LED) is 8.691, which is higher than the median of 8.410, suggesting a right-skewed distribution. This indicates that although most municipalities have a lower economic output, there are a few with significantly higher outputs, pulling the mean upwards. The maximum and minimum values range from 5.74 to 13.25, indicating significant variability in LED across municipalities. The value of the standard deviation is 1.421, indicating moderate variability in LGVA across the observations, suggesting differences in LED levels among municipalities. The gross value added (GVA) reflects economic activity and regional development levels, with higher values indicating more developed municipalities. The positive skewness in GVA suggests that economic activity is concentrated in a few municipalities, supporting theories of agglomeration economies (Krugman 1991).

The average value for fiscal autonomy (LLFISAUT) at the panel level is −1.030, indicating low fiscal autonomy among municipalities, with some experiencing negative net fiscal autonomy. The median value of −0.768 at the panel level is higher than the mean, suggesting a left-skewed distribution. A standard deviation of 0.786 signifies that fiscal autonomy varies significantly across municipalities. The mean fiscal autonomy values for metro municipalities (FCATE_A), district municipalities (FCATE_C), and local municipalities (FCATE_B) are −0.025, −0.005, and −0.999, respectively. This suggests that fiscal autonomy at the metro, district, and local municipality levels is generally low, with the negative values indicating a deficit in fiscal autonomy. Given the importance of fiscal autonomy for local governance and economic development, the negative mean values at both the panel and disaggregated municipality levels (FCATE_A, FCATE_B, and FCATE_C) indicate low fiscal independence, consistent with theories on the challenges of fiscal decentralization (Oates 2004). The median values of 0.000, 0.000, and −0.766 for the municipality categories FCATE_A, FCATE_C, and FCATE_B, respectively, indicate that half of the observations have a fiscal autonomy level of zero or below. The standard deviations of 0.110, 0.108, and 0.808 for metro, district, and local municipalities, respectively, suggest minimal variability, low variability, and moderate variability in fiscal autonomy among these municipalities.

Overall, for the descriptive statistics, the variables of interest exhibit varying degrees of skewness and kurtosis, with most variables showing significant deviations from normality as confirmed by the Jarque–Bera test. LGVA shows moderate right skewness and is closer to normality compared with the fiscal autonomy variables, which display significant left skewness and highly leptokurtic distributions, particularly for the fiscal autonomy variables related to metro and district municipalities. These observations reflect the disparities in economic development and fiscal autonomy across different types of municipalities in South Africa.

The scatter plot's fitted regression line suggests a positive relationship between overall fiscal autonomy and LED in South African municipalities, including local municipalities (Category B). However, a negative relationship exists between fiscal autonomy and LED in metro and district municipalities. Other explanatory variables, such as human capital (LHUMC), gross fixed capital formation (LGFCF) as a proxy for investment, labor force (LLBR), and trade openness (LTRD), all show a positive relationship with LED. The scatter plots in Figure 1 provide valuable initial visual exploration of the data, offering a straightforward way to identify potential relationships between variables. However, they have limitations that make them insufficient for deriving policy implications, especially in complex economic contexts such as South Africa. This necessitates the further application of

TABLE 2 | List of municipalities by categories.

Municipalities	Municipalities
Metro municipalities (Category A)	Buffalo City, Cape Town, City of Ekurhuleni, eThekwini, City of Johannesburg, Mangaung, Nelson Mandela Bay, City of Tshwane
District municipalities (Category C)	Alfred Nzo; Amajuba; Amathole; Bojanala; Cape Winelands; Capricorn; Central Karoo; Chris Hani; Dr. Kenneth Kaunda; Dr. Ruth Segomotsi Mompati; Ehlanzeni; Fezile Dabi; Frances Baard; Gert Sibande; Harry Gwala; iLembe; Joe Gqabi; John Taolo Gaetsewe; Lejweleputswa; Mopani; Namakwa; Ngaka Modiri Molema; Nkangala; O.R. Tambo; Overberg; Pixley ka Seme; Sarah Baartman; Sedibeng; Thabo Mofutsanyane; Ugu; Umgungundlovu; Umkhanyakude; Umzinyathi; Uthukela; Vhembe; Waterberg; West Coast; West Rand; Xhariep; Z F Mgcawu; Zululand
Local municipalities (Category B)	!Kai! Garib;!Kheis; Abaqulusi; Amahlathi; Ba-Phalaborwa; Beaufort West; Bela Bela; Bergrivier; Bitou; Blouberg; Blue Crane Route; Breede Valley; Bushbuckridge; Cape Agulhas; Cederberg; City of Matlosana; Dannhauser; Dihlabeng; Dikgatlong; Dipaleseng; Ditsobotla; Dr. Beyers Naude; Dr. J.S. Moroka; Drakenstein; eDumbe; Elias Motsoaledi; Elundini; Emadlangeni; Emakhazeni; Emalahleni; Emfuleni; Endumeni; Ephraim Mogale; Fetakgomo; Gamagara; Ga-Segonyana; George; Govan Mbeki; Great Kei; Greater Giyani; Greater Kokstad; Greater Letaba; Greater Taung; Greater Tzaneen; Hantam; Hessequa; Impendle; Intsika Yethu; Inxuba Yethemba; Joe Morolong; Jozini; Kamiesberg; Kannaland; Kareeberg; Karoo Hoogland; Kgatelopele; Kgetlengrivier; Khai-Ma; King Sabata Dalindyebo; Knysna; Kopanong; Kouga; Kou-Kamma; KwaDukuza; Laingsburg; Langeberg; Lekwa; Lekwa-Teemane; Lepelle-Nkumpi; Lephalale; Lesedi; Letsemeng; Madibeng; Mafikeng; Mafube; Magareng; Makana; Makhado; Makhuduthamaga; Maluti-a-Phofung; Mamusa; Mandeni; Mantsopa; Maphumulo; Maquassi Hills; Maruleng; Masilonyana; Matatiele; Matjhabeng; Matzikama; Mbhashe; Mbombela; Merafong City; Metsimaholo; Mfolozi; Mhlontlo; Midvaal; Mkhambathini; Mkhondo; Mnquma; Modimolle; Mogalakwena; Mogale City; Mohokare; Molemole; Moqhaka; Moretele; Moses Kotane; Mossel Bay; Mpofana; Msinga; Msukaligwa; Msunduzi; Mthonjaneni; Mtubatuba; Musina; Nala; Naledi; Nama Khoi; Ndlambe; Ndwedwe; Nelson Mandela Bay; Newcastle; Ngqushwa; Ngwathe; Nkandla; Nketoana; Nkomazi; Nkonkobe; Nongoma; Nquthu; Ntabankulu; Nxuba; Nyandeni; Okhahlamba; Oudtshoorn; Overstrand; Phokwane; Phumelela; Pixley Ka Seme; Polokwane; Port St Johns; Prince Albert; Ramotshere Moiloa; Rand West City; Ratlou; Ray Nkonyeni; Raymond Mhlaba; Renosterberg; Richmond; Richtersveld; Rustenburg; Sakhisizwe; Saldanha Bay; Senqu; Setsoto; Siyancuma; Siyathemba; Sol Plaatje; Stellenbosch; Steve Tshwete; Sundays River Valley; Swartland; Swellendam; Thaba Chweu; Thabazimbi; The Big 5 False Bay; Theewaterskloof; Thembelihle; Thembisile Hani; Thulamela; Tlokwe City Council; Tokologo; Tsantsabane; Tswaing; Tswelopele; Tubatse Fetakgomo; Ubuhlebezwe; Ubuntu; Ulundi; Umdoni; Umhlabuyalingana; uMhlathuze; Umjindi; uMlalazi; uMngeni; uMshwathi; Umsobomvu; uMuziwabantu; Umvoti; Umzimkhulu; Umzimvubu; Umzumbe; uPhongolo; Victor Khanye; Walter Sisulu; Witzenberg

Source: Authors' compilation.

econometric techniques that address issues such as endogeneity, heterogeneity, and cross-sectional dependence.

4.2 | Panel Unit Root Test, Johansen–Fisher Cointegration and Optimum Lag Length Selection Results Analysis

The panel unit root test results (see Table 4) for LLC and IPS indicate that, at a 1% significance level, our variables are generally stationary at first difference, except for LLFISAUT in the LLC test. This suggests that the variables have a mixed order of integration, namely $I(0)$ and $I(1)$, thereby supporting the use of further econometric tests, such as the Johansen–Fisher panel cointegration test. Before performing the Johansen–Fisher panel cointegration test, we determined the optimal lag length. Table 5 shows the lag selection criteria, all of which indicate an optimal lag length of 5. Therefore, we adopted this lag length to ensure that our model is not overfitted. The Johansen–Fisher cointegration test results in Table 6 show that both the trace and maximum eigenvalue tests reveal five cointegrating vectors. This confirms a strong long-run equilibrium relationship among the variables, as evidenced by the significant p values that led to the rejection of the null hypothesis of no cointegration.

TABLE 3 | Descriptive statistics results.

	LGVA	LLFISAUT	LGFCF	LHUMC	LLBR	LTRD	FCATE_A	FCATE_B	FCATE_C
Mean	8.691033	−1.029615	7.116480	11.71035	10.56712	2.266474	−0.024533	−0.999945	−0.005137
Median	8.409927	−0.767571	6.854913	11.65964	10.38662	2.046714	0.000000	−0.766195	0.000000
Maximum	13.25342	0.662962	11.48381	15.49921	14.82052	6.162000	0.000000	0.662962	0.000000
Minimum	5.740690	−5.314991	4.219905	8.925584	7.897346	−1.934708	−1.126854	−5.314991	−3.385132
Std. dev.	1.421520	0.785807	1.419677	1.199579	1.251449	0.857311	0.110341	0.808220	0.108226
Skewness	0.858304	−1.441542	0.850103	0.475062	0.855314	0.848193	−4.836066	−1.321335	−26.66740
Kurtosis	3.973771	4.921730	3.680779	3.906489	4.447423	8.720903	27.78765	4.669826	743.9522
Jarque–Bera	371.4830	1144.998	319.9032	164.4702	478.9046	3395.966	67523.36	932.0069	52,633,146
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Observations	2289	2289	2289	2289	2289	2289	2289	2289	2289

Source: Author's computations.

4.3 | Analysis and Discussion of Pooled OLS, FEs, D-K Cross-Sectional Dependence, and s-GMM Test Results

To validate the econometric models used, we performed both pre- and post-estimation tests. The results in Table 7 support the estimation techniques applied in Table 8. Notably, the Hausman test results in Table 7 indicate that the random effects model was rejected at the 1% significance level for all three categories of municipalities (metro, district, and local), as well as for the full sample. The null hypotheses for the Breusch–Pagan multiplier test, Wooldridge autocorrelation test, and modified Wald test are all rejected at the 1% significance level, indicating the presence of cross-sectional dependency, autocorrelation, and groupwise heteroskedasticity in the estimated models. As a result, the static panel models are preferred over the pooled ordinary least squares (P-OLS) approach because of these issues (refer to Table 7). As the D-K cross-sectional dependency and s-GMM models address these econometric issues in our panel data, our inferences primarily rely on these two models.

The diagnostic tests for the s-GMM indicate that although the AR(1) test reveals significant first-order autocorrelation in the differenced residuals, the AR(2) test confirms the absence of second-order autocorrelation. This is a requirement for the validity of the GMM estimates, ensuring that the model is appropriately specified. The Sargan and Hansen test results generally support the validity of the instruments used in the GMM estimation.

LLFISAUT (log of fiscal autonomy) serves as the main variable of interest, representing the level of fiscal autonomy at the municipal level. In the D-K model results for the full sample, the coefficient for LLFISAUT is positive and significant at the 10% level (0.004). This suggests that a 1% increase in fiscal autonomy leads to a modest but statistically significant positive effect of 0.004% on LED. A similar positive effect of 0.209% on LED was observed for Metro municipalities (Category A). However, for Category C and B municipalities (district and local municipalities), the coefficients are negative and significant, suggesting that a 1% increase in fiscal autonomy leads to a 0.012% and 0.128% decrease in LED, respectively.

