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**Putting the economy in its place:**

**Geographical economics in South Africa**

**Prof WF Krugell**



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# Putting the economy in its place: Geographical economics in South Africa<sup>1</sup>

*Waldo Krugell*

## 1. Introduction

The relationship between globalization<sup>2</sup> and economic development, is a topical and controversial one. Many economists see the benefits of globalization outweighing its disadvantages, and ascribe the rise in living standards, especially in Asia to the openness of trade brought on by globalization. Dissenting voices however, point to globalization as a contributing force to global inequalities and for locking poor countries into disadvantageous positions relative to richer countries (see for instance the summary in Wade, 2004). Following the financial crisis of 2008, many are arguing that financial integration and openness had gone too far, and that it is the interest of developing countries to delay or roll back financial openness (e.g. Obstfeld, 2008).

What is clear from these various positions in the literature is that globalization can be a double-edged sword. It can bring benefits in terms of development, but it can also expose weakness of an economy and it could contribute to increased inequality. Perhaps nowhere else is this more pertinent than in the case of local economic development. On the one hand globalization can bring huge benefits to localities by providing it access to a global market for its goods and services and by providing it access to foreign capital to exploit the location's advantages<sup>3</sup>. But on the other hand, openness to global markets can threaten local economic activity that previously thrived in a closed environment, with this threat being particularly real due to the high mobility of production factors within a particular country. The possible outcome is therefore greater within-country inequality. Even as country-level economic growth and productivity increases, some localities will thrive and others decline.

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<sup>1</sup> This address is a revised version of a paper co-authored with my colleagues Prof Wim Naudé at the Maastricht School of Management and Dr Marianne Matthee of the School of Economics at North-West University's Potchefstroom campus. I am grateful for their work on the broader geographic economics project and their inputs in this paper. All errors and omissions remain my own.

<sup>2</sup> Globalisation may be understood for purposes of this paper, following Epifani (2001:4) as the 'increasing international division of labour through the exchange of a greater variety of intermediate goods'.

<sup>3</sup> As remarked by Helmsing (2001:3) '...getting a small share of a large volume of internationally mobile investment may make a big contribution to local employment and income...and may assist in bridging the local-global gap'.

The questions are whether this tension between national efficiency and growth and sub-national inequality and equity is an inevitable outcome of globalization, and whether and how national and sub-national policies towards local economic development should attempt to address these. Certainly much of the existing empirical literature tends to find increased spatial inequality as countries' global economic integration and trade openness increases. The World Bank (2009:xxi) perhaps summarizes the current mainstream thinking on these tensions the best by stating that

'...economic growth will be unbalanced. To try to spread out economic activity is to discourage it. But development can still be inclusive, in that even people who start their lives far away from economic opportunity can benefit from the growing concentration of wealth in a few places. The way to get both the benefits of uneven growth and inclusive development is through economic integration'.

The World Bank (2009) argues that economic integration entails policies and interventions to deal simultaneously with urbanization, territorial (regional) development and regional integration, pointing out that the optimal mix of such policies and interventions will differ amongst countries depending *inter alia* on their stage of development and geography.

A requirement for identifying such a mix of policies and interventions in a particular country is that its policy makers should be able to grasp how its growth relates (and depends on) the spatial distribution of economic activity, and how the latter is shaped by policies, institutions and geography. In short, successful local economic development requires of policy makers to be able to identify lagging sub-national regions and the factors driving their divergence or convergence.

In this paper we apply this thinking to the case of South Africa<sup>4</sup>. We analyze the country's profile of sub-national inequality, and estimate the degree of convergence or divergence that has taken place in per capita incomes since the country's re-integration into the world economy following the transition to democracy in 1994. We take care to consider both institutional and geographical determinants of local economic growth, and to consider policies and interventions to increase economic integration in manner which may promote both (uneven) growth and inclusive development.

Following the World Bank's (2009) distinction between economic integration policies in the urbanization, territorial development and regional economic dimensions, we attempt to identify the key features of the challenge of local economic development in South Africa from each of these three perspectives.

As such this paper is a case study of the experience and options of local economic development in a Sub-Saharan African (SSA) country following its embrace of globalization. Given the current lack of such studies from SSA, it attempts to fill a vacuum by adding to the growing number of studies in the literature, which has dealt

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<sup>4</sup> This paper is based on, and summarizes, the empirical results of a number of previous papers by the authors, in particular Naudé and Krugell (2003;2006), Bosker and Krugell (2008), Krugell and Matthee (2009), Krugell and Rankin (2009) and Blaauw and Krugell (2010).

with spatial and regional inequalities in other developing and transition countries such as Brazil, China, Russia, amongst others.

