The Contribution of Fiscal Decentralization to Regional Inequality: Empirical Results for South African Municipalities

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Abstract

Within South Africa's decentralized governance framework, municipal authorities are an integral part of ongoing efforts to enhance economic development and reduce regional disparities. Using panel data for South Africa's 234 municipalities over the period 2003–2012, we evaluate the impact of fiscal decentralization on inter–regional inequality. The results of the empirical analysis provide evidence of a statistically significant relationship between fiscal decentralization and inequality in the context of South Africa's local government sphere, with the specific nature of the relationship contingent on how fiscal decentralization is measured. In the case of revenue based measures of fiscal decentralization, the results support the hypothesis that the commitment device of fiscal decentralization provides incentives that decrease inter–municipal inequality. On the other hand, expenditure based fiscal decentralization contribute to increased inter–municipal disparities.

JEL classification: H73, H77, O18, R11, R12.

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1 Introduction

In developing countries where growing socio–economic inequalities have threatened to undermine social cohesion and political stability, the structure underpinning the fiscal and administrative autonomy of sub–national units has generated considerable interest among politicians, policymakers and academics. This interest has largely arisen from competing views about the redistributive consequences of fiscal decentralization, and its efficacy in addressing the spatial dimensions of inequality.

One strand of the literature argues that fiscal decentralization results in a more equitable distribution of public services across regions and provides increased opportunities for poor citizens. Where electoral (and democratic) processes are an enshrined feature of decentralized governance structures, voting offers citizens the opportunity to dispense of elected sub–national authorities (or officials) that fail to implement fiscal measures to boost regional economic growth and enhance social welfare. Hence, (fiscal) decentralization that promotes inter–jurisdictional competition can induce officials in poorer regions to innovate and adopt effective policies that could attract growth-enhancing investments beneficial to the socio–economic well–being of local citizens. Such outcomes raise the possibility that the process of regional convergence can occur without a need to rely on centrally mandated redistribution programs (Qian and Weingast, 1997).

The positive redistributive effects of decentralization often ignores the fact that different regions begin the process of decentralization with varying degrees of resource endowments and at different levels of economic development. Relative to poorer jurisdictions, richer regions with access to larger tax bases are more likely to be adept at providing relatively higher levels of public goods or the same quantity and quality of public services at lower tax rates. Thus, rather than foster a reduction, decentralization induced competition may exacerbate existing regional disparities as mobile factors of production relocate to richer regions that are able to provide better levels of socio–economic infrastructure and qualified human capital at lower comparative costs (Lessman, 2009).[1] In addition, when fiscal decentralization requires that sub-national units exercise greater administrative autonomy and control over fiscal resources, limits are placed on both the quantum of fiscal resources and extent of budgetary powers available to a central government. Such constraints are likely to curtail the ability of a central authority to implement redistribution programs that address interregional inequalities (Prud'homme, 1995).

The question of whether decentralization reduces or worsens regional disparities is particularly important for South Africa where the need to create decentralized administrative and fiscal structures was integral to the country's post–1994 democratic transition. The significant social, political and economic reforms of the post–democratic period included the establishment of an intergovernmental fiscal relations system in which South Africa's local government sphere is expected to fulfill a "developmental" role. In line with this mandate, municipalities are expected to utilize assigned

[1] According to Lessman (2009), the skewed concentration of mobile factors will boost the tax bases and income levels within richer regions. In the absence of effective redistribution programs, such skewed concentration might result in a widening inequality gap between regions. Kelejian and Robinson (1997) argue that the need to be competitive could also drive local authorities to ignore spatial spillovers, resulting in the inadequate and inequitable provision of public goods across different regions.

fiscal functions as the main tool to address significant historical inequities in the distribution of, and access to socio–economic infrastructure and resources. However, the persistently poor state of service delivery, poor financial management and inadequate capacity to design and implement service delivery plans within many municipalities has raised mounting concerns around on whether the decentralization initiatives within South Africa's local government sphere remains a viable strategy for reducing existing interregional inequalities.

Efforts to enhance the developmental role of municipalities have taken both short and long–term approaches. In the short–term, programs aimed at enhancing the accounting systems, budget implementation and project management capacity of municipalities, have been initiated by national and provincial governments as well private institutions.However, a combination of inadequate intergovernmental checks and balances, the absence of sustained assessments of post-intervention service delivery functions and a one–size–fits all approach resulted in the short–term initiatives failing to institutionalize and sustain capacity and delivery improvements in targeted municipalities (Financial and Commission, 2012). Proposed long–term solutions have emphasized radical legislative and structural proposals aimed at reducing the size, and reforming the functions of municipalities within the local government sphere. These proposals have mainly focused on plans to either (i) restructure district municipalities so that district governance structures exist only in areas where there are weak municipalities, with the powers of abolished districts then transferred to capable municipalities or provinces, (ii) incorporate financially distressed municipalities into provincial and national administrations, or (iii) where appropriate, merge administratively and financially weak local municipalities into metropolitan administrations which, in contrast to small district municipalities, could attract revenue and efficiently deliver public services. Either of these approaches is expected to provide for an intergovernmental system that is functional, effective, economically sustainable, and integrates communities in a manner that addresses large disparities in income and economic opportunities across the country's different regions (African National Congress, 2012).

Much debate remains around the efficacy of proposals to restructure municipalities. With a focus on skills shortages and poor administration, the proposed reforms have devoted little attention to the important link between municipal size and service delivery. Very often, South Africa's municipalities face the twin challenges of allocating relatively small budgets towards the provision of public services to either towns and cities spread over vast areas, or jurisdictions with populations with a relatively high demand for public services. Additionally, beyond the main metropolitan areas and secondary cities, the capacity of mainly rural municipalities is further stretched by the need to provide services to jurisdictions characterized by low population densities and limited revenue raising capacity. It is thus argued that overcoming such challenges will require that efforts aimed at enhancing the service delivery functions of municipalities give serious consideration to the creation of a greater number of smaller municipalities or decentralized local administrative structures (Holborn and Moloi, 2012).

Irrespective of whether a proposal of reduced or increased decentralized governance structure is eventually adopted, it is imperative that the preferred policy option be informed by a sound understanding of the effects of fiscal decentralization on inequalities. In the context of South Africa,

the debate on the redistributive effects of fiscal decentralization remains a subject for which detailed empirical evidence is lacking. Against this background, the primary purpose of this paper is to provide an empirical perspective on the relationship between fiscal decentralization and regional inequalities across municipalities in South Africa.

Several reasons make the focus on South Africa a relevant exercise. First, the administrative and political structures of many African countries function under Constitutions that are pro–decentralization and recognize the autonomy of sub-national governments. Despite this, the African evidence on the relationship between fiscal decentralization and regional inequality remains very limited. With the notable exception of the work by Akramov and Asante (2009) on Ghana, this limited evidence is primarily derived from the cross-country analysis of a sample of developing and developed countries (see for example Shankar and Shah (2003) and Sepulveda and Martinez-Vazquez (2011)). In examining the decentralization–regional inequality nexus for South Africa, this study not only addresses the paucity of Africa related studies, but also provides single country experience that yields more objective estimates of the impact of fiscal decentralization than those of cross-country analysis that often ignore country-specific historical, cultural and institutional variations that could affect influence of fiscal decentralization on regional inequalities. Second, the process of decentralization in South Africa, particularly at the local government sphere, contrasts with those in many other developing countries that where challenges exist with establishing effective frameworks for inter-governmental relations, and developing appropriate degrees of autonomy for sub–national units (Bahl and Smoke, 2003). South Africa's 1996 Constitution has created an intergovernmental system in which the main municipal functions relate to providing crucial socio-economic services that have spillover effects. To support these functions and ensure sustainability of positive spillover effects, the Constitution stipulates that the local government fiscal framework be characterized by relatively productive local revenue sources and a mechanism for recurrent intergovernmental transfers that have positive re-distributional effects. The study on South Africa thus adds a new dimension to extant literature - that of the redistributive effects of fiscal decentralization in an African country with a maturing system of democracy and decentralized governance.

The rest of the paper is organized as follows. Section 2 offers a brief overview of fiscal decentralization and inequalities in South Africa. Section 3 presents the theoretical framework that examines the channels through which fiscal decentralization affects regional inequalities. Section 4 outlines the empirical model and describes the data, followed by a discussion of the econometric strategy and presentation of the empirical results in Section 5. Section 6 concludes with a summary of the main conclusions and implications of the findings from the study.

2 Overview of Decentralization and Inequalities in South Africa

The present state of decentralization and inequality in South Africa is best understood in the context of the country's history. Prior to the democratic transformation in 1994, South Africa's system of decentralization was largely shaped by the country's experimentation with demarcating

jurisdictions and organizing governance on the basis of race, rather than on the basis of functional linkages or similar criteria (van Rynevald, 1996). Under apartheid, the geographical configuration of South Africa along racial lines created a system of fiscal and administrative decentralization organized along three tiers. The first tier was made up of the central/national government. The second tier consisted of three categories of government in the form of four provinces, and ten "Bantustans" comprised of six self-governing territories (SGTs) and four independent homelands that were collectively termed the "TVBC" states.[2]

Similar to local government structures, the last tier of government consisted of white local authorities (WLAs) and black local Authorities (BLAs).[3]WLAs represented the earliest example of fiscal decentralization in South Africa. Established in the early 1900s, they covered most of the country's urban commercial and industrial areas, and were primarily responsible for providing services to urban white, coloured and Indian citizens resident in areas outside of the homelands. With access to relatively wealthy sections of society, WLAs enjoyed a high degree of fiscal autonomy that assured their status as the only sub–central authorities that financed a significant proportion of current expenditures using own revenues generated via property rates and user charges on electricity, water and sanitation (see Table 2.1). In sharp contrast, apartheid restrictions on economic development in black areas coupled with a hugely disproportionate allocation of socio economic infrastructure and a lack of access to property, quality education and formal employment amongst black South Africans impaired the capacity of BLAs to develop productive tax bases. As a result, BLAs generated very little own revenue, operated inefficient fiscal systems, and lacked capacity to provide necessary socio-economic services. The inability of BLAs to raise sufficient revenues through fees on traded services was further compounded by the central government's provision of free housing and unmetered water services, as well as little or no electrification of black townships.