The s-GMM model results provide insights into the impact of fiscal autonomy on LED across different categories of municipalities in South Africa. The s-GMM model results for the full sample show a significantly larger coefficient for fiscal autonomy (0.041) compared with the D-K standard error or cross-sectional dependency test results, indicating a strong positive impact of fiscal autonomy on LED after accounting for potential endogeneity. This means a 1% increase in fiscal autonomy leads to a 0.041% increase in LED. For metro municipalities (Category A), the negative coefficient (−0.848, significant at 1%) suggests that increased fiscal autonomy adversely affects LED. This negative impact may indicate systemic inefficiencies or fiscal mismanagement associated with high levels of fiscal autonomy, resulting in suboptimal resource allocation. As outlined in the Leviathan theory by Brennan and Buchanan (1980), increased autonomy may cause local governments to prioritize their own interests (e.g., expanding

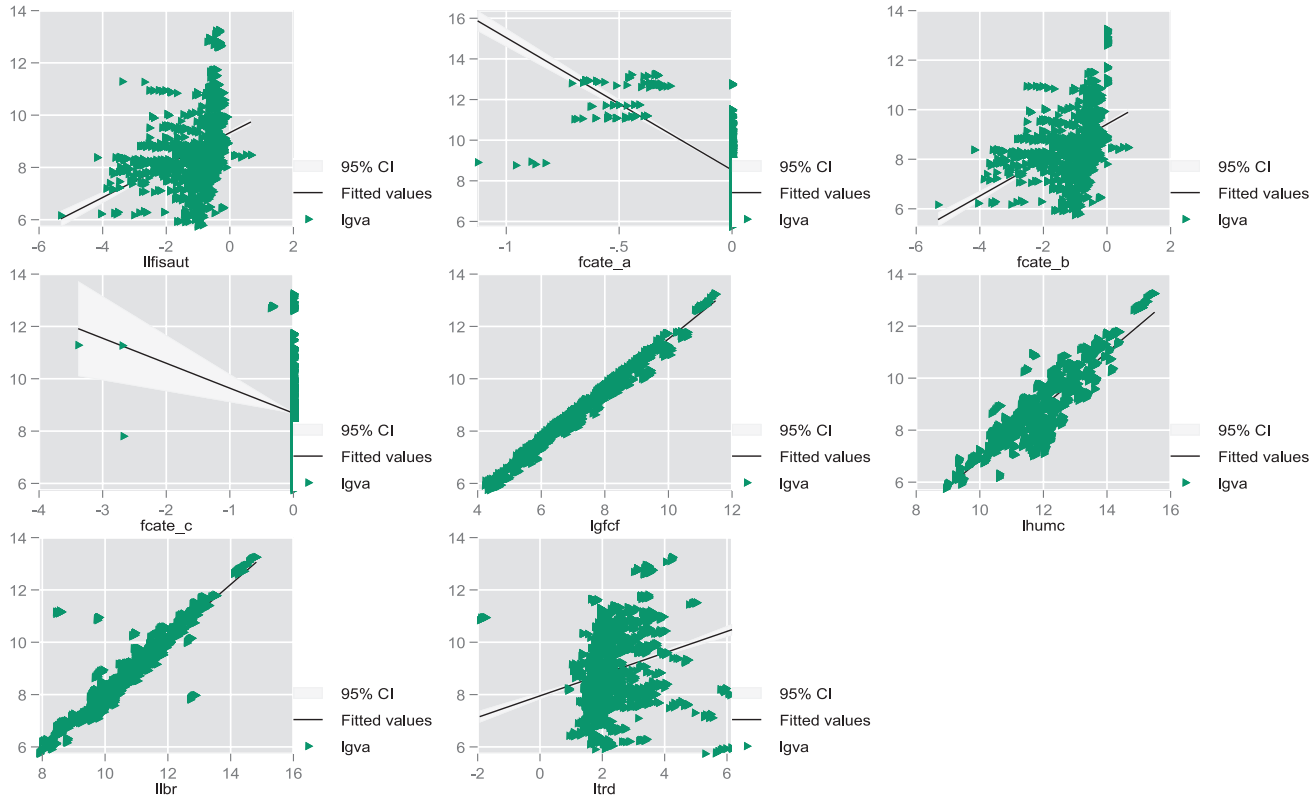

FIGURE 1 | Scatter plot between local economic development and the expalnatory variables.

bureaucracies, engaging in excessive spending, or responding to elite capture) rather than serving the broader needs of constituents. This finding aligns with Prud'homme (1995), who argued that fiscal decentralization might not always yield efficient outcomes, especially in large urban settings with complex administrative structures. In large metropolitan municipalities, these inefficiencies may be compounded by the scale and complexity of service delivery, overlapping institutional mandates, fragmented accountability mechanisms, and often weak intergovernmental coordination. In addition, metropolitan municipalities face high costs, infrastructure gaps, and complex administrative demands. Limited revenue and weak intergovernmental transfers often create fiscal imbalances that hinder development. Heavy debt and political risks further disrupt planning and implementation, undermining the expected benefits of decentralization in large urban systems.

For district (Category C) and local (Category B) municipalities, fiscal autonomy has a positive and significant impact on LED, with a 1% increase resulting in 0.063% and 6.754% growth, respectively, both significant at the 5% level. The findings on district municipalities from the s-GMM results support the idea that district-level governments are perhaps better suited to efficiently manage local resources, as they operate at an intermediate level that balances central oversight and local knowledge, which aligns with findings by Faguet (2004) in studies on Bolivia's fiscal decentralization. The large positive coefficient for local municipalities supports the view that smaller municipalities, being closer to residents and their needs, can effectively leverage fiscal autonomy to promote LED, as emphasized by Oates (1993), Bird and Vaillancourt (1998), Smoke (2001), and Shah (2003, 2004), Gadenne and Singhal (2014), Rondinelli (2017), Hanif et al. (2020). This substantial impact suggests that local municipalities are efficiently utilizing revenue from property rates and service charges to stimulate grassroots-level economic activities. Overall, smaller municipalities may benefit from having clearer, more targeted spending priorities and fewer governance layers, making it easier for them to directly link increased revenues to improved local services and infrastructure. This creates a more immediate positive impact on LED in these jurisdictions.

The positive impact of fiscal autonomy on LED, particularly in district and local municipalities, aligns with Oates' decentralization theory, which suggests that local governments are more responsive to their constituents needs and can allocate resources more efficiently. This also supports Tiebout's (1956) hypothesis that fiscal autonomy enables municipalities to act like “firms,” competing for residents and businesses by providing better services, thereby fostering economic development. The significant positive coefficients in Categories B and C are consistent with this hypothesis.

4.4 | MMQ-BR and PPQR-FE: Analysis and Discussion

The estimated models above may inadequately capture the heterogeneous distribution of panel data, potentially leading to biased estimates when fiscal autonomy's elasticity

TABLE 4 | Panel unit root test results.

Series	Model	Levels	First difference
LGVA	LLC	−54.6599*** (0.0000)	−120.693*** (0.0000)
	IPS	−16.1355*** (0.0000)	−44.3532*** (0.0000)
LLFISAUT	LLC	−15.5353*** (0.0000)	270.503 (1.0000)
	IPS	−539.000*** (0.0000)	−1.1E+15*** (0.0000)
LGFCF	LLC	−31.9424*** (0.0000)	−68.5428*** (0.0000)
	IPS	−9.84788*** (0.0000)	−47.8537*** (0.0000)
LHUMC	LLC	−57.9532*** (0.0000)	−121.370*** (0.0000)
	IPS	−9.44099 *** (0.0000)	−40.0086*** (0.0000)
LLBR	LLC	−30.0076*** (0.0000)	−79.2326*** (0.0000)
	IPS	−1.58535** (0.0564)	−42.5302*** (0.0000)
LTRD	LLC	−80.8500*** (0.0000)	−76.3960*** (0.0000)
	IPS	−34.8039 *** (0.0000)	−53.6090*** (0.0000)

Note: Null: unit root (assumes common unit root process); Levin, Lin, and Chu (t^*). Null: unit root (assumes individual unit root process); Im, Pesaran, and Shin (W-stat). ***$p < 0.01$, **$p < 0.05$, and *$p < 0.1$ are significance levels, respectively.
Source: Author's computations.

TABLE 5 | Optimum lag length selection results.

Lag	FPE	AIC	SIC	HQIC
0	0.000259	8.767786	8.793322	8.777407
1	1.41e-14	−14.86748	−14.68873	−14.80014
2	1.09e-14	−15.12343	−14.79147	−14.99836
3	8.20e-15	−15.40706	−14.92188	−15.22426
4	4.61e-15	−15.98395	−15.34555	−15.74342
5	3.15e-15*	−16.36567*	−15.57405*	−16.06741*

Note: AIC is Akaike information criterion; SIC is Schwarz information criterion; Hannan–Quinn information criterion; FPE, final prediction error.
*Lag order selected by the criterion.
Source: Author's computations.

varies significantly across different points of the LED variable (Alvarado et al. 2021). This may require nuanced analysis that recognizes that municipalities with different economic profiles might respond differently to fiscal autonomy. To address this, the Methods of MMQ-BR and PPQR-FE techniques was applied to analyze the asymmetric and non-linear effects of fiscal autonomy and other explanatory variables on LED across quantiles. To justify MMQ-BR and PPQR-FE's use, we conducted Swamey's test, Shapiro–Wilk W test and skewness–kurtosis test to assess slope homogeneity and normality (see Pesaran and Yamagata 2008; Royston 1983, 1992; D'Agostino et al. 1990). The results confirm slope heterogeneity and non-normality, as all tests were rejected at the 1% significance level, meeting the MMQ-BR and PPQR-FE prerequisites (Fuinhas and Marques 2019) (see Table 9 and Figure 2).

We focus on the main explanatory variable of interest, that is fiscal autonomy (*LLFISAUT*), using two approaches: *OLS* and *Method of MMQ-BR* for the full sample of municipalities in South Africa. A preliminary observation of the findings shows that the use of the *MMQ-BR* approach is justified, as the *MMQ-BR* estimates differ from the OLS estimates across the conditional distribution of the outcome variable, notably in terms of significance, signs, and coefficient magnitude.

Starting with Panel A in Table 10, the OLS results show that the coefficient for fiscal autonomy (LLFISAUT) is positive and statistically significant with LED at the 1% level. This indicates that, on average, a 1% increase in fiscal autonomy results in approximately a 0.085% increase in LED across all municipalities. For the MMQ-BR results at the 0.05th, 0.10th, 0.25th, 0.50th, 0.75th, 0.90th, and 0.95th percentiles of LED, the coefficients for fiscal autonomy are 0.124, 0.109, 0.080, 0.063, 0.077, 0.051, 0.046, and 0.046, respectively, all statistically significant at the 1% level. The results suggest that fiscal autonomy positively influences LED across all levels of municipalities. However, its impact decreases as we move toward the higher percentiles. This aligns with the fiscal decentralization theory, which posits that greater fiscal autonomy allows municipalities to allocate resources more efficiently to address local needs (Oates 1972). In the early stages of development, municipalities with greater fiscal autonomy can effectively fund essential services and infrastructure, driving LED. However, as municipalities develop, the marginal benefit of fiscal autonomy reduces because they might have already addressed critical developmental needs. For the full sample, this relationship is supported by empirical studies, including those by Meloche et al. (2004), Hughes Hallett (2017), Didik et al. (2018), Sanggrangbano et al. (2024), and Linawati and Solikin (2024).