In section 2 we first motivate why South Africa is an interesting case to study in this regard. In particular, we mention the country's efforts at global integration such 1994, and describe its patterns and deep causes of spatial disparity. The remainder of the paper aims at broadening our understanding of the dynamics of these spatial disparities from the territorial development, urbanization and labour market and firm-level perspectives. These perspectives are respectively taken in section 3, 4 and 5. Section 6 concludes.

## **2. Globalization and spatial inequality in South Africa**

### **2.1 From isolation to globalization**

1994 was a watershed year for South Africa. It was the year in which the first democratic elections took place after the ending of apartheid. It was also the year marking the end of the country's international isolation, and is the year in which the new government committed itself to steering the country towards integration with the global community. The country's commitment to globalization is clear in its extensive trade liberalisation, fiscal conservatism (the country recently had a budget surplus), its Constitutionally independent Central Bank committed to inflation targeting, substantial deregulation of the telecommunications and information technology (IT) sectors and the conclusion of a number of free trade agreements (see also Coetzee, *et al.*, 1997 and Naudé and Coetzee, 2004).

As documented by Naudé and Gries (2009), one outcome of South Africa's transition from isolation to globalization has been an increased openness of the economy, with the country increasingly benefiting from this to expand its exports. Between 1994 and 2010 South Africa's total exports increased on average by 15 per cent per annum. Real merchandise exports as a percentage of GDP increased from 16 per cent in 1994 to 22 per cent in 2008, before falling back to 17.9 per cent in 2010.

Economic growth also accelerated, and although the country did not achieve the targeted growth rates which the government aimed at in its economic growth and development strategies (first the 'GEAR' and then the 'ASGISA') growth picked up after 1994. With the exception of 1998, the year of the Asian Crisis, growth remained positive at historically high rates until the fourth quarter of 2008 (when the economy contracted in the aftermath of the US financial crisis).

Du Plessis and Smit (2007) confirm that since 1994 total factor productivity increased, which they argue was due to the increased openness of the economy.

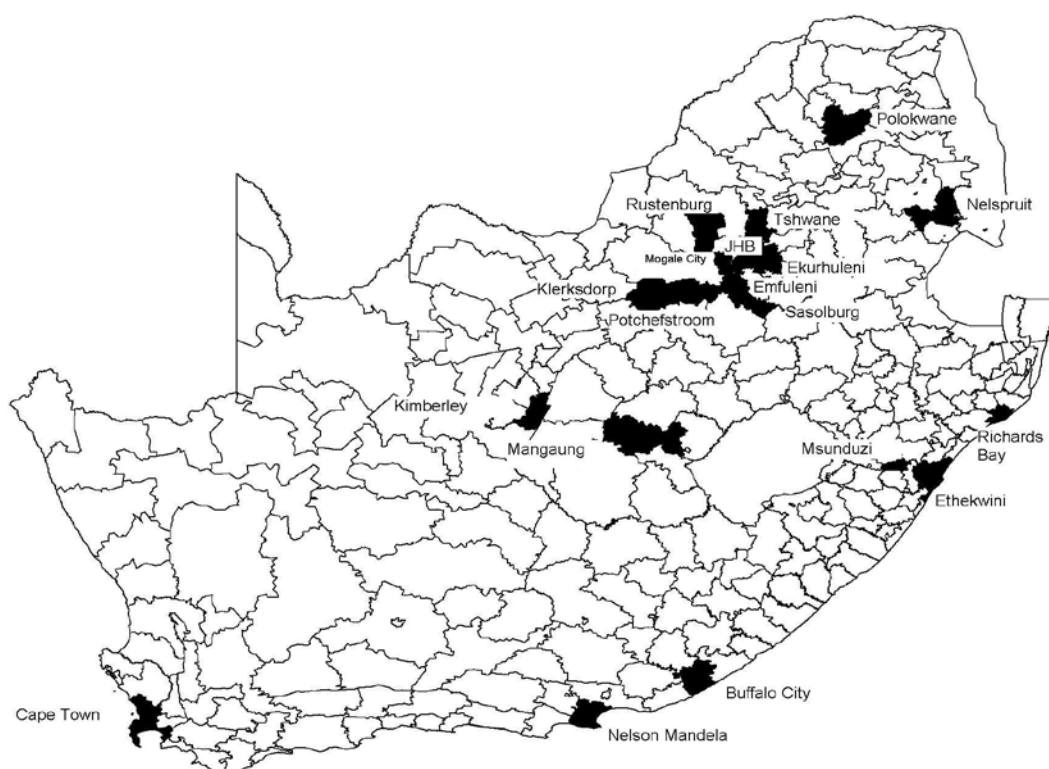
## 2.2 From spatial inequality to spatial inequality

Our interest in this paper is on how local economic growth in South Africa unfolded over this period of globalization. As greater openness, more opportunities for exporting and greater international trade are the key features of this period, one of our key concerns is about the ability of different localities to have benefitted from such opportunities. Before exploring this though, it is necessary to paint a picture of the drivers of local economic growth and spatial inequality before 1994.