Social engineering during the apartheid era had marked consequences for inequality in South Africa. In the major cities, segregation enabled the majority of South Africa's white population to reside within urbanized neighborhoods located around areas of relatively lucrative commercial activities, and with access to good municipal infrastructure. The stringent application of controlled urbanization policies meant that most of the country's non-white population became residents of racially–designated group areas beset with high levels of poverty and minimal socio-economic infrastructure. The deprivations faced by the non-white population was further exacerbated by

[2]Lester et al. (2000) and Christopher (1994) provide a detailed analysis of socio–economic and political segregationist practices and policies that obtained pre–1948. The four provinces were Transvaal, Cape, Orange Free State and Natal. The six non-independent homelands included Kwazulu, Lebowa, Kangwane, QwaQwa, KwaNdebele and Gazunkulu while Transkei, Bophuthatswana, Venda and Ciskei made up the four "independent" black homelands. Very little formal structures of local authorities existed in the TVBC states and SGTs. In most cases, conventional local government functions were handled by the respective central authorities.

[3]The development of segregated local government bodies for Coloureds and Indians followed a separate path from that for Africans. Under the Group Areas Amendment Act of 1962, provincial administrators were tasked with forming "Local Affairs Committees" or "Management Committees" in designated Coloured and Indian areas. From their initial role as consultative bodies, these committees evolved into administrations granted full local authority status in terms of the criteria set out by provincial administrators. Despite their transformation into wholly elected entities, very few attained full autonomy as the majority of the committees status remained mere advisory bodies with little powers beyond granting trading licenses (Lemon, 1992).

Table 1 Sub-Central Total Expenditure and Share of Own-Revenues in Expenditure Financing : 1993/1994

Government Category	Total Expenditure (Millions of South African Rands)[a]	Own Revenue (% of Current Expenditures)
TVBC	15,553	20.1
SGT	14,485	10.3
Provinces	19,702	11.4
WLAs	25,692	97.7

Source: van Rynevald (1996).

strict restrictions on construction that limited accommodation to neighborhoods that were either severely overcrowded or dominated by poor housing structures such as shack dwellings and small, matchbox houses (Seekings, 2010).[4] Discriminatory spending on social infrastructure along racial lines created substantial disparities in the provision of basic services related to water, sanitation and electricity. By 1994, an estimated 12 million people lacked access to drinking water and another 21 million people deprived of adequate sanitation.The poor state of service provision to most of the black population was particularly acute for rural residents. Compared to the major urban and semi-urban centers with coverage rates of over 66%, sanitation in the black homelands reached less than half of the population, with many rural areas located within Bantustans having zero sanitation coverage (Development Bank Southern Africa, 1994). Similar disparities existed in the provision of electricity. By the first democratic elections in 1994, 64% of South Africa's households (the equivalent of about 3 million families) had no access to electricity supply, while some 4,000 predominantly rural clinic and 19,000 African schools lacked any connection to the electricity grid. Household electricity supply also varied along income and geographical lines – from 100% for formal, middle to high income areas to an an average of between 1% and 4% for the rural districts in the black homelands (Lester et al., 2000).

As part of the institutional and administrative framework designed to address the formidable economic and social inequalities inherited from the apartheid dispensation,post–1994 South Africa adopted a unitary system of governance consisting of national, provincial and local governments. Within this structure, the units operate not along hierarchical lines, but function as distinct, interdependent and interrelated "spheres". The interdependent and interrelated nature of the system is intended to foster a spirit of mutual co-operation and facilitate alignment in the implementation of policy, legislation and overall service delivery programs (Smoke, 2001). With the realignment of administrative units, the four provinces and nine homelands were scrapped and replaced by nine provinces, while the disparate system of racially based local administrations was consolidated into a local government structure in which municipalities were divided into three categories: (i) *Cate-*

[4]The situation for the homelands was no better. Although 80% of the country's population were Africans, the land areas for the homelands constituted only 13% of South Africa and excluded the wealthy mining and industrial regions. With limited development and economic activity to sustain their populations, physically able residents of these homelands were forced to continually seek jobs in the major cities. As a result, homelands became vast, highly impoverished regions that were mainly populated by those who were very young, elderly, sick, or disabled, and women who were unemployed (Marks and Andersson, 1987; Price, 1986).

gory A municipalities (metropolitan councils) with exclusive jurisdiction of large urban areas; (ii) *Category B* municipalities (local councils) that administer non-metropolitan areas, which vary in terms of both size and extent of urbanization, and (iii) *Category C* municipalities (districts councils) that geographically encompass several B municipalities; such districy authorities are responsible for coordinating integrated development planning for the entire district and the delivery of services on behalf of less capacitated *B* municipalities located within their borders, particularly those in the country's most rural areas.[5]

To ensure that municipalities are able to fulfill their developmental mandate, the Constitution grants local authorities substantial powers and functions, many of which are similar to those of the previous WLAs. About two–thirds of municipal functions relate to the provision of crucial socio-economic services including water, sanitation, roads, storm water drainage and electricity. In addition, the 1996 Constitution mandates municipalities to prioritize the 'basic needs' - services ranging from municipal health to street lightning and emergency services, of their communities. Given the importance of services provided by municipalities, the Constitution allocates to the local government sphere, a number of relatively broad revenue sources including rates on property and utility user fees on water, electricity and sanitation services provided by a municipality. These revenue sources are supplemented with funds intergovernmental transfers from nationally collected revenues.[6]

The decentralization of fiscal resources has enabled municipalities implement a range of expenditure programs to reduce extensive inter–regional inequalities. In cooperation with the national government, these programs have included the provision of a package of free basic services (FBS) in water, electricity, sanitation and refuse services to all citizens, especially those residing in poor households.[7] This strategy aided significant expansions in citizens' access to socio-economic infrastructure and social service, especially in South Africa's rural areas. Between 1995 and 2003, the number of people with access to safe drinking water increased by 9 million, while the proportion of

[5]Formal structures for the local government sphere were established following an elaborate three–stage process of transition that began in 1993 and concluded with the municipal elections of December 2000 (see Smoke (2001) and Steytler and de Visser (2009) for a comprehensive analysis of the history, demarcation and establishment of local government during this period). Following the 2016 local elections, the local government sphere now consists of a total of **257** municipalities of which 8 are categorized as *Category A*, 205 are *Category B*, and 44 are *Category C*.

[6]These transfers are a Constitutional requirement which states that municipalities be allocated an equitable share of nationally raised revenues. Intergovernmental transfers to municipalities are channeled either on a conditional or unconditional basis. Unconditional transfers are general purpose allocations and form the bulk of total transfers to the municipal sphere. The main unconditional grant is the local government equitable share (LES) intended to (i) reduce fiscal imbalances stemming from the asymmetric matching of revenue and expenditure functions and (ii) enable sub-national governments to provide basic services and perform any functions assigned to them. Conditional grants are earmarked funds directed at programs meant to address inter-jurisdictional spillovers, meet national redistribution objectives, and aid the implementation of specific national priorities and policies related to socio-economic services provided by municipalities.

[7]The FBS subsidy includes funding for the provision of *free basic water* (6 kiloliters per month for each poor household with formal connections or daily allocation of 25 liters of portable water within 200 meters from dwelling), *energy* (50 kilowatt-hours per month, which is the amount required for basic lighting and to power basic electrical appliances such as small radios and electric kettles) and *sanitation and refuse* (based on service levels defined by national policy). With the exception of free basic water, every household is entitled to these free services. However, most municipalities provide free basic water to all or almost all their residents. In 2012, the total cost of providing free basic services was worth R28billion (about $2.5billion).

households having access to sanitation increased from 49% to 63% 2003. The addition of 4 million people to the nation's electricity grid also resulted in the percentage of households with access to electricity supply increasing from 58% in 1994 to over 70% by 2002 (The Presidency, South Africa, 2003).

With economic growth averaging 3.2%, the first decade of the post–1994 transition represented South Africa's longest period of steady economic growth since World War II. However, this growth coincided with a period of increasing levels of inequality and unemployment as South Africa's Gini coefficient decreased very little – from 0.66 in 1993 to 0.63 in 2001, while the unemployment rate that had steadily risen since 1994 peaked at 31.2% in 2003. [8] The twin effects of steady economic growth and rising levels in unemployment created a 'jobless growth' phenomenon largely driven by the existence of two parallel economies – a modern, highly productive *first* economy integrated with the global economy and generating most of South Africa's country's wealth, and a *second* economy that despite incorporating a relatively large share of the country's population, was underdeveloped, structurally disconnected from the first (as well as global) economy and incapable of generating growth to sustain its mainly poor participants (Mbeki, 2004).

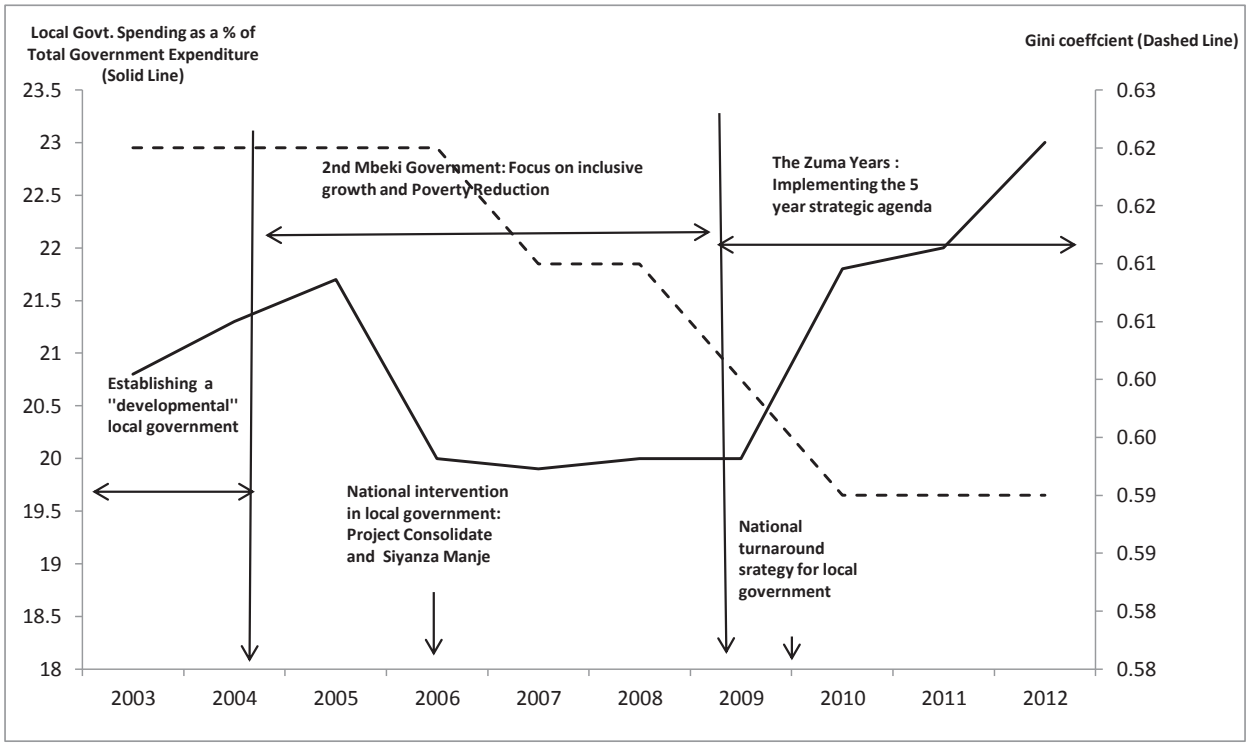
The adoption in 2004, of inclusive growth and poverty reduction as the central theme of economic policy marked South Africa's shift towards a developmental state. Within this state, all spheres of government are expected to play an active role in guiding and supporting economic economic growth (and development), while utilizing available resources to forge sustainable links between the *first* and *second* economies and, address the highly unequal access to socio–economic infrastructure and income opportunities. For many municipalities, especially those covering smaller towns and rural areas, challenges of poor financial management, inadequate administrative management systems, and poor performance management frameworks placed serious constraints on fulfilling their envisaged developmental role. Combating these shortcomings has prompted a variety of local government reforms centered on (i) enhancing capacity in skills-deficient municipalities, and (ii) improved coordination of intergovernmental relations around public spending on growth and poverty reduction initiatives (see Figure 1).