In Panel B of Table 10, the OLS model shows that fiscal autonomy has a negative coefficient, −0.165, at the 1% significance level ($p < 0.01$), indicating that a 1% increase in fiscal autonomy for metro municipalities (Category A) results in a 0.165% decrease in LED. This suggests fiscal autonomy might hinder metro-level development, possibly due to inefficiencies in revenue management as mentioned in the sub-section above. In the MMQ-BR model, fiscal autonomy's negative impact decreases across quantiles (from −0.155 at 0.05 to −0.072 at 0.95). This could imply that municipalities with less developed economies struggle more with managing increased fiscal autonomy, potentially due to inadequate fiscal management systems or weak governance structures (Rodríguez-Pose and Ezcurra 2011). Conversely, the diminishing negative effect at higher quantiles indicates that more developed metros might be better equipped to handle fiscal autonomy, as they likely possess more robust institutions and financial management capabilities in South Africa. This finding

TABLE 6 | Johansen–Fisher panel cointegration test results.

Trace test					Maximum eigenvalue test				
H_0	H_1	λ-trace statistic	0.05 critical value	p	H_0	H_1	λ-max statistic	0.05 critical value	p
$r = 0$	$r \geq 1$	207.4497*	95.75366	0.0000	$r = 0$	$r \geq 1$	106.4159*	40.07757	0.0000
$r \leq 1$	$r \geq 2$	101.0338*	69.81889	0.0000	$r \leq 1$	$r \geq 2$	59.18988*	33.87687	0.0000
$r \leq 2$	$r \geq 3$	41.84396	47.85613	0.1631	$r \leq 2$	$r \geq 3$	33.71796*	27.58434	0.0072
$r = 3$	$r \geq 4$	8.126006	29.79707	0.9965	$r = 3$	$r \geq 4$	5.696432	21.13162	0.9882
$r \leq 4$	$r \geq 5$	2.429573	15.49471	0.9868	$r \leq 4$	$r \geq 5$	1.987479	14.26460	0.9910
$r \leq 5$	$r \geq 6$	0.442094	3.841465	0.5061	$r \leq 5$	$r \geq 6$	0.442094	3.841465	0.5061

Note: Probabilities are computed using the asymptotic chi-square distribution.
*Rejection of the null hypothesis of no cointegration at least at the 10% level of significance.
Source: Author's computations.

TABLE 7 | Pre- and post-test results.

	(1)	(2)	(3)	(4)
	Full Sample	Cate_A	Cate_C	Cate_B
Breusch & Pagan Lagrangian multiplier test				
Statistics	$Chi^2(1) = 16.86$***	$Chi^2(1) = 10.29$**	$Chi^2(1) = 14.83$***	$Chi^2(1) = 7.96$***
Wooldridge test				
Statistics	$F(1, 164) = 163.064$***	$F(1, 164) = 159.884$***	$F(1, 164) = 163.062$ ***	$F(1, 164) = 160.855$***
Modified Wald test for groupwise heteroskedasticity				
Statistics	$Chi^2(187) = 7.0e+26$***	$Chi^2(187) = 1.0e+31$***	$Chi^2(187) = 4.4e+28$***	$Chi^2(187) = 9.6e+30$***
Hausman test				
Statistics	$Chi^2(5) = 811.97$***	$Chi^2(5) = 820.73$***	$Chi^2(5) = 807.86$***	$Chi^2(5) = 808.61$***

Note: *, **, *** denote the level of significance at 10%, 5%, 1%, respectively. Cate_A, Cate_B, and Cate_C represent the pre- and post-test results for municipalities in Category A, Category B, and Category C, respectively.

is consistent with empirical studies by Rodríguez-Pose and Ezcurra (2011) and Ivanyna and Shah (2012), who found that fiscal autonomy does not always translate into positive economic outcomes in regions with weaker governance structures or administrative inefficiencies. On the other hand, the findings also partially align with studies such as Faguet (2004) and Martinez-Vazquez and McNab (2003), which argue that the benefits of fiscal decentralization and autonomy can vary significantly across different localities, with better outcomes observed in regions with stronger institutional frameworks.

In Panel C of Table 10, the OLS results indicate that the coefficient for FCATE_C is −0.040, showing a negative but statistically insignificant effect of fiscal autonomy on LED for district municipalities. In the MMQ-BR model, fiscal autonomy's impact on LED remains statistically insignificant across the quantiles. This suggests fiscal autonomy may not enhance LED at lower and higher economic development levels. As identified in the literature, inefficiencies, weak revenue collection, or limited administrative capacity might hinder its effectiveness in district municipalities (Oates 2004; Rodríguez-Pose and Ezcurra 2011; Martinez-Vazquez and McNab 2003). The results for district municipalities challenge the traditional view of fiscal decentralization, which suggests that decentralizing fiscal responsibilities enhances resource allocation and economic outcomes (Oates 1999; Rodden 2004; Qiao et al. 2008; Bird 2011). The lack of significant findings implies that fiscal autonomy has not fully translated into economic development, possibly due to the following factors: Districts have limited revenue-generating power, relying heavily on transfers, which weakens the impact of fiscal autonomy (Keefer and Knack 1997; Slemrod and Yitzhaki 2002; Manuel and Erasmus 2024). Overlaps with local municipalities cause inefficiencies, and rural districts often struggle with administrative capacity, making resource management difficult (Manuel and Erasmus 2024). These factors suggest that fiscal autonomy alone is not enough—improving coordination and building capacity are essential to enhance LED in district contexts (Manuel and Erasmus 2024).

In Panel D of Table 10, the OLS result indicates a positive and significant relationship between fiscal autonomy in local municipalities and LED. The coefficient of 0.103 suggests that a 1% increase in fiscal autonomy leads to a 0.103% increase in LED. This result is statistically significant at the 5% level. In

TABLE 8 | P-OLS, FE Model, Driscoll–Kraay (D-K), and s-GMM model results.

POLS model					FE model			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	**Full Sample**	**Cate_A**	**Cate_B**	**Cate_C**	**Full Sample**	**Cate_A**	**Cate_B**	**Cate_C**
LLFISAUT	0.020***	0.019***	0.142***	0.020***	0.004	0.003	0.130***	0.004
	(0.003)	(0.003)	(0.024)	(0.003)	(0.003)	(0.003)	(0.030)	(0.003)
LGFCF	0.373***	0.369***	0.369***	0.372***	0.246***	0.240***	0.242***	0.246***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)
LHUMC	0.415***	0.392***	0.388***	0.409***	0.594***	0.545***	0.565***	0.594***
	(0.016)	(0.017)	(0.017)	(0.016)	(0.017)	(0.019)	(0.019)	(0.017)
LLBR	0.321***	0.330***	0.338***	0.328***	0.294***	0.316***	0.307***	0.294***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.017)	(0.016)	(0.016)
LTRD	−0.001	−0.003	−0.002	−0.001	−0.002	−0.002	−0.002	−0.002
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
FCATE_A		0.156***				0.209***		
		(0.034)				(0.037)		
FCATE_B			−0.123***				−0.128***	
			(0.024)				(0.030)	
FCATE_C				0.092***				−0.012
				(0.033)				(0.049)
Constant	−2.206***	−1.997***	−2.039***	−2.205***	−3.119***	−2.725***	−2.880***	−3.119***
	(0.070)	(0.083)	(0.076)	(0.070)	(0.066)	(0.096)	(0.086)	(0.066)
R^2	0.97	0.98	0.98	0.98	0.92	0.92	0.92	0.92
Wald $chi^2(5)$	75532.59***	76213.30***	76399.84***	75745.77***	19164.53***	16206.52***	16105.73***	15963.27***
Observations	2289	2289	2289	2289	2289	2289	2289	2289

(Continues)

TABLE 8 | (Continued)

	Driscoll–Kraay (D-K) Model				s-GMM Model			
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Full Sample	Cate_A	Cate_B	Cate_C	Full Sample	Cate_A	Cate_B	Cate_C
LGVA (−1)					−0.090***	−0.024**	−0.102**	−0.097**
					(0.026)	(0.011)	(0.049)	(0.048)
LLFISAUT	0.004**	0.003	0.130***	0.004**	0.041**	0.737***	−6.683***	−0.124***
	(0.002)	(0.002)	(0.042)	(0.002)	(0.019)	(0.088)	(2.011)	(0.032)
LGFCF	0.246***	0.240***	0.242***	0.246***	0.215***	0.130**	0.250***	0.248***
	(0.040)	(0.041)	(0.041)	(0.040)	(0.042)	(0.054)	(0.047)	(0.055)
LHUMC	0.594***	0.545***	0.565***	0.594***	0.751***	1.736***	−0.035	0.356***
	(0.063)	(0.058)	(0.057)	(0.063)	(0.092)	(0.252)	(0.148)	(0.101)
LLBR	0.294***	0.316***	0.307***	0.294***	0.371***	−0.726***	0.744***	0.545***
	(0.040)	(0.039)	(0.040)	(0.040)	(0.070)	(0.227)	(0.078)	(0.095)
LTRD	−0.002	−0.002	−0.002	−0.002	0.045	0.066	0.082	0.034
	(0.002)	(0.002)	(0.002)	(0.002)	(0.066)	(0.092)	(0.051)	(0.059)
FCATE_A		0.209***				−0.848***		
		(0.041)				(0.168)		
FCATE_B			−0.128**				6.754***	
			(0.043)				(2.001)	
FCATE_C				−0.012**				0.063**
				(0.005)				(0.030)
Constant	−3.119***	−2.725***	−2.880***	−3.119***	−4.795***	−4.100***	0.060	−2.126***
	(0.269)	(0.214)	(0.196)	(0.269)	(0.575)	(0.406)	(1.194)	(0.444)
R^2	0.9786	0.9789	0.9788	0.9786				
Wald $chi^2(5)$	14945.50***	19108.49***	13887.91***	12534.00***				
Observations	2289	2289	2289	2289	2144	2003	2003	2003

(Continues)

TABLE 8 | (Continued)

Diagnostic test results for s-GMM				
AR(1)	−1.72	−3.91	−1.55	−3.96
p value	(0.086)	(0.000)	(0.122)	(0.000)
AR(2)	−2.03	−2.52	−2.26	−1.97
p value	(0.142)	(0.112)	(0.124)	(0.149)
Sargan OIR	15.95	0.19	13.52	22.15
p value	(0.101)	(1.000)	(0.141)	(0.138)
Hansen OIR	22.21	4.56	14.16	11.14
p value	(0.014)	(0.919)	(0.117)	(0.801)
DHT for instruments				
(a) Instruments in levels				
Hansen excluding group	17.20	6.64	11.49	8.52
p value	(0.046)	(0.675)	(0.175)	(0.861)
Diff (null, H = exogenous)	5.01	−2.08	2.66	2.62
p value	(0.025)	(1.000)	(0.103)	(0.269)
(b) GMM instruments for IV				
Hansen excluding group	17.13	3.74	7.13	9.39
p value	(0.047)	(0.880)	(0.415)	(0.805)
Diff (null, H = exogenous)	5.08	0.81	7.02	1.76
p value	(0.024)	(0.666)	(0.130)	(0.416)
Fisher	9930.87***	13285.09***	35751.25***	5.19e+08 ***
Instruments	17	18	17	24

Note: ***, **, *: significance levels at 1%, 5%, and 10% respectively. Standard errors in parentheses. The dependent variable is gross value added at basic prices, a proxy for local economic development. The significance of bold values holds two key implications. First, it relates to the significance of estimated coefficients and the Fisher statistics. Second, it signifies the non-rejection of null hypotheses, specifically (a) the absence of autocorrelation in the AR(2) tests and (b) the validity of the instruments in the Sargan OIR test. Cate_A, Cate_B, and Cate_C represent.

Abbreviations: DHT, difference in Hansen test for exogeneity of instruments subsets; Diff, difference; OIR, over-identifying restrictions test.

Source: Author's computations.

TABLE 9 | Shapiro–Wilk *W*, slope homogeneity, and skewness–kurtosis test results.