The deep determinants of spatial economic development in South Africa is its first-nature geography, that is to say its basic geographic features which includes its long coastline along both the Atlantic and Indian Oceans, its harbors, climatic conditions which favors the eastern seaboard, and the location of precious metals and minerals.

Figure 1 shows the outline of South Africa and its 354 magisterial districts (which is the unit of analysis in much of this paper – see section 3 below for a description of these districts and the sources of data) and indicates the major urban agglomerations.

**Figure 1. Basic outline of South Africa and urban agglomerations**



*(Source: Compiled for the author by Giscoe (Pty) Ltd)*

Until the mid 1700s economic activity in South Africa was heavily concentrated along the coast, and in particular in three coastal cities: Cape Town, Port Elizabeth (now part of the Nelson Mandela Metropole) and Durban (now part of the Ethekwini Metropole). The major inland agglomeration by 1800 was the town of Kimberley, a world diamond producing location.

By the mid 1800s, the inland agglomeration of economic activity had shifted northward to the Johannesburg (JHB) area due to the discovery of gold. For much of the 20<sup>th</sup> century, South Africa's economy and the spatial distribution of economic activity was dominated by the exploitation of gold, and for much of the century the fastest growing localities in the country were around the inland agglomeration of Johannesburg and the administrative capital, Pretoria (now part of the City of Tshwane Metro). The infrastructure needs of the gold mining industry (in particular its need for electricity, equipment and transport infrastructure) provided a stimulus to the development of manufacturing around the gold mining industry. Even today the manufacturing sector in South Africa is largely based around the Johannesburg-Pretoria agglomeration, and is dominated by the metals and equipment sectors.

The formal introduction of apartheid policies in the 1950s reinforced the above spatial patterns of development, but in a manner which enforced inequalities along racial lines. Thus the 'grand apartheid' policy to create homelands for the country's majority African population enforced the spatial inequalities between the metropolitan and rural areas by attempting to confine the African population for political purposes to homelands. These were located in lagging rural areas, often areas with weak agricultural potential. And within towns and cities outside of the homelands, the 'Group Areas Act' was legislated to allow for the spatial separation of cities on racial grounds.

Understanding spatial inequality and local economic growth in South Africa, and promoting inclusive growth through integration within cities, territorial development and regional linkages as discussed in the introduction requires therefore an understanding of this apartheid legacy. In effect it added a further layer of inequality on top of the spatial inequality due to the country's first-nature geography. The racially motivated inequalities worsened spatial inequalities and territorial development, in particular local economic development, as it resulted in a spatial economy characterised by inefficient land use, excessive transport costs, and under-investment in transport infrastructure, telecommunications and electric power. It also resulted in segmented labour and consumption markets and created artificial internal barriers to trade (Naudé and Krugell, 2003b).

Today, South Africa is characterized by important spatial inequalities. In 2010 the top 15 out of 245 places produced approximately 70 per cent of output, 30 regions produced approximately 80 per cent of the country's output.

On the face of it, the country's globalization may not have improved spatial inequalities. Indeed, it would appear that local economic growth between different localities has been quite uneven over the past decade. Thus over the period 1996 to 2010 only 67 regions grew at rates faster than 3 per cent per annum. Of those, only 14 areas recorded growth in per capita GDP in excess of 5 per cent per annum. At the same time, 37 regions grew by less than one per cent per annum and in 13 regions GDP per capita fell.

The group of fast growers included Johannesburg, Kempton Park, Boksburg, Randburg, Pretoria and Durban. Sasolburg and Rustenburg were also fast growers along with smaller places such as Montagu, Mosselbaai, Wellington and George. The high-growth cities and towns are a mix of large, urbanised centres with a literate population and



large share of exports in the economy, as well as smaller towns. Johannesburg, Pretoria and Durban are examples of large cities that have grown fast over the period. There, the population is more urbanised and educated and exports make up a substantial share of economic activity (Krugell, Koekemoer and Allison, 2005:3).