Beyond capacity improvement initiatives, reforms have also focused on aligning municipal responsibilities for providing vital socio-economic infrastructure with greater intergovernmental coordination to reduce expenditure inefficiencies and afford local authorities greater control of programs designed to reduce poverty and access to services. As shown in Figure 1, this alignment has resulted in a steady increase in the local government's share of consolidated government spending. While spending by municipalities has aided South Africa's plans for universal access to basic services, deep economic and social inequalities remain. Persistent capacity challenges have created wide disparities between urban (and peri–urban) and rural households access to basic services. Within metropolitan and urban municipalities, more than 92% of households have access to basic services of water,

[8] This figure corresponds to the narrow or strict definition of unemployment which includes only active job-seekers. Using the the broad or expanded definition that includes people who desired employment but were not actively looking for work, the unemployment rate reached 42.5% in 2003 (Seekings, 2007).

[9] Source: National Treasury Database

Figure 1 South Africa's Inequality and Government Policies: 2003 –2012.[9]



Source: Data from National Treasury

sanitation and electricity compared to just under 70% for rural municipalities. Furthermore service delivery backlogs – estimated at 19.3% for water, 32.6% for sanitation, 27.3% for electricity and 40.1% for refuse removal, have proved difficult to eradicate especially in relatively smaller and more rural municipalities where problems of inefficient resource utilization and uncoordinated administrative structures are acute. An assessment of South Africa's poverty profile reveals that average per capita income within metropolitan and urban areas (R51,500) is almost twice that of rural municipalities (R33,000). Between 2013 and 2014, an estimated 12.2 million South Africans were classified as living below the food poverty line – the amount that an individual will need to consume enough food in a month, of R305 per person per month. More than half or some 6.2 million food deprived persons were residents of rural municipalities. However, inequality appears to be more pronounced within the country's developed regions where in 2014, Gini coefficient averaged 0.61 across metropolitan and urban areas compared to 0.57 for rural municipalities.

In summary, the review of decentralization and inequality in South Africa shows that significant effort has been dedicated towards addressing the daunting legacy of apartheid–era social and economic inequalities. These efforts have yielded substantial improvements in citizens access to key socio–economic services. However, while extensive pro–poor spending has resulted in reduced poverty levels, post-1994 inequality levels remains very high by global standards. Given these observations and the envisaged role of decentralization as a tool to address existing inequalities, we now proceed to examine in a theoretical framework, how decentralization can be expected to

contribute to lowering inter–regional inequality, and whether empirically a negative relationship between decentralization and inequality exists in South Africa.

3 Theoretical Framework

Much of the traditional theoretical literature on fiscal decentralization focuses on its potential efficiency gains. For example, Musgrave and Musgrave (1973) and Oates (1972) argued that knowledge of local needs and preferences allows sub–national governments implement policies that may improve efficiency in the allocation of resources. Under conditions of sub-national governments autonomy and inter–jurisdictional mobility of factors of production, healthy inter-regional competition would drive officials to utilize their knowledge of local conditions in formulating policies that attract skilled labor and capital in a bid to promote (local) economic development.

Other theoretical studies have raised concerns that efficiency–improving fiscal decentralization could generate undesirable equity outcomes and have a detrimental effect on inter–regional equality. Oates (1972) posited that tax–transfer schemes implemented by a central government can channel resources from relatively richer regions to poorer ones while minimizing the effects of factor mobility. With sub-national governments often lacking suitable redistributive instruments, implementing a fiscally decentralized structure will only weaken the capacity of the only level of government (i.e. the central one) able to facilitate greater levels of equity in access to public services. With reduced resources for equalization programs, the potential for poor regions to catch up with richer ones becomes limited. Therefore, a reduction in equalization transfers initiated by fiscal decentralization is will increase existing inter-regional inequality.

Conversely, "second–generation" models of fiscal federalism (see for example, Qian and Weingast (1997)) contend that by avoiding soft budget constraints, fiscal decentralization may decrease inter-regional inequality without a need to use centrally-mandated redistribution policies. Within centralized governance systems, a central government can impose a tax–transfer system to redistribute resources from rich to poor regions. However, the assurance that transfers will be used to improve fiscal conditions of poor regions will create a soft budget constraint which could distort the incentives for such regions to exert some effort in growing their own local economies. In such cases, assigning greater fiscal autonomy to lower tiers of government will serve as commitment by a central government to non-bailout and ensure that fiscal decentralization endogenously hardens the budget constraints of sub–national governments. By avoiding the soft budget constraint, fiscal decentralization provides greater incentives for regions that can avoid being poor to increase efforts to formulate and implement effective pro-development policies. For richer jurisdictions, fiscal decentralization serves as an incentive mechanism that allows for the retention of resources that might have otherwise been transferred away to poorer regions, thereby increasing inter-regional income of richer jurisdictions.

In both fiscally decentralized and centralized settings, the extent of income inequality is determined by the difference in the incentive effects on rich regions and poor regions *ex–ante*. If the

incentive effects of decentralization on an *ex-ante* poor region exceeds that on a rich region, the reduction inter-regional inequality may greater in a framework that devolves fiscal powers to sub-national units. To understand the rationale for this conclusion, we outline a theoretical model that is a straightforward adaptation of Akai and Sakata (2009).

Consider the case of an economy that consists of n poor (***P***) regions and a single rich region (***R***). To make the model more tractable, population size in each region type is assumed to be one and residents are immobile due to relocation costs and non-monetary factors (such as the need to adapt to new cultures and traditions). Income in each region i is denoted as:

$$\text{Income in region } i = \begin{cases} y^i: & \text{Actual resource} \rightarrow \text{ Endowment} \\ e^i: & \text{Potential resource} \rightarrow \text{Generated by effort} \end{cases}$$

Suppose that regions do not function in isolation and there exists positive externalities of resources among regions, particularly the poorer jurisdictions. In this case, the potential income of region i will depend not only on its endowment and resources generated by own efforts, but also on the complementaries of local resources arising from the efforts of other regions. The production function of the potential income in region i is expressed as:

$$h^i = y^i + f(e^i) + \alpha(\sum_{j \neq 1}^{n} f(e^j)) - c(e^i) \tag{1}$$

where α denotes the degree of spillover effects from other regions, and $c(e^i)$ is the cost of the effort dedicated to attaining a region's potential resource, $f(e^i)$. The crucial assumption that positive externalities flow into poor regions is premised on the idea that with the primary role of poorer jurisdictions being the provision of basic services and skills, competition induced interactions across regions will tend to be more beneficial to poor regions than richer areas where skills and services are more advanced and specialized. To simplify the derivation of the main results, effort levels are categorized as two types – $e^i = 1$ or $e^i = 0$, respectively. Depending on effort level chosen by region i

$$\text{Potential resource in region } i = \begin{cases} f(e^i) - c(e^i): & \text{if region } i \text{ makes effort} \rightarrow e^i = 1 \\ 0 \text{ otherwise}: & \text{if region } i \text{ selects no effort} \rightarrow e^i = 0 \end{cases}$$

Assuming that each region exercises its autonomy and behaves independently, a region i will have an incentive to make effort only when

$$f(e^i) - c(e^i) > 0 \tag{2}$$

More specifically, region i will undertake efforts to realize its potential resource if the marginal benefit of such an action exceeds the cost, i.e. when $f'(e^i) - c'(e^i) > 0$, where $f'(e^i) \equiv f(e^i = 1) - f(e^i = 0)$ and $c'(e^i) \equiv c(e^i = 1) - c(e^i = 0)$. If region i makes effort, $f(e^i)$ and $c(e^i) = 0$, yielding the condition in Eq.(2) above.

Inter-regional inequality will depend on how incentives inform the effort choices by regions, and the effect of such choices on income differentials between higher and lower-income jurisdictions within centralized and decentralized structures, respectively. Consider the case of a centralized fiscal system in which government can bailout regions that are poor *ex–post*, and have made no efforts *ex–ante* to avoid being poor. Assume for simplicity that the bailout program requires that resources of T^i be shifted from the only rich region – $\boldsymbol{R}$, to each of the n poor regions (P^1, P^2 ... P^n). Under such circumstances, a poor region P^i, will have no incentive to undertake a unilateral effort that could alter its low–income status when $f(e^i) - c(e^i) < T^i$. Note that if $f(e^i) - c(e^i) < T^i$ holds for all P^1, P^2 ... P^n, then *ex–post* income for a poor region P^i that exerts zero effort *ex–ante* can be expressed as

$$h^i = y^i + T^i \tag{3}$$

For the rich region with *ex–ante* fixed income level of Y, the effect of all n poor regions choosing $e^i = 0$ gives $\boldsymbol{R}$ an *ex–post* income of $Y - \sum_i^n T^i$. For simplicity of exposition and ease in solving the model, the n poor regions are assumed to be identical. Therefore, in the case of a centralized fiscal system where resources from a rich region ($\boldsymbol{R}$) can be used to fund the bailout transfers to n identical poor regions, the resulting income differential between both region types may be written as

$$\text{Inequality} = \underbrace{(Y - nT)}_{\textit{ex–post} \text{ income of rich region}} - \underbrace{(y + T)}_{\textit{ex–post} \text{ income of } n \text{ identical poor regions}} \tag{4}$$

Within a fiscally decentralized system, the devolution of revenue and expenditure responsibilities signals the central/national government's commitment not to bailout sub-national units. In this case, the absence of a mechanism for *ex–post* redistributive transfers will cause officials in poor regions to make an effort towards formulating policies that may increase potential income. With the rich region retaining its resource,

$$\text{Inequality} = \underbrace{(Y)}_{\textit{ex–post} \text{ income of rich region}} - \underbrace{(y + f(e) - c(e) + \alpha(n-1)f(e))}_{\textit{ex–post} \text{ income of poor regions when effort is exerted}} \tag{5}$$

Taking note of like terms (Y and y) in Equations (4) and (5), the question of which approach – fiscal centralization or fiscal decentralization, does a better job of reducing regional income differentials will depend on whether

$$nT + T \lesseqgtr f(e) - c(e) + \alpha(n-1)(f(e)) \tag{6}$$

The left-hand side of Eqn. (6) denotes the *standard* effect of the decrease in income differentials resulting from a system of intergovernmental transfers or bailouts, while the right-hand side captures the incentive effect on inter-regional inequality when fiscal decentralization acts as a commitment device. To achieve a greater decline in inter-regional inequality following fiscal decentralization, the

incentive effect has to exceed the *standard* effect. Mathematically, this condition is specified as

$$nT + T < f(e) - c(e) + \alpha(n-1)(f(e)) \tag{7}$$

For Eqn. (7) to hold, either $f(e^i)$ would need to be high or a relatively large degree of spillover (α) must occur across regions.[10] Thus, when the incentive effects exceed the standard effects, then fiscal decentralization will act as a commitment device that encourages effort by sub–national governments in reducing inter–regional inequality.