Variable	Obs	*W*	*V*	*z*	Prob > *z*
Panel A: Shapiro–Wilk *W* test					
LGVA	3705	0.97697	47.728	10.046	0.00000
LLFISAUT	2289	0.85885	189.246	13.402	0.00000
LGFCF	3705	0.97374	54.418	10.387	0.00000
LHUMC	3705	0.99299	14.533	6.956	0.00000
LLBR	3705	0.97841	44.737	9.878	0.00000
LTRD	3705	0.83595	339.909	15.148	0.00000
Test statistics (delta)			**Value**		***p* value**
Panel B: slope homogeneity test					
Δ_{delt}			37.221***		0.000
$\Delta_{adj\ delt}$			48.053***		0.000
Variable					
Joint test	**Obs**	**Pr(skewness)**	**Pr(kurtosis)**	**Adj chi²(2)**	**Prob > chi²**
Panel C: skewness–kurtosis test					
LGVA	3705	0.0000	0.3636	123.83	0.0000
LLFISAUT	2289	0.0000	0.0000	441.54	0.0000
LGFCF	3705	0.0000	0.0936	128.87	0.0000
LHUMC	3705	0.0000	0.6509	16.78	0.0002
LLBR	3705	0.0000	0.0106	106.56	0.0000
LTRD	3705	0.0000	0.0000	780.51	0.0000

Note: ***, **, and * denote significance at 1%, 5%, and 10%, respectively.
Source: Author's computations.

the MMQ-BR model, the results reveal the positive and significant effects of fiscal autonomy at the higher quantiles (Qu 0.50, Qu 0.75, and Qu 0.90) suggesting that as local municipalities improve their economic performance, they collect higher revenues through property taxes and service fees, which they can reinvest in infrastructure and public services and thus the benefits of fiscal autonomy become more pronounced. This may be due to municipalities' commitment to building governance capacity and administrative resources to manage finances effectively and utilize fiscal autonomy for meaningful investments in infrastructure, public services, and local development. Although they may not have fully achieved optimal governance capacity, they are progressing toward using these resources more efficiently. Conversely, the insignificant results at the lower quantiles (Qu 0.05 and Qu 0.1) are likely largely due to weak economic activity, narrow tax bases, and governance challenges. As a result, despite having greater autonomy, these municipalities struggle to translate it into meaningful economic development.

Figures 3–6 present a visual representation of the regression results from Table 10, highlighting the impact of fiscal autonomy on LED for the full sample and the three categories of municipalities. These figures demonstrate how the coefficients of the main variables of interest vary across different quantiles in the regression, depending on the specific variables considered. Overall, the findings indicate that fiscal autonomy coefficients exhibit a positive impact on LED across different quantiles, although this impact appears to decline over time. The findings highlight the need for policy interventions that strengthen the fiscal management and revenue-generating capacity of district municipalities to harness the potential benefits of fiscal autonomy.

The results from PPQR-FE in Table 11 confirm the findings of the MMQ-BR approach in Table 10, demonstrating robustness. For the full sample, fiscal autonomy (LLFISAUT) remains positive and significant across most quantiles in both tables, though the magnitudes differ slightly. For metro municipalities (FCATE_A), both methods show negative and significant effects at multiple quantiles, reinforcing the adverse impact of fiscal autonomy on LED in this category. For local municipalities, fiscal autonomy (FCATE_B) yields mostly positive and significant results in both approaches, reinforcing its developmental role in local municipalities. Fiscal autonomy in district municipalities (FCATE_C) exhibits mixed effects, but alignment in low and high quantiles affirms moderate robustness. Overall, the consistency across methods enhances the reliability of findings and supports sound policy recommendations across municipal

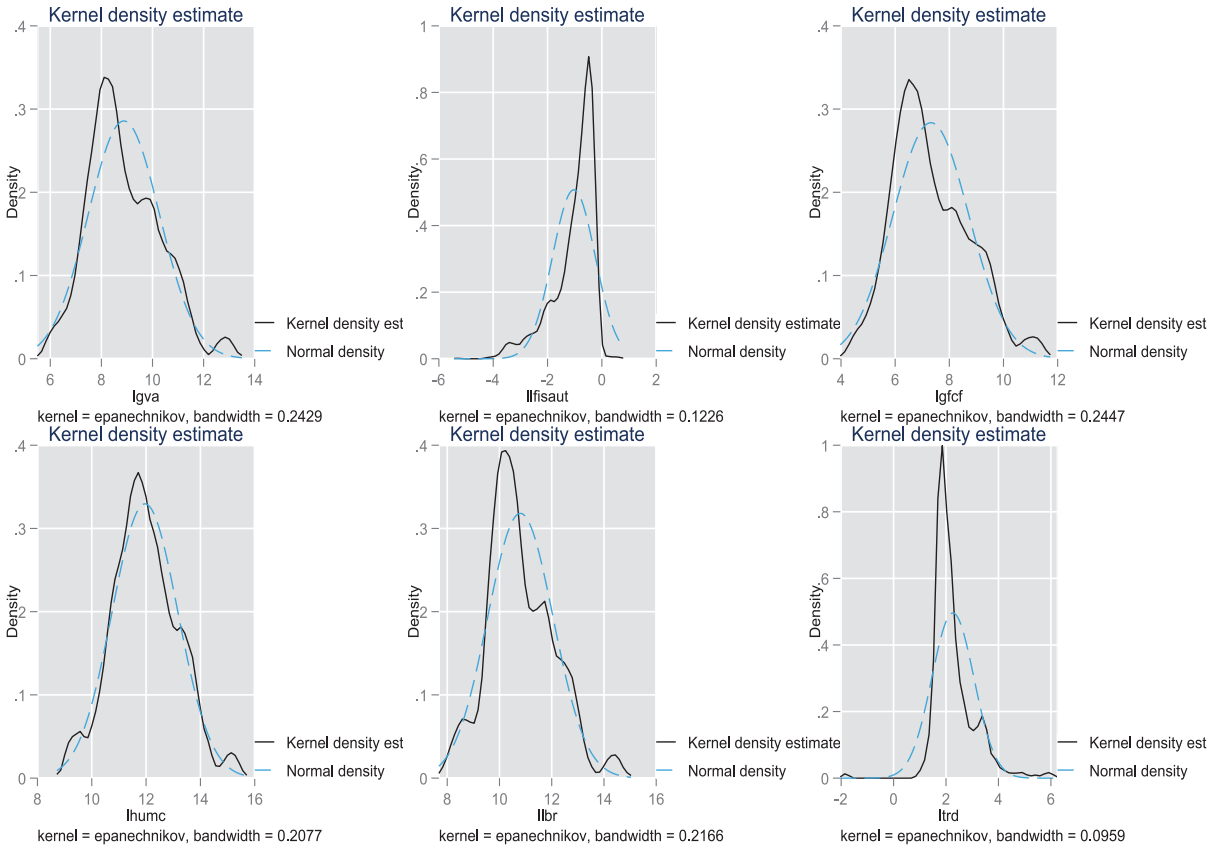

FIGURE 2 | Kernel and normal density estimates for the variables.

categories. The FEs in PPQR-FE further strengthen the reliability of these conclusions.

5 | Policy Implications

For the overall panel level, the results suggest that fiscal autonomy is a critical driver of LED in South Africa across different municipalities. However, the diminishing marginal impact at higher levels of development suggests the need for tailored policy interventions. In South Africa, policies should focus on interventions for advanced municipalities that have attained higher economic development levels, as the marginal impact of fiscal autonomy decreases. Although fiscal autonomy gives these municipalities more control over their revenue streams (e.g., through property taxes, local fees), it also increases their burden to address widespread urban challenges, like housing shortages, traffic congestion, and inequalities in service provision. They might be experiencing challenges in translating increased fiscal autonomy into effective spending due to bureaucratic inefficiencies, political constraints, or difficulties in coordinating different departments. They often struggle with governance issues, such as corruption, poor financial management, or inadequate planning, which can undermine the positive effects of fiscal decentralization.

The government should therefore tailor fiscal autonomy policies to the specific needs and capacities of different categories of municipalities to ensure the intended developmental benefits are realized. The policy should provide smaller municipalities with more flexibility in local revenue management while setting clearer governance and accountability frameworks for metros to manage their more complex service delivery needs (Sanggrangbano et al. 2024; Linawati and Solikin 2024).

Implementing performance-based fiscal autonomy grants to reward municipalities for meeting key developmental targets will significantly support these policies. This is because performance-based grants enhance fiscal autonomy's impact on LED by funding infrastructure, fostering innovation, and supporting sustainable local growth (Rodden 2002). Additionally, these grants should align with long-term development goals to promote efficient resource allocation. Furthermore, fostering partnerships between local governments and the private sector can enhance financing for innovative infrastructure projects (Linawati and Solikin 2024).

- Specifically, to enhance the effectiveness of fiscal autonomy in fostering LED, particularly in metro municipalities, it is recommended to strengthen governance frameworks by investing in financial management training and increasing transparency in budget allocation processes to ensure that revenues are efficiently utilized for high-impact development projects. Metros could also implement technology-driven revenue collection systems to reduce leakages and ensure that they can capture their full revenue potential, especially in property taxes and service fees.

TABLE 10 | OLS and method of moments quantile bootstrap regression (MMQ-BR) results.

Panel A: full sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS full sample	**MMQ-BR full sample**	**MMQ-BR full sample**	**MMQ-BR full sample**	**MMQ-BR full sample**	**MMQ-BR full sample**	**MMQ-BR full sample**	**MMQ-BR full sample**
Variables	**OLS**	**Qu 0.05**	**Qu 0.1**	**Qu 0.25**	**Qu 0.50**	**Qu 0.75**	**Qu 0.90**	**Qu 0.95**
LLFISAUT	0.085*** (0.007)	0.109*** (0.018)	0.080*** (0.010)	0.063*** (0.007)	0.077*** (0.009)	0.051*** (0.007)	0.046*** (0.007)	0.046*** (0.006)
LGFCF	0.769*** (0.008)	0.636*** (0.038)	0.630*** (0.017)	0.689*** (0.013)	0.767*** (0.024)	0.802*** (0.007)	0.833*** (0.009)	0.838*** (0.006)
LHUMC	0.197*** (0.013)	0.094 (0.060)	0.043 (0.029)	0.072*** (0.019)	0.170*** (0.026)	0.133*** (0.011)	0.136*** (0.016)	0.137*** (0.010)
LLBR	0.081*** (0.011)	0.316*** (0.098)	0.378*** (0.044)	0.297*** (0.030)	0.114** (0.045)	0.101*** (0.012)	0.062*** (0.017)	0.053*** (0.009)
LTRD	−0.006* (0.004)	−0.003 (0.006)	−0.000 (0.005)	−0.007** (0.003)	−0.014*** (0.004)	0.004 (0.007)	0.020*** (0.005)	0.016*** (0.004)
Constant	0.156*** (0.037)	−0.343** (0.137)	−0.353*** (0.062)	−0.199*** (0.042)	0.146 (0.099)	0.490*** (0.040)	0.672*** (0.058)	0.750*** (0.040)
R^2/pseudo R^2	0.9924	0.8896	0.8982	0.9021	0.9087	0.9251	0.9383	0.9448
Fisher	76929.24***							
Obs.	2289	2289	2289	2289	2289	2289	2289	2289