There are also smaller places like Mossel Bay, Wellington and Montagu that fall in this league. Rustenburg and Phalaborwa were also fast growers with significant export shares, but are less urbanized, with resource extraction making up a significant part of the economy. Smaller places like Waterberg, Potgietersrus, Laingsburg, Humansdorp, Knysna, Witrivier, Nigel, Postmasburg, Riversdal and Warmbad also managed high average growth rates (Krugell, Koekemoer and Allison, 2005:3).

As documented by Krugell, Koekemoer and Allison (2005:4 ) amongst the slow growers the worst performing places were Welkom, Virginia, Westonaria, Klerksdorp, Wodehouse, Kuilsrivier, Mitchellsplain, Hlabisa and Mtunzini. These include areas dependent on gold mining that have contracted significantly such as Welkom, Klerksdorp and Westonaria. There are also localities close to the major metropolitan centres that have grown poorly, for example, Mitchells Plain and Kuilsrivier near Cape Town. The greater share of the towns and cities are however on average small, more rural than urban, with low levels of human capital and insignificant export shares.

It would thus appear that not all localities were able to benefit equally from the openness and growth that the economy experienced since 1994. These statistics suggests that the challenge of local economic development remain significant. Local governments (municipalities) in particular, are grappling with the challenges of economic development, for which they are constitutionally responsible. Indeed, as described by Naudé (2004) and Jansen van Rensburg and Naudé (2007), following its new Constitution the country embarked on an extensive restructuring of the system of local government, and the concept 'developmental local government' was introduced as a guiding principle. A key concern for local governments remain how they can benefit from the country's greater openness, and how they can contribute to creating conditions which will facilitate inclusive growth, even if that growth is spatially unbalanced. This requires an understanding of the determinants of convergence in per capita incomes across different localities. We explore these determinants in the next section.

### **3. Territorial development: Gaps and determinants**

Despite more than a decade of good growth and rising exports, the basic patterns of spatial inequality in South Africa remain. Only a proportion of localities achieved significant economic growth rates. In this section we investigate the determinants of local economic growth rates. We draw on Naudé and Krugell (2003b;2006) and Bosker and Krugell (2008). Although the focus is on economic growth and per capita income we recognize that economic growth is but one measure of territorial development. Other aspects, such as quality of life and vulnerability on a local level in South Africa is dealt with elsewhere, for instance in Rossouw and Naudé (2008), Naudé, McGillivray and Rossouw (2009) and Naudé, Rossouw and Krugell (2009).

### **3.1 Data and locations**

Adequate and reliable data for sub-national economic analysis remain elusive in all but the most advanced countries. In developing countries, such data is very hard to come by, and for African countries in particular, almost non-existent. South Africa is therefore a valuable exception in that consistent socio-economic data is available on a sub-national level at least from 1996 to the present (The analysis discussed here relied on data which mainly covers the period 1996 to 2004). However, as can be expected, this data is subject to severe shortcomings, which must be acknowledged upfront before discussing the results from studies based on this data.

The basic data that are used by most of the papers which we will draw on in the remainder of this paper comes from a system of integrated databases known as the Regional Economic Explorer (REX). The REX database is compiled by Global Insight Southern Africa and draws together many different sources of sub-national economic information from Statistics South Africa (such as census, household and labour force surveys), government departments, development agencies and Regional Services Councils. A discussion of the database and its construction is contained in Cameron (2005). The main weakness of the REX data is that in the process of reconciling data from many different sources across the spatial dimension, it is inevitable to make assumptions and imputations. The dataset is therefore far from perfect primary data, but nevertheless a unique resource in a developing country context.

The data from the REX is available for the level of magisterial district, of which there were 354 in South Africa until December 2000. Figure 1 depicted the demarcation of the country into 354 magisterial districts. After December 2000 the magisterial districts' functions were amalgamated into 284 local municipalities (see Naudé, 2001;2003 and Jansen van Rensburg and Naudé, 2007). However, REX continues to report data corresponding to the prior demarcation, for various reasons, most importantly that the previous demarcation is what was used in both the 1996 and 2001 censuses in South Africa. It may also be argued that the demarcation into 354 districts give a finer level of spatial disaggregation to the levels of cities and towns, which is useful when issues of spatial inequality is to be studied.