4 Empirical Methodology, Data and Results

To examine the relationship between inequality and fiscal decentralization across South Africa's 234 municipalities, our basic empirical model for the ith municipality in year t is specified as:

$$R_{it} = \vartheta + \beta D_{it} + \sum_{k}^{j} \gamma_j \mathbf{X}_{it} + \psi_i + \delta_t + \xi_{it} \tag{8}$$

where the dependent variable R denotes the measure of regional inequality, D represents the measure of fiscal and $\boldsymbol{X}$ is a vector of exogenous variables that account for non-decentralization factors assumed to influence inequality across municipalities. The subscript i is an index for a municipality, and t represents years (or time). To account for the effects of unobserved municipality–specific characteristics, the model includes municipal–specific dummies ψ_i; similarly, time–specific dummies, δ_t are included in Eqn.(8) to account for unobserved time–specific effects. Finally, ξ_{it} is the corresponding disturbance term that is assumed to be independent and identically distributed with zero mean and constant variance σ^2_{ξ}.

We note the following in relation to Eqn.(8). First, we use the Gini coefficient ($GINI$) to quantify the extent of inequality across the 234 municipalities. The justification for this choice is that the Gini coefficient measures the degree of spatial dispersion of income, and addresses three issues that make quantifying inequality difficult, namely: (i) the choice of an appropriate economic indicator to base the calculation of inequality on, (ii) ensuring that the analysis is carried out using a territorial classification that creates relatively homogeneous regions, and (iii) using a measure of inequality that is independent of both scale and population size while simultaneously satisfying the Pigou–Dalton principle.[11]

In addition to the measure of inequality across municipalities, there is also a need to include

[10] Note that when $\alpha = 0$ and $f(e^i) - c(e^i) < T^i$, the commitment device embodied in fiscal decentralization will not help to reduce inter-regional inequality. In this case, $nT + T < f(e) - c(e) + \alpha(n-1)(f(e))$ reduces to $nT + T < f(e) - c(e) \equiv nT < f(e) - c(e) - T$. As long as regions benefit more from transfers relative to making effort $\Rightarrow f(e^i - c(e^i) <^T i$, then $nT \not< f(e) - c(e) - T$ since $nT > 0$.

[11] As part of work relating the measurement of inequality (and poverty) to the axiomatic study of the properties of indices (quantifying inequality and poverty), the Pigou–Dalton principle of transfers posits that inequality decreases (or social welfare increases) when an even transfer is made from richer to a poorer regions without reversing their pairwise ranking. See Sen (1973) and Dalton (1920) for details.

appropriate measures of fiscal decentralization in the regression model. However, the task of finding a single quantitative measure of decentralization is made difficult by the complex and multi–dimensional process of intergovernmental relations (Schneider, 2003). In most of the empirical literature, the usual practice is to approximate fiscal decentralization using the sub–national share in consolidated general government revenues or expenditures. However, this approach does not (a) fully capture the degree of revenue and expenditure autonomy of sub–national governments, and (b) distinguish between the two types of decentralization – one that reflects the assignment of functions and resources to different levels of government, and that which merely reflects the relative size of sub–national government activities.

In this study, we follow the works of Lessman (2009) and Stegarescu (2005) and complement the traditional measures of fiscal decentralization – the shares of municipal revenues ($REVDEC$) and expenditures ($EXPDEC$), with improved, alternative measures of fiscal decentralization that take into account the vertical decision–making structures and sub–national autonomy with respect to tax revenues. The first alternative measure relates tax revenues of municipalities to consolidated government revenues adjusted for intergovernmental transfers ($TAXDEC$).[12] The second alternative measure of fiscal decentralization takes into account the relative importance of intergovernmental transfers in revenues of local governments in South Africa. Although transfers constitute less than 15% of total local revenues, disparities in resource endowment and fiscal capacities across municipalities has caused many local authorities to rely heavily on grant allocations from national government. We make the extent of vertical fiscal imbalance ($VIMB$) measured as the share of national transfers in municipal expenditures our preferred second alternative measure. Given that transfers provide a channel through which central (or national) authorities can influence budgets at local level, the measure reflects the degree of local government autonomy, and captures the extent of a municipality's reliance on transfers to finance key service delivery functions .

To account for the developmental role of municipalities in reducing inequalities, the regression model includes a vector of control variables (X) related to municipalities' socio–economic characteristics and indicated in empirical literature as potential explanatory variables affecting inequality across regions. The first of these controls are variables that measure the influence of regional development. The seminal work of Kuznets (1955) represents the first study to identify the process of a country's economic development as an important determinant of the long–term evolution in the distribution of national income. The work posited that the inequality characterizing income distribution exhibits a non–monotonic trend along the process of economic development such that the inequality gap widens as an economy transitions into an industrial period (or the earliest phases of economic development), before systematically decreasing as regions make advances in their level of

[12]This alternative measure relies on classification of tax autonomy by the Organisation for Economic Co–operation and Development (OECD) into two broad types: taxes determined by sub-national governments and revenues generated via tax sharing arrangements . In the former classification, sub–national units have discretion over either the tax rate or tax base, or both the tax base and rate. For the latter classification, revenue split is jointly determined by the central/national government in conjunction with sub-national units, or unilaterally determined by central government. For more details see Organization for Economic Co-operation and Development (OECD) (2002) and Ebel and Yilmaz (2003).

development. According to Williamson (1965), the observed inverted U shape suggests the presence of a non–linear relationship between economic development and regional inequality.[13] The regression model thus includes municipal per–capita income (Y^{pc}) as the measure of economic development, and its squared term as a quadratic function to test Kuznets hypothesis.

In recent years, models of the "new economic geography" have highlighted the importance of agglomeration economies in the relationship between economic development and regional inequality.A common interpretation of the Kuznets curve is that the inverted U pattern can be attributed to a systematic process of structural change in which there is an initial reallocation of labor from a stagnant poor rural and agricultural sector to an expanding urban industrial sector. With the mean and standard deviations of incomes in urban areas exceeding those of rural regions, this initial change will have the effect of increasing inter–regional inequality. In later stages of economic development, rising congestion costs from excessive concentration of industries within initially more developed regions will exhaust the benefits of agglomeration. Such congestion diseconomies coupled with the emergence of new locational advantages in rural or peripheral regions will lower income differentials (Dimou, 2008; Ros, 2000). In this paper, we control for agglomeration effects with municipal population density ($POPDEN$) and the degree of urbanization within a municipality ($URBAN$). Another control variable linking the concept of agglomeration to inequality is the sectoral composition of economic activity in a region. Regions with diversified economic bases are likely to be less vulnerable to adverse exogenous events such as bad climatic conditions and commodity price fluctuations, and have greater scope for random unemployment in one industry to be quickly offset by random hiring in other industries. To the extent that greater levels of employment ensure higher regional per capita incomes, the degree of economic diversification will have implications for regional inequality.[14] To take into account the sectoral composition of economic activity within each municipality, the vector of control variables includes the *tress* index ($TRESS$). Similar to *location quotients* that quantify and compare concentrations of industries in a particular area and provide insights into region's economic strengths and weaknesses, the tress index measures the level of diversification or concentration of a region's economy. [15]

Wealthier regions have a larger scope to implement redistributive policies using funding instruments mechanisms other than those provided by intergovernmental grant allocations and transfers. Furthermore, regions classified as farm–based economies display greater income inequality, and that the employment of a greater share of a region's labor force in the manufacturing sector is negatively correlated with income inequality (Lessman, 2009; Kuznets, 1955). These arguments suggest that extent of a region's economic size matters for regional inequality. To explore this hypothesis, the

[13] According to (Ezcurra and Pascual, 2008), the inverted U trend also suggests that progress in economic development can reduce regional inequality by contributing to the spatial dispersion of economic activity. Such dispersion results from factors such as the discovery of new resources in peripheral regions or the process of technological diffusion.

[14] Bonet (2006) suggests that agglomeration of production can directly cause income inequality, especially when there are restrictions on inter–regional labor migration or when the economy suffers from a surplus of labor.

[15] A tress index of zero represents a totally diversified economy; alternatively, the greater the index (i.e. the closer the index is to 100), the more concentrated or vulnerable a region's economy.

share of each municipality in South Africa's total Gross Value Added ($GVASH$) is included as an additional control in the regression analysis. Existing literature (see for example Alesina et al. (1999)) suggests that owing to heterogeneous preferences of various ethnic groups over the types of public services to finance with tax revenues, ethnic fragmentation within a particular region often creates difficulty for authorities to agree on public spending programs. Hence, the provision (or financing) of certain public goods such as education and sanitation is inversely related to ethnic fragmentation in those areas, an outcome that may promote divergence in the equality of regions. To capture such dynamics, the vector of controls includes an index of ethnic fragmentation ($ETHNIC$). Finally, related studies by Kim et al. (2003) and Akai and Sakata (2009) have shown that the levels of employment and human capital affects regional inequality. We evaluate the impact of these variables by including the unemployment rate ($UNEMP$) and the percentage of a municipality's population with a high–school diploma ($EDUC$) in the set of control variables. The descriptive statistics, definitions as well as source for the variables are summarized in Table 2.