Panel B: metro municipalities (Category A)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		MMQ-BR Cate_A	**MMQ-BR Cate_A**	**MMQ-BR Cate_A**	**MMQ-BR Cate_A**	**MMQ-BR Cate_A**	**MMQ-BR Cate_A**	**MMQ-BR Cate_A**
Variables	**OLS Cate_A**	**Qu 0.05**	**Qu 0.1**	**Qu 0.25**	**Qu 0.50**	**Qu 0.75**	**Qu 0.90**	**Qu 0.95**
LLFISAUT	0.085*** (0.007)	0.113*** (0.018)	0.084*** (0.012)	0.065*** (0.008)	0.078*** (0.009)	0.054*** (0.007)	0.041*** (0.007)	0.044*** (0.006)
LGFCF	0.768*** (0.008)	0.653*** (0.040)	0.637*** (0.017)	0.681*** (0.015)	0.776*** (0.023)	0.801*** (0.008)	0.835*** (0.009)	0.838*** (0.005)
LHUMC	0.197*** (0.012)	0.129** (0.062)	0.050 (0.031)	0.075*** (0.019)	0.177*** (0.023)	0.133*** (0.011)	0.129*** (0.015)	0.135*** (0.010)
LLBR	0.075*** (0.011)	0.264** (0.104)	0.363*** (0.045)	0.292*** (0.031)	0.093** (0.040)	0.097*** (0.012)	0.059*** (0.016)	0.047*** (0.010)
LTRD	−0.007* (0.004)	0.000 (0.007)	0.001 (0.005)	−0.008** (0.003)	−0.015*** (0.004)	0.001 (0.006)	0.023*** (0.004)	0.016*** (0.005)
FCATE_A	−0.165*** (0.025)	−0.155* (0.088)	−0.183*** (0.062)	−0.166*** (0.033)	−0.089** (0.035)	−0.124*** (0.027)	−0.087*** (0.020)	−0.072*** (0.019)
Constant	0.226*** (0.038)	−0.336** (0.139)	−0.327*** (0.063)	−0.125** (0.051)	0.232** (0.099)	0.545*** (0.037)	0.757*** (0.051)	0.829*** (0.038)
R^2/pseudo R^2	0.9925	0.8908	0.8991	0.9030	0.9090	0.9256	0.9387	0.9451

(Continues)

TABLE 10 | (Continued)

Panel B: metro municipalities (Category A)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		MMQ-BR Cate_A	MMQ-BR Cate_A	MMQ-BR Cate_A	MMQ-BR Cate_A	MMQ-BR Cate_A	MMQ-BR Cate_A	MMQ-BR Cate_A
Variables	**OLS Cate_A**	**Qu 0.05**	**Qu 0.1**	**Qu 0.25**	**Qu 0.50**	**Qu 0.75**	**Qu 0.90**	**Qu 0.95**
Fisher	78724.99***							
Obs.	2289	2289	2289	2289	2289	2289	2289	2289

Panel C: district municipalities (Category C)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		MMQ-BR Cate_C	MMQ-BR Cate_C	MMQ-BR Cate_C	MMQ-BR Cate_C	MMQ-BR Cate_C	MMQ-BR Cate_C	MMQ-BR Cate_C
Variables	**OLS Cate_C**	**Qu 0.05**	**Qu 0.1**	**Qu 0.25**	**Qu 0.50**	**Qu 0.75**	**Qu 0.90**	**Qu 0.95**
LLFISAUT	0.086*** (0.007)	0.107*** (0.016)	0.076*** (0.008)	0.063*** (0.007)	0.078*** (0.008)	0.053*** (0.008)	0.045*** (0.008)	0.046*** (0.006)
LGFCF	0.769*** (0.008)	0.628*** (0.027)	0.625*** (0.013)	0.689*** (0.012)	0.768*** (0.023)	0.802*** (0.007)	0.833*** (0.009)	0.838*** (0.006)
LHUMC	0.199*** (0.013)	0.080 (0.049)	0.033* (0.018)	0.072*** (0.017)	0.171*** (0.023)	0.134*** (0.012)	0.135*** (0.018)	0.137*** (0.011)
LLBR	0.080*** (0.011)	0.337*** (0.073)	0.393*** (0.027)	0.297*** (0.027)	0.113*** (0.042)	0.101*** (0.012)	0.062*** (0.017)	0.053*** (0.011)
LTRD	−0.006* (0.004)	−0.005 (0.006)	−0.002 (0.005)	−0.007*** (0.003)	−0.014*** (0.004)	0.004 (0.007)	0.020*** (0.005)	0.016*** (0.004)
FCATE_C	−0.040 (0.038)	0.273 (0.234)	0.362 (0.235)	−0.061 (0.183)	−0.064 (0.071)	−0.020 (0.036)	0.004 (0.025)	0.010 (0.036)
Constant	0.156*** (0.037)	−0.341*** (0.103)	−0.359*** (0.056)	−0.199*** (0.041)	0.148 (0.096)	0.490*** (0.043)	0.674*** (0.058)	0.750*** (0.039)
R^2/pseudo R^2	0.9924	0.8915	0.8993	0.9021	0.9088	0.9252	0.9383	0.9448
Fisher	64575.22***							
Obs.	2289	2289	2289	2289	2289	2289	2289	2289

Panel D: local municipalities (Category B)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		MMQ-BR Cate_B	MMQ-BR Cate_B	MMQ-BR Cate_B	MMQ-BR Cate_B	MMQ-BR Cate_B	MMQ-BR Cate_B	MMQ-BR Cate_B
Variables	**OLS Cate_B**	**Qu 0.05**	**Qu 0.1**	**Qu 0.25**	**Qu 0.50**	**Qu 0.75**	**Qu 0.90**	**Qu 0.95**
LLFISAUT	−0.014 (0.031)	0.000 (0.158)	−0.016 (0.118)	−0.009 (0.038)	0.003 (0.026)	−0.064* (0.037)	−0.029 (0.027)	−0.014 (0.025)

(Continues)

TABLE 10 | (Continued)

Panel D: local municipalities (Category B)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		MMQ-BR Cate_B	MMQ-BR Cate_B	MMQ-BR Cate_B	MMQ-BR Cate_B	MMQ-BR Cate_B	MMQ-BR Cate_B	MMQ-BR Cate_B
Variables	**OLS Cate_B**	**Qu 0.05**	**Qu 0.1**	**Qu 0.25**	**Qu 0.50**	**Qu 0.75**	**Qu 0.90**	**Qu 0.95**
LGFCF	0.767*** (0.008)	0.642*** (0.033)	0.633*** (0.015)	0.685*** (0.014)	0.774*** (0.021)	0.798*** (0.008)	0.835*** (0.010)	0.837*** (0.006)
LHUMC	0.202*** (0.013)	0.106* (0.056)	0.047* (0.025)	0.077*** (0.020)	0.177*** (0.025)	0.136*** (0.011)	0.129*** (0.017)	0.136*** (0.011)
LLBR	0.073*** (0.011)	0.296*** (0.089)	0.371*** (0.036)	0.291*** (0.030)	0.095** (0.038)	0.096*** (0.013)	0.059*** (0.015)	0.048*** (0.010)
LTRD	−0.007** (0.004)	−0.004 (0.006)	0.001 (0.005)	−0.008*** (0.003)	−0.015*** (0.004)	0.001 (0.007)	0.023*** (0.005)	0.016*** (0.005)
FCATE_B	0.103*** (0.031)	0.111 (0.160)	0.098 (0.116)	0.074* (0.039)	0.075*** (0.027)	0.121*** (0.038)	0.070*** (0.024)	0.059** (0.024)
Constant	0.201*** (0.038)	−0.307** (0.123)	−0.350*** (0.057)	−0.164*** (0.051)	0.216** (0.090)	0.552*** (0.042)	0.756*** (0.064)	0.812*** (0.050)
R^2/pseudo R^2	0.9925	0.8898	0.8987	0.9028	0.9092	0.9256	0.9386	0.9451
Fisher	71587.94***							
Obs.	2289	2289	2289	2289	2289	2289	2289	2289

Note: ***, **, and * denote significance at 1%, 5% and 10%, respectively. Robust standard errors in parentheses. The dependent variable is gross value added at basic prices, a proxy for local economic development (LED). Qu 0.05, Qu 0.1, Qu 0.25, Qu 0.50, Qu 0.75, Qu 0.90, and Qu 0.95 represent quantile regression 0.05, 0.10, 0.25, 0.50, 0.75, 0.90, and 0.95 percentiles, respectively.
Source: Author's computations.

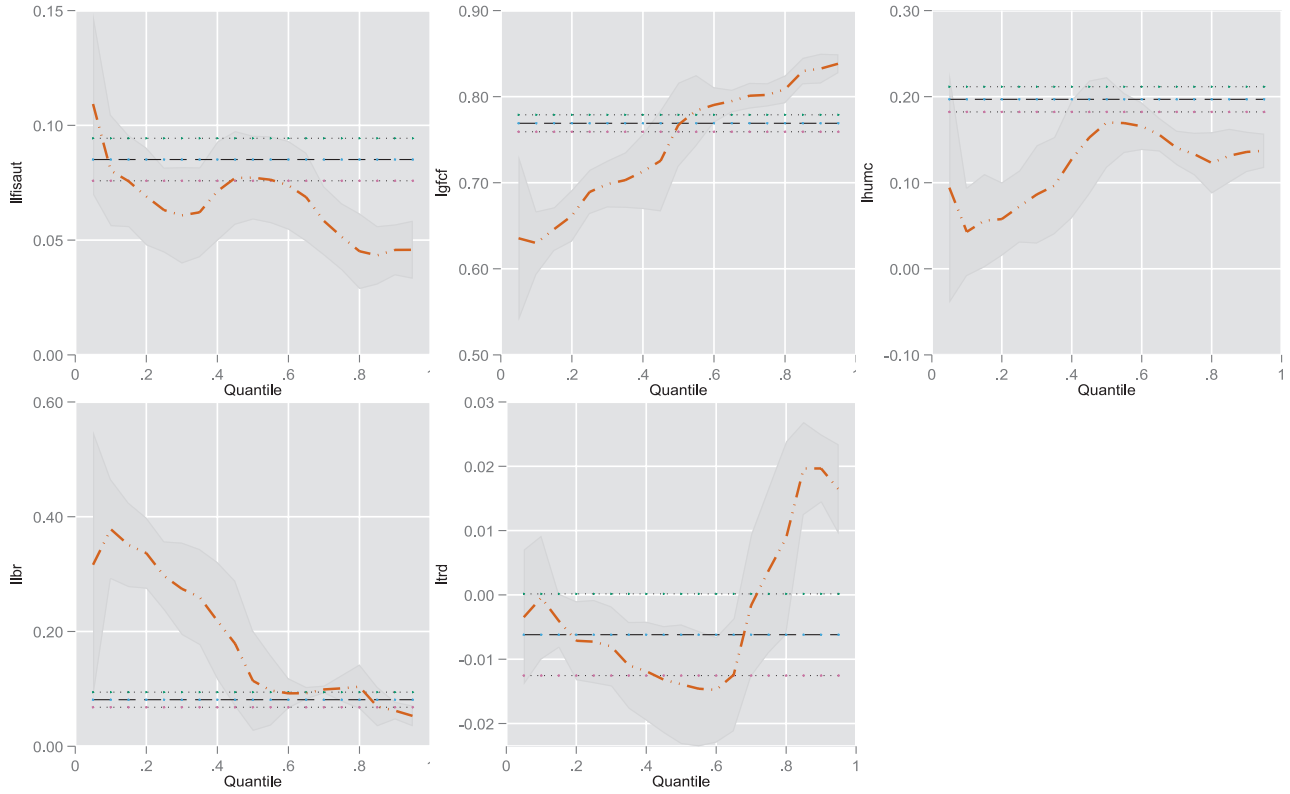

FIGURE 3 | Coefficients changes in quantile regression for the full sample.