Table 2 Definition of variables and descriptive statistics

Variables	Description	Mean(Std.Deviation)	Source
$GINI$	Gini coefficient	0.607 (0.035)	IHS Global Insight
$REVDEC$	Revenue decentralization measured as share of municipal revenues (including transfers) in total/consolidated government revenues	0.23% (0.010)	National Treasury (South Africa)
$EXPDEC$	Expenditure decentralization measured as municipal expenditures as % of consolidated government expenditures	0.2% (0.01)	National Treasury
$TAXDEC$	Tax decentralization measured as share of municipal tax revenues in consolidated government revenues	0.14% (0.01)	National Treasury
$VIMB$	Vertical imbalance measured by share of intergovernmental transfers in total municipal expenditures	38.9% (151.61)	National Treasury
$URBAN$	Urbanization rate	49.1% (0.347)	IHS Global Insight
$POPDEN$	Population density	97.29 (245.90)	IHS Global Insight
$TRESS$	Tress Index measuring diversification of economic activity	58.307 (11.72)	IHS Global Insight
$GVASH$	Share of municipality in national gross value added (GVA)	0.4% (0.017)	IHS Global Insight & National Treasury
$ETHNIC$	Ethnic fragmentation measured as $1-\sum_i(Ethnic_i)^2$	0.227 (0.194)	IHS Global Insight
$UNEMP$	Municipal unemployment rate	27.4% (0.130)	IHS Global Insight
$EDUC$	Municipal human capital measured by % of municipal population with high school diploma	11.4% (0.049)	IHS Global Insight

Data are *municipal -year* observations for 234 municipalities during the fiscal years 2003 - 2012.

5 Empirical Results

5.1 Estimation results

By following a panel data approach, this study endeavors to fully utilize both the time and cross–country dimensions of the chosen data set, which is a balanced panel data spanning a ten year period over the fiscal period 2003–2012. The estimation strategy differs from some of the empirical literature on the fiscal decentralization–regional inequality nexus (see for example **?** and **?**), which in order to capture the steady state relationship between dependent and explanatory variables, average out data over five or ten year horizons. As **?** suggests, averaging out data has two major drawbacks: (i) it does not always fully reflect the steady state equilibrium, and (ii) it represents a form of the smoothing out of time–series data, thereby removing from the data, useful variation that may help with more precise identification of the parameters of interest.

Eqn.(8) takes into account the possibility that there may exist municipality–specific effects that influence inequality across municipalities, but due to unobservability, are excluded from the set of explanatory variables. Failure to consider such effects may bias estimates and render results invalid. Estimating Eqn.(8) as a panel data model helps overcome this problem, as it includes a parameter of municipal–specific effects – ψ, that incorporates unobserved heterogeneity across municipalities. Depending on the different assumptions made about the municipality–specific effects, Eqn.(8) can be estimated as a random or fixed effects model. In this study, I proceed by estimating Eqn.(8) using the four different measures of fiscal decentralization, and including both random and fixed municipality–specific effects. Table 2.3 reports the results of the random–effects and fixed–effects estimates, respectively.

The different specifications indicate that the effect of decentralization on municipal inequality in South Africa vary according to the type of variable used to measure decentralization. When the proxy for fiscal decentralization is the share of municipal expenditures in consolidated (or total) government expenditures ($EXPDEC$), then fiscal decentralization tends to exacerbate existing inter–regional (or municipal) inequalities. In Model A, the fixed effects estimates show that the Gini coefficient of inter–regional inequality will increase by 0.82% (or 0.98% for the random effects estimation) if there were to be a 1% increase in $EXPDEC$ (i.e., a 1% increase in the share of the entire local government sphere in total government expenditures). The result is also statistically significant. A different result is however obtained when the measure of fiscal decentralization is derived using municipal revenues. In this case, the decentralization variable — $REVDEC$, has a negative and statistically significant coefficient. From the results of the fixed effect estimation in Model B, a 1% increase in a municipality's share of consolidated government revenues will reduce regional (or inter–municipal) disparities by 0.41% (or 0.23% in the case of random effects model).

Table 3 The impact of fiscal decentralization on inter–municipal inequalities

	Dependent variable: Gini Coefficient (2003—2012)							
	Model A		Model B		Model C		Model D	
	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects	Random Effects
LY^{pc}	0.03	0.01	0.02	0.01	0.02	0.01	0.03	0.01
	(0.019)	(0.012)	(0.018)	(0.011)	(0.018)	(0.011)	(0.019)	(0.011)
LY^{pc2}	0.002	0.002	0.002*	0.002	0.002*	0.002*	0.002	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
$URBAN$	- 0.06	- 0.01	-0.10	-0.01	-0.07	-0.01	-0.06	-0.003
	(0.055)	(0.018)	(0.057)	(0.018)	(0.056)	(0.019)	(0.055)	(0.018)
$LPOPDEN$	0.003	-0.002	0.01	-0.002	0.01	-0.002	0.004	-0.001
	(0.008)	(0.003)	(0.006)	(0.003)	(0.007)	(0.003)	(0.008)	(0.003)
$LTRESS$	-0.10***	- 0.02	-0.10***	-0.03	-0.10***	-0.02	-0.10***	-0.02
	(0.027)	(0.017)	(0.024)	(0.016)	(0.026)	(0.016)	(0.027)	(0.016)
$GVASH$	-1.59	-0.23	1.03	0.30*	-0.46	0.19	-1.76*	0.10
	(0.986)	(0.154)	(1.263)	(0.163)	(1.225)	(0.169)	(1.064)	(0.110)
$ETHNIC$	- 0.04	- 0.03	-0.10	-0.03	-0.08	-0.03	-0.05	-0.03
	(0.089)	(0.027)	(0.085)	(0.027)	(0.088)	(0.027)	(0.089)	(0.026)
$UNEMP$	0.04	0.01	0.07	0.01	0.05	0.01	0.04	0.006
	(0.047)	(0.033)	(0.043)	(0.027)	(0.043)	(0.033)	(0.045)	(0.032)
$EDUC$	0.11	0.15	0.10	0.14	0.11	0.15	0.11	0.16
	(0.171)	(0.099)	(0.167)	(0.10)	(0.175)	(0.10)	(0.177)	(0.10)
$EXPDEC$	0.82***	0.98**	—	—	—	—	—	—
	(0.386)	(0.453)	—	—	—	—	—	—
$REVDEC$	—	—	-0.41**	-0.23*	—	—	—	—
	—	—	(0.164)	(0.132)	—	—	—	—
$TAXDEC$	—	—	—	—	-0.38	- 0.20	—	—
	—	—	—	—	(0.289)	(0.210)	—	—
$VIMB$	—	—	—	—	—	—	- 0.0003	-0.0004
	—	—	—	—	—	—	(0.005)	(0.005)
Constant	0.74***	0.54***	0.78***	0.57***	0.81***	0.57***	0.79***	0.56***
	(0.201)	(0.081)	(0.194)	(0.082)	(0.194)	(0.082)	(0.193)	(0.081)
Municipal dummies	Yes	No	Yes	No	Yes	No	Yes	No
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2340	2340	2340	2340	2340	2340	2340	2340
R^2	0.014	0.252	0.027	0.233	0.001	0.238	0.026	0.252
F-test/$Wald$-test	17.90	315.17	18.52	313.99	17.59	303.78	17.38	299.57

The variables Y^{pc}, $POPDEN$ and $TRESS$ are expressed in natural logarithms. The numbers in parentheses are robust standard errors. (*), (**) and (***) denote statistical significance at the 10%, 5% and 1% levels, respectively. Time dummies (included in all equations) and municipal dummies (included in fixed effects regressions) are not reported. The respective F tests show that both time and municipal dummies are statistically significant across the four models. A dummy variable $URBAN$ that equals 1 if a municipality is classified as urban and zero otherwise included in the random effects estimations is insignificant across the four models and is also not reported.Hausman's test based on the difference between fixed and random effects gives the following results: χ^2 (19) = 34.14 with a p-value of 0.018 for Model A; χ^2 (19) = 42.45 with a p-value of 0.0015 for Model B; χ^2 (19) = 37.89 with a p-value of 0.0067 for Model C, and χ^2 (19) = 37.51 with a p-value of 0.007 for Model D.

A major concern with the results reported in Table 2.3 is the possibility that an endogenous relationship between of inter–municipal inequality and fiscal decentralization may cause the fixed and random effects estimates to be biased and inconsistent. According to the political science literature on the territorial and institutional dimensions of inequality and resource redistribution (see for example **?**), there are valid reasons to suspect that fiscal decentralization may have an endogenous relationship with income inequality. **?** argues that one such reason is that the choice between competing administrative (and fiscal) systems (such as centralization versus decentralization) is shaped by knowledge about the distribution of resources and structure of inequality across regions or territories. Furthermore, the differing ideologies regarding how best to redistribute income and address inequalities implies the existence of a political process according to which the structure of inequality shapes the levels of decentralization. For example, demand for greater decentralization in a country may be driven by regions that have "socialist" leanings, and thus a higher preference for implementing redistributive policies relative to what obtains at the central/national level (**?**). Similarly, within a federal system, concerns over distribution of income and increasing regional inequalities might cause the a central/national government to take one of two approaches: (i) increasingly centralize budgets in order to have an increased scope to implement redistributive programs, or (ii) where it believes decentralized decision–making is essential for regional convergence, implement a policy of fiscal decentralization (**?**). Hence, knowledge of differences as well as the structure of regional inequalities, coupled with the political/ideological views on the best approaches to reducing inequalities may help shape preferences for fiscal decentralization and the actual extent of its implementation (**?**) .

To tackle the problems of the possible endogeniety of fiscal decentralization, I use an instrumental variable (IV) in a two–stage least squares (2SLS) estimation of Eqn.(7). The application of the 2SLS approach is made difficult by the requirement that the chosen instrument satisfy dual conditions of being an exogenous determinant of fiscal decentralization, which is uncorrelated with the extent of regional inequalities. In the empirical literature, the standard variables used to instrument include lagged values of the measures of decentralization (see for example, **?**), the size of regions (see for example, **?** and **?**), or the degree of ethnolinguistic fragmentation (see for example, **?**). In this study, I follow **?** and instrument decentralization using variables reflecting the institutional and historical dynamics that have shaped how fiscal decentralization affects inter–municipal inequalities in the context of South Africa.

The first variable I choose as an instrument of fiscal decentralization is the share of whites in a municipality's population ($WHITE$). Historically, the concept of decentralization in South Africa can be traced back to 1910 Union constitution which transformed the existing colonies of the Cape, Transvaal, Orange Free State and Natal into provinces and powers to manage local or special affairs, including education, health and transportation facilities. Furthermore, the 1910 Constitution granted provincial authority over a general framework of local government that consisted of municipalities for the major towns, divisional councils for the major districts, and a village council (or sanitary board) for rural centers of population(**?**). During apartheid, the segregated system of

administration meant that relative to administrative bodies governing black citizens, white South Africans enjoyed considerable autonomy within their decentralized governance structures. Following the British model, white local authorities (WLAs) with their own dedicated bureaucracies were established in all urban areas. The functions carried out by WLAs included water and electricity reticulation, refuse removal, sewerage disposal, low cost housing schemes, urban planning, traffic control and public health inspections. The costs of these services were financed through revenues generated from a combination of user charges, profits from commercial services (in particular electricity reticulation) and property taxes (**?**).

The effects of the apartheid dispensation is reflected in operations of decentralized functions at municipal level. Municipalities located in more affluent urban areas that previously included the WLAs and black urban areas within the WLAs, are generally the best performing local governments that are able to avail themselves of existing revenue sources and support grants. In contrast, many municipalities covering rural areas and incorporating much of the former homelands continue to battle with challenges related to the legacy of apartheid, which neither trained nor prepared individuals for senior positions in the structures of local government. For such municipalities, the lack of skilled and experienced personnel has created severe constraints that have adversely affected their administrative effectiveness as well as functioning of operations related to service delivery programs. The share of the white population helps reflect the influence of white South African's prior experience with decentralization, and how such experience has diffused into current structures that integrated previously segregated areas. Hence, municipalities with a historical link to previous WLAs that experienced greater decentralization are expected to have a higher degree of decentralization.[16]

The second variable I use to instrument fiscal decentralization is a dummy variable, $CLASS$, that captures the sub–classification of municipalities within the local government sphere (see Table 2.4).[17]Although the Constitution provides for asymmetry in the form of three categories of municipalities, the comprehensive frameworks for functional competencies, governance and financial management, as well as policy targets are applied uniformly irrespective of the vast capacity and economic differences between municipalities. Despite this uniform application, the asymmetry in operational capacity has created variations in the extent to which municipalities exercise their Constitutionally assigned powers and functions. For example, Section 229 of the 1996 guarantees that rates levied on property will form an autonomous source of revenues for municipalities, and that such revenues will fund economic services such as municipal roads, street lighting and street cleaning. In levying rates on properties, municipalities must comply with the requirements of the Municipal

[16]A similar approach is followed by **?** who notes that idea of fiscal federalism can be perceived as an European invention that was spread across the world through colonial activities and how settler populations organized their administrative structures. Based on expectation that countries with a historical link to Western Europe should have a higher degree of decentralization, **?** uses the share of the population that speaks a major European language as one of the instrumental variables for fiscal decentralization.

[17]Following the definitions listed in Table 2.4, the regional classification of a municipality are as follows: 1= metropolitan area; 2 = municipality with major secondary cities; 3= municipality with small or medium town(s) as its main centre(s), and 4= rural municipality.

Property Rates Act (2004) which stipulates: (i) metropolitan and local municipalities as the only local authorities that may levy a property tax, and (ii) that authorized municipalities adopt efficient property rates policies including establishing and maintaining a property valuation roll, and ensure that valuations meet the minimum standards for a fair and consistent property tax system. Owing to problems with extending property rates to tribal lands and the lack of experienced personnel to conduct periodic assessments and maintain valuation rolls, many municipalities categorized as types $B3$ and $B4$ operate much weaker property rates tax base and relative to authorities classified as types A and $B1$, collect about half of the potential rates in revenue.

Table 4 Categorization and sub–classification of South Africa's municipalities

Category	**Number**	**Description**
(**A**) Metropolitan municipalities	8	Large urban complexes with populations over 1 million and accounting for over 50% of all local government spending
(**B**) Local municipalities		
· (B1) Secondary cities	19	Local municipalities with the highest operating budgets and a large urban spatial pattern
· (B2) Large towns	27	Local municipalities with a large town as its urban core
· (B3) Small to medium towns	100	Local municipalities with small towns, and relatively small % of its population residing in smaller urban settlements, but with no large town as a core
· (B4) Mainly rural ares	70	Areas characterized by the presence of no more than two small towns in their areas, communal land tenure and villages or scattered groups of dwellings and typically located in former homelands
(**C**) Districts		
· (C1) District municipalities without powers	24	Municipalities not assigned powers and functions of water and sanitation provision
· (C1) District municipalities with powers	20	Municipalities assigned powers and functions of water and sanitation provision
Total	278	Local Government Sphere

Source: **?**, and *Author's own calculations*

Similarly, compared to urban and large towns, many smaller municipalities lack the necessary economies of scale, skills and specialization to provide water and electricity services efficiently and effectively. As a result of these difficulties with infrastructure and technical capacity, as well as the limited scope for municipalities to generate revenue from poor areas, many category $B2$ and $B3$ municipalities have been slow in services extending electricity services to poor households.[18]. Including dummy variables for the different municipal categories (excluding districts) helps capture

[18] According to Statistics South Africa's Non–financial Census of Municipalities for 2009, 56 local municipalities did not provide any electricity to their residents and instead, depended solely on the national electricity utility company – Eskom, to carry out the function of distributing electricity within their jurisdictions. Of these municipalities, 43 were large rural municipalities with relatively dense rural populations and only small core towns, 11 were rural municipalities in low density rural areas and small towns, while the remaining two municipalities were large towns.Given

the extent to which local authorities can fully maximize their assigned decentralized functions and implement policies that can reduce inequalities. Thus, municipalities classified as type A or $B1$ are expected to be more decentralized, and better able to take advantage of decentralized powers and functions granted by the 1996 Constitution in addressing inequality.

Given that the equation of interest – Eqn.(8), contains an endogenous explanatory variables as well as unobserved heterogeneity in the form of municipality–specific effects, the IV estimates are obtained using the fixed effects two stage least squares (*FE–2SLS*) method. Also, an alternative method to dealing with the endogeneity problem is to estimate a random effects two–stage least squares (*RE–2SLS*) model, which yields estimates that are a matrix–weighted average of coefficients obtained from the between 2SLS and FE–2SLS methods, respectively.[19] Both estimators are applied to the regression analysis of the versions of Eqn.(8) that include the different measures of fiscal decentralization. To decide between both effects, **?** suggests a Hausman test based on the difference between the FE–2SLS and RE–2SLS estimators.[20] On the basis of the statistical significance of the chi-square distribution, this alternative Hausman test rejects for modes B and C, the null hypothesis that the RE–2SLS yields a consistent estimator of Eqn.(8) and instead, selects the FE–2SLS as a viable estimator whose consistency cannot be rejected. The opposite is however the case for models A and D, respectively.[21]

The upper part of Table 2.5 reports the results of the second-stage regressions, while the lower part presents a summary of the first–stage regression diagnostics that assesses the validity of the chosen instruments. With the exception of the coefficients of variables measuring economic development in a municipality (Y^{pc} and its squared term), the effect of the control variables on inequality are statistically significant across the multiple estimates of Eqn.(8). Columns (2) and (3) show that for revenue based measures of fiscal decentralization, urbanization impacts negatively and significantly on inter–municipal inequality. This is consistent with the argument that since increased urbanization is often regarded as a sign of rising economic development, then greater transformations of municipal areas into urban centers should reduce income inequality (Kuznets, 1955). Similarly, columns (1) and (4) show that for expenditure based measures of fiscal decentralization, increases in population density lower regional disparities. The coefficient for the other measure of agglomeration, the log of $TRESS$, indicates that while the effect of an increased diversification of industrial activities is significant, its magnitude depends on both the regression estimator and the measure of fiscal decentralization. When random effects estimation is applied to versions of Eqn.(8)

the high levels of poverty and unemployment in these municipalities, the will appear to suggest that it is usually the case that most rural municipalities with the least alternative sources of own revenue that do not supply electricity to their residents and therefore cannot use this as a source of revenue (**?**)

[19]The *RE–2SLS* produces the same results as the generalized two–stage least squares (*G2SLS*) but with standard errors that are lower and slightly more robust.

[20]The standard Hausman test is based on the contrast between fixed and random effects, assuming that the endogeneity is solely due to correlation between municipal–specific effects and regressors. This does not account for the endogeneity that results from a simultaneous type relationship between regional inequality and fiscal decentralization. The alternative Hausman test helps address this shortcoming.

[21]The alternative Hausman test gives the following results: χ^2 (18) = 3.08 with a p-value of 0.97 for Model A; χ^2 (18) = 39.91 with a p-value of 0.002 for Model B; χ^2 (19) = 36.41 with a p-value of 0.01 for Model C, and χ^2 (19) = 0.29 with a p-value of 0.99 for Model D.

that include expenditure and transfers based indicators of fiscal decentralization (columns (1) and (4), respectively) higher levels of industrial diversification will result in increased inter–municipal inequality. In contrast, fixed effects estimates of versions of Eqn.(8) that incorporate revenue based measures of fiscal decentralization show that greater industrialization has a negative and significant effect on regional inequality (see columns (2) and (3), respectively). The observed ambiguity regarding the impact of industrial diversification on inequality is consistent with *a priori* expectations. While a diversified industrial base may provide less–skilled labor with opportunities to earn relatively high wages, thus reducing inter–regional inequalities (**?**), it is also possible that a tendency for service–producing industries with bimodal wage distributions to concentrate in particular areas (such as well developed metropolitan/urban centers) may result in a positive relationship between regional inequality and the measure of industrial diversification (**?**).[22]

Table 5 Panel data estimates using the instrumental variable approach

	Dependent variable: Gini Coefficient (2003—2012)			
	Model A	Model B	Model C	Model D
	RE–2SLS	FE–2SLS	FE–2SLS	RE–2SLS
	(**1**)	(2)	(**3**)	(4)
LY^{pc}	0.02*	0.02	0.01	0.01
	(0.009)	(0.019)	(0.02)	(0.01)
LY^{pc2}	-0.001	0.002	0.001	-0.001
	(0.002)	(0.002)	(0.001)	(0.002)
$URBAN$	0.01	-0.15***	-0.16***	-0.003
	(0.008)	(0.041)	(0.044)	(0.010)
$LPOPDEN$	-0.003***	0.01	0.01	-0.004***
	(0.001)	(0.006)	(0.01)	(0.001)
$LTRESS$	0.03***	-0.08***	-0.09***	0.04***
	(0.009)	(0.023)	(0.023)	(0.001)
$GVASH$	-1.59***	6.87**	7.56**	0.18***
	(0.511)	(2.76)	(3.09)	(0.058)
$ETHNIC$	- 0.06***	-0.22**	-0.26**	-0.05***
	(0.012)	(0.086)	(0.098)	(0.011)
$UNEMP$	-0.02	0.132**	0.0123*	0.039**
	(0.02)	(0.051)	(0.053)	(0.019)
$EDUC$	0.27***	0.10	0.073	0.23**
	(0.065)	(0.151)	(0.158)	(0.067)
$EXPDEC$	5.08***	—	—	—
	(1.495)	—	—	—
$REVDEC$	—	-1.24**	—	—
	—	(0.367)	—	—

Continued on next page

[22]This latter argument can also be used to explain the alternative possibility that higher levels of urbanization may cause greater regional inequality.