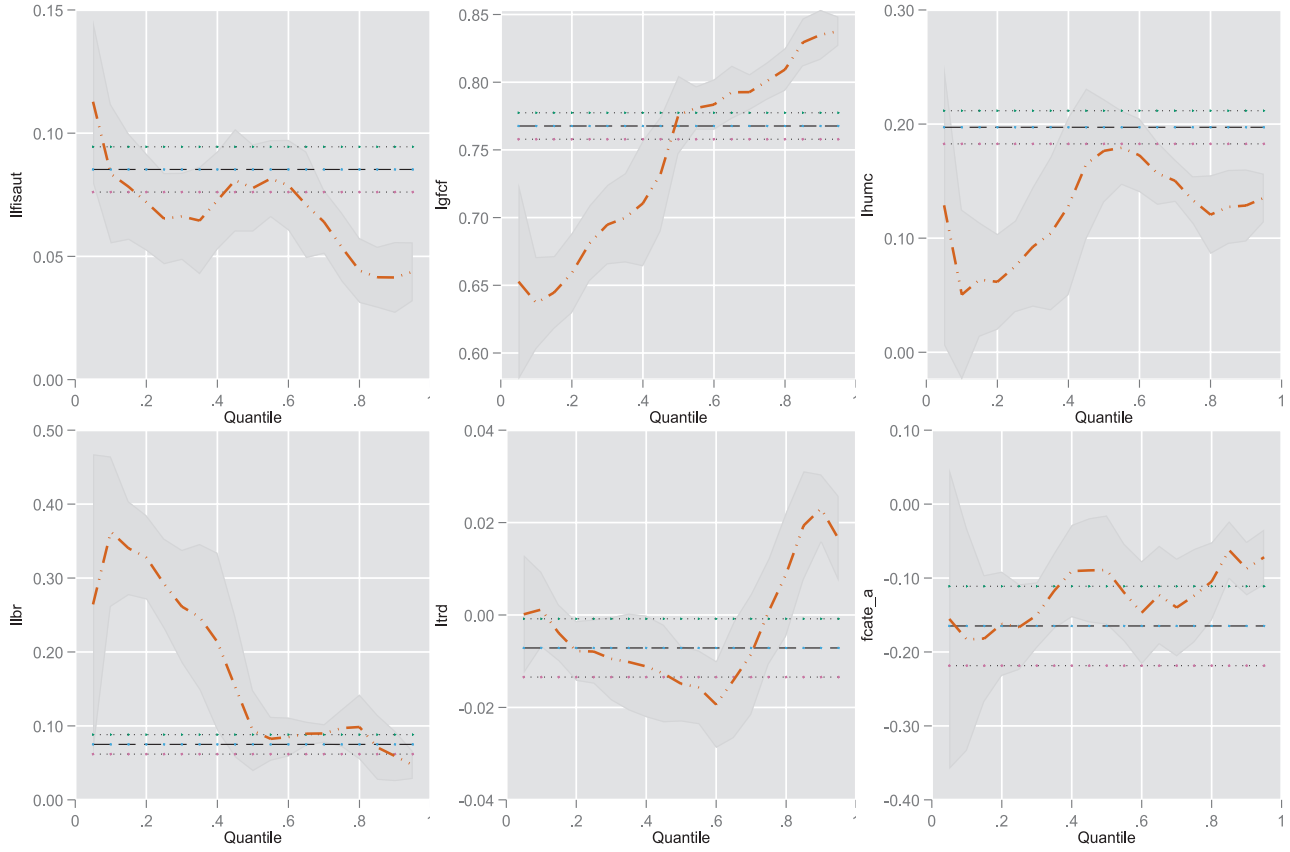

FIGURE 4 | Coefficients changes in quantile regression for Category A municipality.

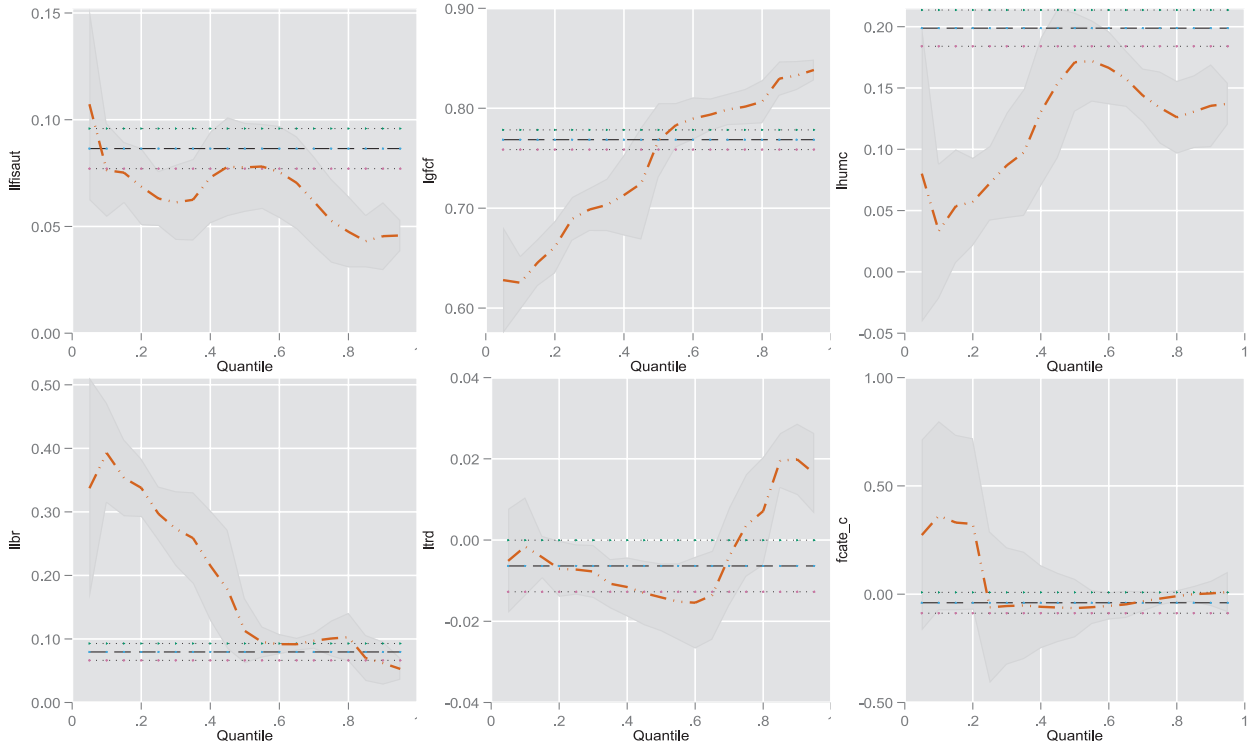

FIGURE 5 | Coefficients changes in quantile regression for Category C municipality.

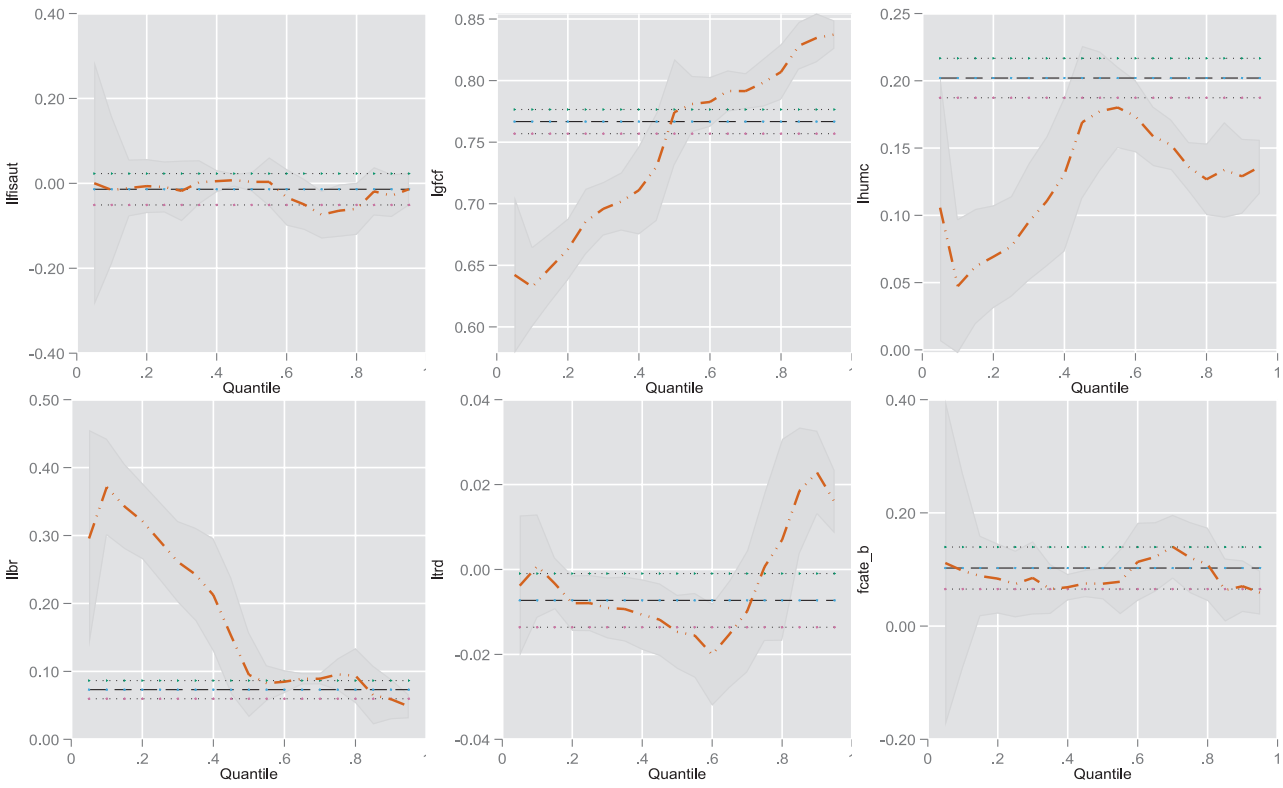

FIGURE 6 | Coefficients changes in quantile regression for Category B municipality.

- Regarding district municipalities, they should be empowered to coordinate fiscal policies and resource allocation among the local municipalities within their jurisdiction. For example, a district municipality could pool resources from its constituent local municipalities to fund large-scale infrastructure projects that benefit the entire district, such as a regional facility for solid waste management systems. District municipalities could also manage centralized

TABLE 11 | Powell (2022) panel quantile regression with fixed effects (PPQR-FE) results.

Panel A: full sample							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
	PPQR-FE full sample	**PPQR-FE full sample**	**PPQR-FE full sample**	**PPQR-FE full sample**	**PPQR-FE full sample**	**PPQR-FE full sample**	**PPQR-FE full sample**
Variables	**Qu 0.05**	**Qu 0.1**	**Qu 0.25**	**Qu 0.50**	**Qu 0.75**	**Qu 0.90**	**Qu 0.95**
LLFISAUT	0.100*** (0.005)	0.069*** (0.003)	0.094*** (0.002)	0.035*** (0.009)	0.018 (0.012)	0.036*** (0.001)	0.047*** (0.001)
LGFCF	0.641*** (0.005)	0.634*** (0.002)	0.661*** (0.004)	0.788*** (0.002)	0.801*** (0.026)	0.848*** (0.001)	0.835*** (0.002)
LHUMC	0.085*** (0.008)	0.022*** (0.005)	0.121*** (0.004)	0.164*** (0.004)	0.103*** (0.010)	0.124*** (0.002)	0.142*** (0.002)
LLBR	0.319*** (0.004)	0.405*** (0.006)	0.292*** (0.005)	0.096*** (0.004)	0.138*** (0.020)	0.061*** (0.001)	0.046*** (0.002)
LTRD	0.000 (0.001)	−0.010*** (0.002)	−0.007*** (0.001)	0.002 (0.001)	0.028*** (0.008)	0.012*** (0.001)	0.029*** (0.002)
Obs.	2289	2289	2289	2289	2289	2289	2289
Panel B: metro municipalities (Category A)							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
	PPQR-FE Cate_A	**PPQR-FE Cate_A**	**PPQR-FE Cate_A**	**PPQR-FE Cate_A**	**PPQR-FE Cate_A**	**PPQR-FE Cate_A**	**PPQR-FE Cate_A**
Variables	**Qu 0.05**	**Qu 0.1**	**Qu 0.25**	**Qu 0.50**	**Qu 0.75**	**Qu 0.90**	**Qu 0.95**
LLFISAUT	0.109*** (0.003)	0.032*** (0.012)	0.062*** (0.001)	0.076*** (0.001)	0.014* (0.008)	0.038*** (0.002)	0.047*** (0.001)
LGFCF	0.649*** (0.003)	0.643*** (0.001)	0.677*** (0.002)	0.778*** (0.001)	0.795*** (0.011)	0.826*** (0.003)	0.841*** (0.002)
LHUMC	0.126*** (0.005)	0.085*** (0.024)	0.074*** (0.002)	0.174*** (0.002)	0.093*** (0.008)	0.150*** (0.005)	0.136*** (0.002)
LLBR	0.272*** (0.007)	0.363*** (0.011)	0.300*** (0.003)	0.096*** (0.001)	0.160*** (0.012)	0.052*** (0.003)	0.041*** (0.002)
LTRD	−0.000 (0.001)	−0.018*** (0.006)	−0.010*** (0.000)	−0.017*** (0.000)	0.038*** (0.007)	0.016*** (0.001)	0.019*** (0.001)
FCATE_A	−0.101*** (0.026)	0.460 (0.290)	−0.145*** (0.003)	−0.063*** (0.009)	0.013 (0.020)	−0.100*** (0.007)	−0.062*** (0.008)
Obs.	2289	2289	2289	2289	2289	2289	2289
Panel C: district municipalities (Category C)							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
	PPQR-FE Cate_C	**PPQR-FE Cate_C**	**PPQR-FE Cate_C**	**PPQR-FE Cate_C**	**PPQR-FE Cate_C**	**PPQR-FE Cate_C**	**PPQR-FE Cate_C**
Variables	**Qu 0.05**	**Qu 0.1**	**Qu 0.25**	**Qu 0.50**	**Qu 0.75**	**Qu 0.90**	**Qu 0.95**
LLFISAUT	0.100*** (0.005)	0.072*** (0.004)	0.076*** (0.001)	0.052*** (0.004)	0.000 (0.007)	0.026*** (0.004)	0.042*** (0.001)
LGFCF	0.627*** (0.010)	0.611*** (0.001)	0.660*** (0.002)	0.768*** (0.001)	0.834*** (0.007)	0.846*** (0.003)	0.847*** (0.002)