Table 5 – *Continued from previous page*

	Model A	Model B	Model C	Model D
	RE–2SLS	FE–2SLS	FE–2SLS	RE–2SLS
	(**1**)	(2)	(**3**)	(4)
$TAXDEC$	—	–	-2.69***	—
	—	—	(0.828)	—
$VIMB$	—	—	—	-0.06**
	—	—	—	(0.026)
Constant	0.35***	0.76***	0.89***	0.45***
	(0.063)	(0.011)	(0.215)	(0.059)
First stage regression diagnostics				
Observations	2340	2340	2340	2340
Partial R^2	0.415	0.413	0.356	0.453
AP–$F^{\dagger}$	4.33	34.92	50.55	5.04
$Prob > F$	0.0019	0.000	0.00	0.00
Hansen $J^{\ddagger}$	25.52	0.00	0.00	2.166
Hansen $J(p-value)$	0.00	–	–	0.5387
Excluded instruments from overidentification test of all instruments				
	$CLASS$ $WHITE$	$WHITE$	$WHITE$	$CLASS$ $WHITE$

Note: Model A is the version of Eqn. (8) that uses $EXPDEC$ as the measure of fiscal decentralization. Similarly, Models B, C, and D are versions of Eqn.(8) that use $REVDEC$, $TAXDEC$ and $VIMB$ as the chosen measures of fiscal decentralization, respectively. The variables Y^{pc}, $POPDEN$ and $TRESS$ are expressed in natural logarithms. The numbers in parentheses are robust standard errors. (*), (**) and (***) denote statistical significance at the 10%, 5% and 1% levels, respectively. Time dummies (included in all equations) and municipal dummies (included in fixed effects regressions) are not reported. † denotes the Angrist-Pischke (AP) multivariate F test of excluded instruments; ‡ is the Hansen J–statistic from the overidentification test of all instruments.

With the exception of Model A, the coefficient for a municipality's share of national economic activity ($GVASH$) is positive and statistically significant. A possible explanation could be that municipalities that experience economic growth can grow their revenue streams relative to those that either remain economically stagnant or experience an economic decline. In such a scenario, regional inequalities may worsen. The effect of ethnic fragmentation in inequality is consistent across all the different estimators of Eqn.(8), as Columns (1)–(4) show that a greater degree of ethnic fragmentation is negatively correlated with regional (inter–municipal) inequality. As expected, higher unemployment rates are associated with higher levels of inter–municipal inequality. According to **?**, the prevalence of low–level education across all regions reduce inequality, while the prevalence of high–level education that promotes productive human capital accumulation increases inequality. The positive coefficient on $EDUC$ in columns (1) and (4), respectively, suggests that the latter effect dominates in the context of South Africa's municipalities. The differing coefficients and levels of significance do not allow for a coherent picture of the effect of Y^{pc} (as well as its squared term) to emerge. Nonetheless, the results do not support the Kuznets (1955) and Williamson (1965) hypothesis of a bell– shaped relationship between regional inequalities and economic development in the 234 municipalities considered in the study.

Important conclusions emerge from the estimated coefficients of the measures of fiscal decentralization. Column (1) shows a positive and statistically significant relationship between the expenditure based measure of fiscal decentralization and inter–municipal inequality. Holding all other factors constant, a 1% increase in the municipal share of total government expenditure contributes to a 5.08% increase in the value of the Gini coefficient. On the contrary, columns (2) – (4) show a negative and statistically significant relationship between the broad and narrow revenue based measures of decentralization and inequality across the set of municipalities considered in the study. The FE–2SLS estimator of Model B shows that a 1% increase in sub–national share of total government revenues (adjusted for intergovernmental transfers) contributes to a 1.24% reduction in the value of the coefficient for $GINI$; in column (3), a similar 1% increase in the share of municipalities' tax revenues in consolidated government earnings would cause the Gini coefficient of inter–municipal inequality to decline by almost 3%. Finally, Constitutional imperatives to reduce inequality, as reflected in $VIMB$, does play some role in enhancing overall equity; a 1% increase in the share of intergovernmental transfers in total municipal expenditures will reduce inter–municipal inequality by 0.06%. The main inference one can draw from these results is that the relationship between fiscal decentralization and regional inequality within South Africa's local government sphere is dependent on the variable used to measure decentralization.

When the measure of decentralization is expenditure based, the resulting positive and significant relationship between inequality and fiscal decentralization is consistent with the hypothesis that owing to a weakened redistributional capacity of national government, fiscal decentralization results in increased regional inequality. On the other hand, the negative and statistically significant coefficient of the revenue and transfer based measures of decentralization ($REVDEC$, $TAXDEC$ and $VIMB$) provides evidence supporting the role of fiscal decentralization as a commitment device, which serves to reduce regional disparities in South Africa's local government sphere. Turning to the interpretation of the first–stage regression diagnostics, the results for the Angrist–Pischke multivariate F-test of excluded instruments, which is a test of weak identification, indicates that the instruments are meaningful and thus do not suffer from a weak instrument bias ($F > 10$) for the degree of revenue decentralization [columns (2) and (3)]. For both the transfer based measure of decentralization and the degree of expenditure decentralization [columns (4) and (1)], respectively, it is quite close to 5 and suggests that the instruments can to some extent, be considered meaningful. Finally, with the exception of column (1), the the test of overidentifying restrictions (the Hansen J–statistic) does not reject the null hypothesis that the chosen instruments ($CLASS$ and $WHITE$) are exogenous.[23]

Given the range of legislative and policy reforms aimed at improving the effectiveness and capacity of municipalities to meet their developmental role, why has expenditure decentralization failed to reduce regional disparities in South Africa? One argument to explain the positive link between fiscal decentralization and regional inequality is that as a broad measure, $EXPDEC$ does not distin-

[23]Note that the Hansen J–statistic is derived using the estimator applied to each model. The fixed effects estimations of models B and C treats the categorical variable ($CLASS$) as collinear and thus, drops it from regressions for the overidentification test. Both Models B and C are therefore exactly identified.

guish between spending on recurrent items (such as wages and salaries) and expenditures on capital projects. Likewise, it does not distinguish infrastructure spending from spending directed towards welfare and social security. Within the literature on economic growth, it is a well–known fact that a positive relationship exists between economic growth and capital (as well as infrastructure) spending by government (see for example **??**). Hence, excessive spending by sub–national governments on unproductive items, even if optimal, can limit or even reduce economic growth. In this respect, it must be noted that underspending of resources has become a consistent and problematic feature of municipal budgets in South Africa. For example, municipal underspending of capital budgets amounted to ZAR8.5 billion (or 8.9% of total capital budget), ZAR18.9 billion (or 29.4% of total capital budget) and ZAR14.8billion (32.3% of total budgets) in each of the three financial years between 2009 and 2012, respectively .Of the total capital budget allocated to 21 secondary cities, about R2.9-billion, or 44%, was underspent during the period between 2009 and 2012, with more than half of all district municipalities and 111 local municipalities found to be the worst performers as they consistently underspent their respective capital budgets by more than 30% (**?**).

Much of the trend in underspending can be attributed to capacity difficulties including poor capital budgeting and planning; a shortage of planners and engineers able to draft appropriate specifications and prepare project tenders of sufficient quality; inadequately managed procurement processes; political interference in procurement processes, and uncertainty arising from the reluctance of officials to take spending decisions owing to political considerations. The argument can therefore be made that for the case of South Africa, the observed inequality increasing effect of expenditure decentralization may be due to the failure of efficiency gains to materialize due to constraints placed by skills scarcity and weak administrative capacity on the expenditure decisions of local governments. **?** points out that the notable consequences of underspending, particularly on capital investments and infrastructure, have included a the deteriorating reliability and quality of municipal services; rising costs of maintenance and refurbishment of critical socio–economic infrastructure; a reduction in the useful lifespan of assets; overwhelming service delivery backlogs, and reduced revenues owing to the failure of selling an adequate level of municipal services. Together, these factors can be expected to limit the developmental role envisaged for municipalities and by extension, the capacity of many authorities within the local government sphere to effectively implement policies and spending programs that can reduce existing levels of inequality.

5.2 Robustness analysis

The first set of robustness checks involves using an alternative variable to instrument fiscal decentralization. Although the the size of a region does not seem to be related with income distribution, it represents the degree of spatial dispersion and decay of central public services to regions and has thus been identified as an important determinant of fiscal decentralization (see for example **?**, **?** and **?**). To this end, Table 2.6 presents the results obtained when the empirical model [Eqn.(8)] is restimated using estimators in which the the expenditure, revenue and transfer based measures of fiscal decentralization are instrumented with two variables: (i) the size of a municipality, which is

represented by the log of geographical area measured as square kilometers ($LAREA$), and (ii) the share of the white population ($WHITE$).

Table 6 Robustness Check: Estimating Eqn.(8) Using Log of Area and Share of Whites as Instruments

	Dependent variable: Gini coefficient (2003–2012)			
	Model A	Model B	Model C	Model D
	RE–2SLS	FE–2SLS	FE–2SLS	RE–2SLS
	(**1**)	(2)	(**3**)	(4)
Y^{pc}	0.23	0.02	0.01	0.01
	(0.015)	(0.019)	(0.021)	(0.01)
LY^{pc2}	0.002	0.001	0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)
$URBAN$	-0.01	-0.15***	-0.15***	0.01
	(0.019)	(0.041)	(0.043)	(0.01)
$LPOPDEN$	-0.003	0.01	0.01	-0.002**
	(0.003)	(0.007)	(0.01)	(0.001)
$LTRESS$	-0.02	-0.08***	-0.09***	0.03***
	(0.02)	(0.023)	(0.023)	(0.01)
$GVASH$	-2.18***	6.89**	7.06**	0.15**
	(0.777)	(0.023)	(3.028)	(0.057)
$ETHNIC$	-0.05	-0.22**	-0.25**	-0.05***
	(0.031)	(0.086)	(0.096)	(0.010)
$UNEMP$	-0.01	0.133**	0.12**	0.02
	(0.036)	(0.051)	(0.052)	(0.019)
$EDUC$	0.16	0.09	0.08	0.27***
	(0.13)	(0.151)	(0.157)	(0.067)
$EXPDEC$	6.91***	–	–	–
	(2.291)	–	–	–
$REVDEC$	–	-1.25***	–	–
	–	(0.367)	–	–
$TAXDEC$	–	–	-2.55***	–
	–	–	(0.811)	–
$VIMB$	–	–	–	-0.02
	–	–	–	(0.028)
$Constant$	0.43***	0.76**	0.89***	0.42***
	(0.127)	(0.204)	(0.213)	(0.059)
First stage regression diagnostics				
Observations	2340	2340	2340	2340
Partial R^2	0.62	0.68	0.72	0.39
AP–$F^{\dagger}$	0.28	19.11	30.66	0.60
$Prob > F$	0.755	0.000	0.00	0.548
Hansen $J^{\ddagger}$	0.08	0.20	0.71	4.16

Continued on next page

Table 6 – *Continued from previous page*

	Model A	Model B	Model C	Model D
	RE–2SLS	FE–2SLS	FE–2SLS	RE–2SLS
	(**1**)	(2)	(**3**)	(4)
Hansen $J(p-value)$	0.774	0.654	0.40	0.041
Excluded instruments from overidentification test of all instruments				
	LAREA	*LAREA*	*LAREA*	*LAREA*
	WHITE	*WHITE*	*WHITE*	*WHITE*

Note: The numbers in parentheses are robust standard errors. (*), (**) and (***) denote statistical significance at the 10%, 5% and 1% levels, respectively. Time dummies (included in all equations) and municipal dummies (included in fixed effects regressions) are not reported. *LAREA* is the *log* of the municipal size in square kilometers. † denotes the Angrist-Pischke (AP) multivariate F test of excluded instruments; ‡ is the Hansen J–statistic from the overidentification test of all instruments.

In general and relative to the findings reported in Table 2.5, the results in Table 2.6 show no substantial change to the signs and statistical significance of the coefficients of the control variables. For instance, columns (2) and (3) indicate that higher levels of unemployment are associated with higher inter–municipal inequality. Also, the more diverse and urbanized municipalities are, as reflected by $ETHNIC$ and $URBAN$, respectively, the lower the extent of regional inequality. Shifting the focus to the effect of the different decentralization measures and regression diagnostics, the results show that the impact of fiscal decentralization on inter–municipal inequality is robust to the inclusion of a different instrument. The coefficient of fiscal decentralization is negative and statistically significant when revenue based measures, $REVDEC$ and $TAXDEC$, are included in the regression analysis of the specified empirical model (see columns (2) and (3), respectively). In contrast, the coefficient of the decentralization measure reflecting expenditure responsibilities of municipalities, $EXPDEC$, remains positive and statistically significant [see column (1)]. Overall, these results confirm the earlier conclusion that the impact of fiscal decentralization on inequality across municipalities will vary according to how fiscal decentralization is measured.

A potential critique of the above results is centered on the measure of regional inequality. Within the income distribution literature, it has become a stylized fact that owing to a variety of approaches to aggregating information contained in distributions of variables such as welfare and inequality, different inequality measures may actually yield multiple orderings of the income distribution indicies one seeks to compare (Ezcurra and Pascual, 2008; Sen, 1973). Ensuring that results obtained in Table 2.5 are not sensitive to how inequality is measured makes repeating the instrumental variable estimation of Eqn.(8) a worthwhile exercise. As such, rather than use the Gini coefficient as the preferred measure of the dependent variable, the second set of robustness checks makes use of measure of inequality based on the concept of the relative share of fiscal resources. Following **?** and Bonet (2006), this measure is mathematically expressed as:

$$AdjI_{i,t} = \left| \frac{\frac{Y_{it}}{Pop_{it}}}{\frac{\sum Y_{it}}{\sum Pop_{it}}} - 1 \right| \equiv \left| \frac{y_{it}}{\sum y_t} - 1 \right| \tag{9}$$

where Y_{it} is the financial resources available in a region i at time t, and Pop_{it} is the population of

region i in period t. In this study, income is used as the measure of available fiscal resources. If the ratio of the share of income to the share of population of a region i is defined as that region's per capita income (or its relative share of fiscal resources), then the inequality measure in Eqn. (8) represents the absolute value of the distance from the relative share to the perfect equal share (i.e., where the perfect equal share has a value of one).[24]In an ideal situation where there is no inequality or where perfect equality holds, then, the per capita income of the i^{th} region should equal the overall (or national) average for all regions in a given year. For regions with an initial per capita income greater than than one, an increase in their share suggests that decentralization results in increased inequality, while a decrease indicates more equity in the distribution of income. By the same token, inequality would increase if regions with an initial relative share of less than one experienced further reductions in their shares. The larger the distance (from the relative shares to the perfect share of one) in absolute terms, the greater the extent of regional income inequality. Similar to the strategy used to derive the estimates reported in Tables 2.5 and 2.6, the results of the IV regression, where the dependent variable is the adjusted measure of inequality ($AdjI$) and both $CLASS$ and $WHITE$ are used to instrument the different measures of fiscal decentralization, are reported in Table 2.7.

[24]Other measures, which satisfy the Pigou–Dalton transfer principle and are widdely used in the literature include coefficient of variation (CV), the population–weighted coefficient of variation (WCV) and the Theil index. However, their use in this study is precluded by the lack of detailed data, in terms of both subject (municipalities) and time dimensions. It is also important to note the argument by **?** which states that conceptually, these alternative measures may not be superior to the measure specified in Eqn.(8), especially as this alternative inequality measure fully reflects how a given region is advantaged/disadvantaged in terms of fiscal resources relative to other regions.

Table 7 The effect of fiscal decentralization on inter–municipal disparities using an alternative measure of inequality

	Measure of fiscal decentralization			
	$EXPDEC$ (**1**)	$REVDEC$ (**2**)	$TAXDEC$ (**3**)	$VIMB$ (4)
Estimation method	RE–2SLS	RE–2SLS	FE–2SLS	RE–2SLS
Coefficient	98.77**	-5.33***	-9.76***	-0.002
	(15.20)	(0.513)	(0.932)	(0.002)
First–stage regression diagnostics				
Partial R^2	0.273	0.249	0.231	
AP–$F^{\dagger}$	1.08	8.79	8.94	
$Prob - F$	0.366	0.00	0.000	
Hansen $J^{\ddagger}$	5.039	22.353	17.698	
Hansen $J(p - value)$	0.169	0.001	0.001	

Note: The numbers in parentheses are robust standard errors. (*), (**) and (***) denote statistical significance at the 10%, 5% and 1% levels, respectively. All the regressions include time–specific effects, and the following control variables: the urbanization rate, the log of population density, log of the Tress index, municipal share in national gross value added (GVA), the degree of ethnic fragmentation, the unemployment rate and the share of the population in a municipality with a high school diploma. The log of per capita income and its squared term were excluded to avoid the problem of multicollinearity. For all measures of fiscal decentralization, instruments used are dummy variable capturing the categorization of a municipality, and the share of whites in municipal population.

† denotes the Angrist-Pischke (AP) multivariate F test of excluded instruments; ‡ is the Hansen J–statistic from the overidentification test of all instruments.

For purposes of brevity, Table 2.7 does not present the entire estimation output and instead, reports the main findings related to the coefficients of the different decentralization measures and first–stage regression diagnostics. The results in columns (2) and (3) show that revenue based measures of fiscal decentralization ($REVDEC$ and $TAXDEC$, respectively) have a significantly negative effect on the alternative measure of inter–municipal inequality. On the other hand, the results show a positive and statistically significant relationship between the expenditure based measure of fiscal decentralization and the alternative measure of inequality across South Africa's 234 municipalities.[25] Importantly, the qualitative nature of the main results with respect to the effects of fiscal decentralization remain unaltered from the primary findings reported in Table 2.5. Hence, the results are robust to both different instruments and alternative measures of inter–municipal inequality. To sum up, the regression analysis provides strong evidence that the measurement of fiscal decentralization determines its effect on regional inequality. For the case of South Africa, revenue decentralization has a negative impact on inequality (i.e., it lowers inter–municipal inequality), while expenditure decentralization contributes to worsening regional inequality.

[25]The manner in which the calculation of the alternative measure of inequality is carried out requires the coefficients of the decentralization measures be divided by 100 to derive the actual values of the coefficients.

6 Concluding Remarks

The purpose of this study was to analyze the effects of fiscal decentralization on inter–municipal inequalities across the 234 municipalities that constitute South Africa's local government sphere. To facilitate the analysis, I rely on a theoretical model of fiscal decentralization, where the devolution of fiscal powers away from to sub–national units acts as a commitment device that motivates sub–national authorities to implement policies to reduce inter–regional inequality. The theoretical predictions are tested using a panel data covering the period 2003–2012. The result of the empirical analysis provides evidence of a statistically significant relationship between fiscal decentralization and inequality in the context of South Africa's municipality. Specifically, the nature of the relationship depends on how fiscal decentralization is measured. Where measures of fiscal decentralization are revenue based, the regression estimates support the hypothesis that the commitment device of fiscal decentralization provides incentives that decrease inter–municipal inequality. On the other hand, expenditure based fiscal decentralization contribute to increased inter–municipal disparities. This conclusion is robust to alternative estimation strategies and methods.

In recent years, questions have been raised on whether the current functions and powers of local government are sufficient for to achieve the developmental mandates set out in the Constitution. As the representative government closest to citizens, there has been increased demand for the transfer certain functions, such as housing, public transport and land use planning to municipalities. However, as the regression results have shown, increased expenditure decentralization may actually worsen inter–municipal inequality, particularly given limited planning resources and inadequate capacity issues faced by a number of municipalities. Policies aimed at having municipalities take up increased responsibilities for implementing inequality reducing expenditure programs must acknowledge the existence of large variations in capacity levels across the 234 metropolitan and local municipalities. A more pragmatic approach could be a policy that places emphasis on ensuring that municipalities are able to focus on those responsibilities that they are able to deliver on. This would mean that certain municipalities ought to focus on a smaller set of functions while other municipalities could expand their expenditure focus. In this regard, ongoing discussions on the practicalities of implementing a differentiated approach, which takes into account the different capacities at the local sphere when devolving additional expenditure and revenue functions to municipalities will be of positive benefit to reforms targeting the improved efficiency of South Africa's intergovernmental fiscal relations.

While this work presents some important findings, there is still room for future research. First, the data used in this study suffers from not being able to disaggregate municipal expenditures into its various components such as capital and recurrent spending. As the impact of expenditure on economic growth and inequality can not be examined in isolation of the different spending categories, future research should examine how the different types of expenditure allocated by municipalities affect inter–municipal inequality. Second, this study does not capture the political dimension of fiscal decentralization. South Africa's municipalities are administered by different political parties, with each party having distinct ideologies on how to exercise their exclusive and concurrent mandates.

Thus, a possible opportunity for future research would be to test whether groups of municipalities governed by a specific political party exhibit greater (or lesser) inequalities than those administered by other political parties.

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