(Continues)

TABLE 11 | (Continued)

Panel C: district municipalities (Category C)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	PPQR-FE Cate_C	PPQR-FE Cate_C	PPQR-FE Cate_C	PPQR-FE Cate_C	PPQR-FE Cate_C	PPQR-FE Cate_C	PPQR-FE Cate_C
Variables	**Qu 0.05**	**Qu 0.1**	**Qu 0.25**	**Qu 0.50**	**Qu 0.75**	**Qu 0.90**	**Qu 0.95**
LHUMC	0.059*** (0.005)	0.059*** (0.004)	0.096*** (0.003)	0.088*** (0.012)	0.044** (0.022)	0.148*** (0.001)	0.159*** (0.004)
LLBR	0.365*** (0.010)	0.391*** (0.003)	0.324*** (0.004)	0.194*** (0.013)	0.141*** (0.015)	0.037*** (0.003)	0.015*** (0.005)
LTRD	−0.019 (0.014)	−0.001 (0.001)	−0.016*** (0.001)	−0.023*** (0.001)	0.004 (0.009)	0.022*** (0.000)	0.018*** (0.001)
FCATE_C	0.316*** (0.015)	0.337*** (0.009)	−0.170*** (0.014)	−0.007 (0.019)	−0.007 (0.028)	0.018*** (0.006)	−0.004 (0.005)
Obs.	2289	2289	2289	2289	2289	2289	2289

Panel D: local municipalities (Category B)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	PPQR-FE Cate_B	PPQR-FE Cate_B	PPQR-FE Cate_B	PPQR-FE Cate_B	PPQR-FE Cate_B	PPQR-FE Cate_B	PPQR-FE Cate_B
Variables	**Qu 0.05**	**Qu 0.1**	**Qu 0.25**	**Qu 0.50**	**Qu 0.75**	**Qu 0.90**	**Qu 0.95**
LLFISAUT	0.169** (0.077)	−0.032*** (0.004)	−0.006 (0.006)	−0.008 (0.007)	0.047*** (0.008)	−0.037*** (0.003)	−0.079*** (0.021)
LGFCF	0.651*** (0.004)	0.639*** (0.003)	0.685*** (0.000)	0.781*** (0.001)	0.801*** (0.004)	0.837*** (0.001)	0.835*** (0.012)
LHUMC	0.111*** (0.006)	0.048*** (0.002)	0.075*** (0.001)	0.169*** (0.002)	0.102*** (0.004)	0.126*** (0.002)	0.143*** (0.007)
LLBR	0.292*** (0.009)	0.373*** (0.001)	0.294*** (0.001)	0.098*** (0.002)	0.154*** (0.007)	0.060*** (0.001)	0.038*** (0.007)
LTRD	−0.012*** (0.002)	−0.008** (0.004)	−0.005*** (0.001)	−0.017*** (0.001)	0.012*** (0.002)	0.019*** (0.001)	0.020*** (0.002)
FCATE_B	−0.053 (0.078)	0.109*** (0.007)	0.071*** (0.006)	0.079*** (0.007)	−0.004 (0.009)	0.078*** (0.003)	0.129*** (0.018)
Obs.	2289	2289	2289	2289	2289	2289	2289

Note: ***, **, and * denote significance at 1%, 5%, and 10%, respectively. Robust standard errors in parentheses. The dependent variable is gross value added at basic prices, a proxy for local economic development (LED). Qu 0.05, Qu 0.1, Qu 0.25, Qu 0.50, Qu 0.75, Qu 0.90, and Qu 0.95 represent quantile regression 0.05, 0.10, 0.25, 0.50, 0.75, 0.90, and 0.95 percentiles, respectively.

Source: Author's computations.

procurement for goods and services, achieving economies of scale and cost savings through bulk purchasing that local municipalities could not achieve individually.

- The findings suggest that increasing fiscal autonomy in local municipalities (Category B) positively contributes to LED. This implies that policies should prioritize devolving more financial control and revenue-generating powers to local municipalities in South Africa, particularly those with improving economic performance, where fiscal autonomy has the greatest impact. The national government should enact legislative reforms that allow local municipalities greater leeway to introduce or adjust local taxes and fees that align with their economic activities and capacities. For example, a municipality in a tourism-rich area could implement tourism levies, hotel occupancy fees, resort taxes, or environmental fees that capture revenue from visitors, which can then be reinvested in local infrastructure and conservation efforts. It is also important that reforms be introduced to reduce bureaucratic burdens to enable local municipalities to manage their finances effectively without being overwhelmed by complex regulations. Finally, local municipalities should receive training and resources to improve financial management and revenue collection.

6 | Conclusion, Limitations, and Future Study Directions

6.1 | Conclusion

Despite fiscal reforms by the South African government to achieve SDG Target 17.1—enhancing domestic resource mobilization for development—the effect of fiscal autonomy on LED at the municipal level remains insufficiently understood. This study addresses this gap by analyzing the impact of fiscal autonomy on LED across 248 South African municipalities from 2009 to 2023, contributing valuable insights to the existing literature. Using econometric methods such as pooled OLS, FEs, D-K model, s-GMM, MMQ-BR and Powell's (2022) PPQR-FE, the results indicate a long-run equilibrium among the variables.

The D-K model results for the full sample indicate a modest positive impact of fiscal autonomy on LED, with a 1% increase in fiscal autonomy resulting in a 0.004% rise in LED. For metro municipalities, fiscal autonomy has a stronger positive impact (0.209%), but district and local municipalities show negative impacts. The s-GMM results suggest that fiscal autonomy has a larger positive impact on LED for the full sample (0.041%), with local municipalities experiencing the highest benefits (6.754%). In contrast, metro municipalities experience a negative impact (−0.848%), likely due to inefficiencies in fiscal management. In metro municipalities, fiscal autonomy may hinder LED because of complex administrative structures, as indicated by the negative result. District municipalities, on the other hand, benefit significantly from fiscal autonomy (0.063% increase in LED), balancing local knowledge and central oversight, as supported by Faguet (2004). Local municipalities exhibit the highest gains from fiscal autonomy, as they can respond efficiently to local needs and stimulate grassroots economic activities, aligning with Oates' (1993) decentralization theory.

The MMQ-BR and PPQR-FE models reveal a consistently negative and significant impact of fiscal autonomy on LED across all quantiles in metropolitan municipalities, suggesting that fiscal autonomy may hinder LED, particularly in less developed metros. This implies that the metros may need stricter regulatory oversight and accountability measures to avoid inefficiencies. Designing policies aligned with each municipality's economic capacity can enhance the impact of fiscal autonomy, ensuring local governments fully leverage their potential for economic development. The MMQ-BR and PPQR-FE models further reveals that fiscal autonomy's impact on LED is more pronounced at higher quantiles, especially in local municipalities. However, struggling municipalities (lower quantiles) may require stronger governance and institutional frameworks to realize the benefits of fiscal autonomy. Overall, the findings suggest that metros, with their complex economies, may require robust regulatory oversight and advanced financial management systems. They would benefit from stricter controls and incentives that ensure their resources are well-utilized. On the other hand, smaller local municipalities need more flexibility and simplified administrative processes to efficiently manage their limited resources and capitalize on their unique economic activities. District municipalities, with their coordinating role, should focus on pooling resources and services across regions, optimizing economies of scale.

6.2 | Limitations and Future Research

The study's limitation lies in the use of secondary data, which may not capture the full scope of informal revenue sources or unreported fiscal activities across municipalities. Additionally, the focus on South Africa limits the generalizability of the findings to other developing nations. Therefore, future studies could explore the impact of fiscal autonomy on specific sectors, such as healthcare or education, across diverse regions. Researchers could also examine the effects of political decentralization alongside fiscal autonomy, offering a comparative analysis across both developed and developing countries.

Author Contributions

N.M. and C.S.S. conceptualized the study idea, drafted the paper, collected data, analyzed data, wrote the introduction section, organized the literature review, drafted the methodology section, interpreted the results, and provided the discussions, concluded the study with policy implications, and organized the reference list. N.M. and C.S.S. equally proofread, edited, and finalized the article.

Acknowledgements

We are grateful to Google Company for the financial support that they gave to this project. The usual disclaimer applies.

Ethics Statement

The authors have nothing to report.

Consent

This manuscript is an original work produced by the authors. N.M. and C.S.S. are aware of its content and approve its submission. It is also important to mention that the manuscript has not been published

elsewhere in part or in its entirety and is not under consideration by another journal. The authors have given consent for this article to be submitted for publication in *Sustainable Development*.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

All data generated or analysed during this study are not included in this submission but can be made available upon reasonable request.

Endnotes

[1]The website can be found at: https://www.quantec.co.za/easydata/.

[2]The website can be found at: https://lg.treasury.gov.za/ibi_apps/signin.

References

Alibegović, D. J., S. Hodžić, and E. Bečić. 2019. "The Level of Fiscal Autonomy: Evidence From Croatia, Serbia and Bosnia and Herzegovina." *NISPAcee Journal of Public Administration and Policy* 12, no. 1: 91–112.

Alvarado, R., B. Tillaguango, V. Dagar, et al. 2021. "Ecological Footprint, Economic Complexity and Natural Resources Rents in Latin America: Empirical Evidence Using Quantile Regressions." *Journal of Cleaner Production* 318: 128585.

Arellano, M., and O. Bover. 1995. "Another Look at the Instrumental Variable Estimation of Error-Components Models." *Journal of Econometrics* 68, no. 1: 29–51.

Arellano, M., and S. Bond. 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies* 58, no. 2: 277–297.

Bahl, R. W., and J. Martinez-Vazquez. 2006. *Sequencing Fiscal Decentralization*. World Bank Publications.

Baltagi, B. H., P. Egger, and M. Pfaffermayr. 2007. "Estimating Models of Complex FDI: Are There Third-Country Effects?" *Journal of Econometrics* 140, no. 1: 260–281.

Bird, R. M. 2011. "Subnational Taxation in Developing Countries: A Review of the Literature." *Journal of International Commerce, Economics and Policy* 2, no. 1: 139–161.

Bird, R. M., and F. Vaillancourt. 1998. "Fiscal Decentralization in Developing Countries: An Overview." *Fiscal Decentralization in Developing Countries* 1: 1–48.

Blöchliger, H., and J. Rabesona. 2009. "The Fiscal Autonomy of Sub-Central Governments: An Update." https://www.oecd-ilibrary.org/docserver/5k97b111wb0t-en.pdf?expires=1726753302&id=id&accname=guest&checksum=4A57BAD532D09EB6D3F2984CA5CFA440.

Blundell, R., and S. Bond. 1998. "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics* 87, no. 1: 115–143.

Boetti, L., M. Piacenza, and G. Turati. 2012. "Decentralization and Local Governments' Performance: How Does Fiscal Autonomy Affect Spending Efficiency?" *FinanzArchiv/Public Finance Analysis* 68: 269–302.

Brennan, G., and J. M. Buchanan. 1980. *The Power to Tax: Analytic Foundations of a Fiscal Constitution*. Cambridge University Press.

Cameron, R. 2021. "Central–Local Financial Relations in South Africa." In *Regulating Local Authorities*, 113–134. Routledge.

Cifuentes-Faura, J., M. T. Fülöp, and D. I. Topor. 2024. "Financial Autonomy in Spanish Local Governments: Empirical Evidence of Beta and Sigma Convergence." *International Review of Administrative Sciences* 90, no. 3: 599–614.

Cifuentes-Faura, J., M. Simionescu, and B. Gavurova. 2022. "Determinants of Local Government Deficit: Evidence From Spanish Municipalities." *Heliyon* 8, no. 12: e12393.

D'Agostino, R. B., A. Belanger, and R. B. D'Agostino Jr. 1990. "A Suggestion for Using Powerful and Informative Tests of Normality." *American Statistician* 44, no. 4: 316–321.

Didik, S., K. S. Abdul, and Y. Saadah. 2018. "Influence of Investment, Local Expenditure and Fiscal Autonomy Towards Economic Growth in Southern Sumatera of Indonesia." *Russian Journal of Agricultural and Socio-Economic Sciences* 80, no. 8: 19–25.

Driscoll, J. C., and A. C. Kraay. 1998. "Consistent Covariance Matrix Estimation With Spatially Dependent Panel Data." *Review of Economics and Statistics* 80, no. 4: 549–560.

Faguet, J. P. 2004. "Does Decentralization Increase Government Responsiveness to Local Needs?: Evidence From Bolivia." *Journal of Public Economics* 88, no. 3–4: 867–893.

Faridi, M. Z., and R. Nazar. 2013. "Impact of Fiscal Autonomy on Poverty in Pakistan." *Pakistan Journal of Commerce and Social Sciences* 7, no. 1: 141–156.

Fenton, T. 2018. "Regional Economic Activity by Gross Value Added (Balanced)." UK: 1998 to 2017.

Frankel, J. A., and D. Romer. 2017. "Does Trade Cause Growth?" In *Global Trade*, 255–276. Routledge.

Fuinhas, J. A., and A. C. Marques, eds. 2019. *The Extended Energy–Growth Nexus: Theory and Empirical Applications*. Academic Press.

Gadenne, L., and M. Singhal. 2014. "Decentralization in Developing Economies." *Annual Review of Economics* 6, no. 1: 581–604.

Gumede, N., J. Byamukama, and E. Dakora. 2019. "Contemporary Perspectives on Fiscal Decentralisation and New Local Government in South Africa." *Ghana Journal of Development Studies* 16, no. 2: 52–69.

Hanif, I., S. Wallace, and P. Gago-de-Santos. 2020. "Economic Growth by Means of Fiscal Decentralization: An Empirical Study for Federal Developing Countries." *SAGE Open* 10, no. 4: 2158244020968088.

Hughes Hallett, A. 2017. "Fiscal Autonomy vs. Fiscal Federalism in the Euro Zone." *Economia Politica* 34: 179–188.

Im, K. S., M. H. Pesaran, and Y. Shin. 2003. "Testing for Unit Roots in Heterogeneous Panels." *Journal of Econometrics* 115, no. 1: 53–74.

Ivanyna, M., and A. Shah. 2012. "How Close Is Your Government to Its People? Worldwide Indicators on Localization and Decentralization." Worldwide Indicators on Localization and Decentralization (July 1, 2012). *World Bank Policy Research Working Paper*: 6138.

Keefer, P., and S. Knack. 1997. "Why Don't Poor Countries Catch Up? A Cross-National Test of an Institutional Explanation." *Economic Inquiry* 35, no. 3: 590–602.

Kitson, M., R. Martin, and P. Tyler. 2004. "Regional Competitiveness: An Elusive yet Key Concept?" *Regional Studies* 38, no. 9: 991–999.

Krugman, P. 1991. "Increasing Returns and Economic Geography." *Journal of Political Economy* 99, no. 3: 483–499.

Levin, A., C. F. Lin, and C. S. J. Chu. 2002. "Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties." *Journal of Econometrics* 108, no. 1: 1–24.

Lin, B., and Y. Zhou. 2022. "Understanding the Institutional Logic of Urban Environmental Pollution in China: Evidence From Fiscal Autonomy." *Process Safety and Environmental Protection* 164: 57–66.

Linawati, L., and N. Solikin. 2024. "Portrait of the Development of Fiscal Autonomy in Supporting Economic Growth of the Kediri City Government." *Journal of Development Research* 8, no. 1: 23–27.

Machado, J. A., and J. S. Silva. 2019. "Quantiles via Moments." *Journal of Econometrics* 213, no. 1: 145–173.

Manuel, L. B., and L. J. Erasmus. 2024. "A Sustainable Differentiated Funding Model for South African District Municipalities." *Journal of Local Government Research and Innovation* 5: 163.

Martin, R., A. Pike, P. Tyler, and B. Gardiner. 2015. "Spatially Rebalancing the UK Economy: The Need for a New Policy Model."

Martinez-Vazquez, J., and R. M. McNab. 2003. "Fiscal Decentralization and Economic Growth." *World Development* 31, no. 9: 1597–1616.

Mazibuko, G. 2019. "Autonomy and Financial Viability of Local Authorities in the Limpopo Province Republic of South Africa." *Journal of Social and Development Sciences* 10, no. 4S: 52–66.

Meloche, J. P., F. Vaillancourt, and S. Yilmaz. 2004. "Decentralization or Fiscal Autonomy? What Does Really Matter? Effects on Growth and Public Sector Size in European Transition Countries." What Does Really Matter.

Monkam, N. F. 2014. "Local Municipality Productive Efficiency and Its Determinants in South Africa." *Development Southern Africa* 31, no. 2: 275–298.

Musgrave, R. A., and R. A. Musgrave. 1959. *The Theory of Public Finance: A Study in Public Economy*. Vol. 658. McGraw-Hill.

Oates, W. E. 1972. *Fiscal Federalism*. HarcourtBrace Jovanovich Inc.

Oates, W. E. 1993. "Fiscal Decentralization and Economic Development." *National Tax Journal* 46, no. 2: 237–243.

Oates, W. E. 1999. "An Essay on Fiscal Federalism." *Journal of Economic Literature* 37, no. 3: 1120–1149.

Oates, W. E. 2004. "An Essay on Fiscal Federalism." In *Environmental Policy and Fiscal Federalism*, 384–414. Edward Elgar Publishing.

Pesaran, M. H., and T. Yamagata. 2008. "Testing Slope Homogeneity in Large Panels." *Journal of Econometrics* 142, no. 1: 50–93.

Powell, D. 2022. "Quantile Regression With Nonadditive Fixed Effects." *Empirical Economics* 63, no. 5: 2675–2691.

Prud'Homme, R. 1995. "The Dangers of Decentralization." *World Bank Research Observer* 10, no. 2: 201–220.

Putri, R. N. H., and S. P. M. A. Saputra. 2019. "Decentralization and Financial Local Governments Performance: How Does Fiscal Autonomy Affect Spending, Economic Growth, and Poverty in East Java Indonesia?" *Journal of Poverty, Investment and Development* 59: 1–13.

Qiao, B., J. Martinez-Vazquez, and Y. Xu. 2008. "The Tradeoff Between Growth and Equity in Decentralization Policy: China's Experience." *Journal of Development Economics* 86, no. 1: 112–128.

Rodden, J. 2002. "The Dilemma of Fiscal Federalism: Grants and Fiscal Performance Around the World." *American Journal of Political Science* 46: 670–687.

Rodden, J. 2004. "Comparative Federalism and Decentralization: On Meaning and Measurement." *Comparative Politics* 36: 481–500.

Rodríguez-Pose, A., and R. Ezcurra. 2011. "Is Fiscal Decentralization Harmful for Economic Growth? Evidence From the OECD Countries." *Journal of Economic Geography* 11, no. 4: 619–643.

Roodman, D. 2009. "How to Do Xtabond2: An Introduction to Difference and System GMM in Stata." *Stata Journal* 9, no. 1: 86–136.

Romer, P. M. 1990. "Endogenous Technological Change." *Journal of Political Economy* 98, no. 5: 71–102.

Rondinelli, D. A. 2017. "Decentralization and Development." In *International Development Governance*, 391–404. Routledge.

Royston, J. P. 1983. "A Simple Method for Evaluating the Shapiro–Francia *W*′ Test of Non-Normality." *Journal of the Royal Statistical Society Series D: The Statistician* 32, no. 3: 297–300.

Royston, P. 1992. "Comment on sg3.4 and an Improved D'Agostino Test." *Stata Technical Bulletin* 1, no. 3: sg3.5.

Saba, C. S., A. L. O. L. A. Andrew Adewale, and N. G. E. P. A. H. Nicholas. 2025. "Exploring the Role of Governance and Institutional Indicators in Environmental Degradation Across Global Regions." *Environmental Development*: 101152.

Sacchi, A., and S. Salotti. 2014. "How Regional Inequality Affects Fiscal Decentralisation: Accounting for the Autonomy of Subcentral Governments." *Environment and Planning. C, Government & Policy* 32, no. 1: 144–162.

Sala-i-Martin, X. X., and R. J. Barro. 1995. "Technological Diffusion, Convergence, and Growth." (No. 735). Center Discussion Paper.

Sanggrangbano, A., A. E. Antoh, and S. I. Timisela. 2024. "The Impact of Special Autonomy Fiscal Policy on Papua's Economic Development." *International Journal of Accounting & Finance in Asia Pasific* 7, no. 1: 1–13.

Shah, A. 2003. "Fiscal Decentralization in Transition Economies and Developing Countries." In *Federalism in a Changing World: Learning From Each Other*. McGill-Queen's University Press. https://doi.org/10.1515/9780773571402-030.

Shah, A. 2004. *Fiscal Decentralization in Developing and Transition Economies: Progress, Problems, and the Promise*. World Bank Publications.

Skinner, C. 1999. "Local Government in Transition: A Gendered Analysis of Trends in Urban Policy and Practice Regarding Street Trading in Five South African Cities." School of Development Studies (Incorporating CSDS), University of Natal.

Slemrod, J., and S. Yitzhaki. 2002. "Tax Avoidance, Evasion, and Administration." In *Handbook of Public Economics*, vol. 3, 1423–1470. Elsevier.

Smoke, P. 2015. "Rethinking Decentralization: Assessing Challenges to a Popular Public Sector Reform." *Public Administration and Development* 35, no. 2: 97–112.

Smoke, P. J. 2001. *Fiscal Decentralization in Developing Countries: A Review of Current Concepts and Practice*. United Nations Research Institute for Social Development.

Tan, A. 2020. "Raising Local Fiscal Autonomy in the Local Autonomy Management: A Study in Bogor Regency." *Jurnal Bina Praja* 12, no. 1: 53–63.

Tiebout, C. M. 1956. "A Pure Theory of Local Expenditures." *Journal of Political Economy* 64, no. 5: 416–424.

Turok, I. 2014. "The Resilience of South African Cities a Decade After Local Democracy." *Environment and Planning A* 46, no. 4: 749–769.

Van Zyl, A. 2003. "The Fiscal Autonomy of Provinces in the 1996 Constitution and in Practice." *Politeia* 22, no. 1: 22–37.