### **3.2 Spatial divergence in South Africa: Are the gaps growing?**

What is the extent of spatial inequalities and its changes over time as implied from this data? There are various methods to measure whether per capita income between places are converging or diverging, which each corresponding to a slightly different concept of convergence. These methods have been developed in the economic growth literature which was, following the seminal contribution by Solow (1956), interested in determining the speed of possible convergence in per capita incomes between lagging and leading countries in terms of per capita income.

We used four of the most widely used methods to test for (i) beta convergence (ii) sigma convergence, and to do (iii) Markov chain and (iv) kernel density analyses. We will briefly described these techniques and their results in the following sub-sections.

### **3.2.1 Beta-convergence**

Beta convergence is also known as ‘conditional convergence’, and it is tested for by regressing growth rates in per capita income ( $y$ ) on initial levels of per capita income and a set of control variables ( $X$ ), as in equation (1) below (see for example Barro and Sala-i-Martin, 1991; Mankiw, Romer and Weil, 1992).

$$\Delta y_{it} = x_{it} - \beta y_{it} + \varepsilon_{it} \quad (1)$$

Traditionally the coefficient on initial levels of per capita income is denoted by a ‘beta’ ( $\beta$ ); if regression estimates can establish that ‘beta’ is significant and negative ( $\beta < 0$ ) it would imply that there is beta-convergence. Beta-convergence means that per capita incomes would converge amongst regions in the sample conditional on the control variables. The size of the beta coefficient gives an indication of the speed of convergence. The early cross-country growth literature found rates of convergence at around 2 per cent per year. Temple (1999: 134), however, notes that later estimates have varied between zero and 30 per cent a year, and that the consensus that is emerging is one of uncertainty.

Naudé and Krugell (2003b) and Naudé and Krugell (2006) tested for beta convergence amongst South African magisterial districts. Our main finding was that there is indeed evidence of beta convergence in South Africa, but that it is slow. Convergence is conditional on education levels (i.e. human capital), initial public capital stock (which we argue could reflect local institutional strength), the share of exports (trade), and distance from Johannesburg (which proxies for access to markets and transport costs).

### **3.2.2 Sigma convergence**

‘Beta’-convergence indicates that poorer magisterial districts are converging on average to the richer ones. It says little about whether these magisterial districts have actually caught up or are falling behind others in terms of levels of per capita income. To determine this, one could evaluate the dispersion of income per capita across magisterial districts over time. A reduction in this dispersion is known as sigma-convergence ( $\sigma$ -convergence). Here the focus is on the evolution of the cross-sectional income distribution – its shape and the movement of the distribution over time (Barro & Sala-i-Martin, 1992:383). All other things being equal, ‘beta’-convergence may eventually lead to sigma-convergence.

Naudé and Krugell (2006) investigated  $\sigma$ -convergence in the case of South Africa’s magisterial districts by calculating the coefficient of variation of income per capita, or the standard deviation of the log of income per capita, across the magisterial districts over the period 1998 to 2002. They found that the standard deviation of the log of income per capita decreased somewhat between 1998 and 1999, but then increased again. We extended these calculations by calculating the changes in the standard deviation of per capita income and population across cities and towns between 1990 and 2000 (using data from the PIMSS). These results, for the years 1990, 1996 and 2000 for which data on 354 magisterial districts in South Africa is available, are shown in Table 1.

**Table 1: Sigma convergence in South Africa 1990 – 2000**

Year	Standard Deviation of Log of Real per capita Income: <i>All districts</i>	Standard Deviation of Log of Real per capita Income: <i>Richest 20% districts</i>	Standard Deviation of Log of Real per capita Income: <i>Poorest 20% of districts</i>	Standard Deviation of Log of Real GGP for <i>All districts</i>
1990	0.6147	0.3229	0.2379	1.52
1996	0.5258	0.2944	0.1063	1.51
2000	0.5466	0.3153	0.1082	1.55

(Source: Naudé and Krugell, 2003)

From Table 1 can be seen that there may be evidence of sigma convergence amongst South African cities and towns. The standard deviation of log of real per capita income for all cities and towns declined from 0.6147 in 1990 to 0.5258 in 1996, after which it increased again slightly to 0.5466 in 2000. This amounts to an almost 13 per cent decline in the standard deviation over a 10-year period. The slight increases in divergence after 1996 coincide with the period of the country's globalization efforts. The results are consistent with the view that globalization would favor the larger urban areas where economies of scale and agglomeration advantages can be more readily obtained. The Bartlett test shows these changes to be significant at the 5 percent level. The results in table 1 also show that the convergence was much stronger amongst the 20 per cent poorest magisterial districts between 1990 and 2000 (a 50 per cent decrease in dispersion of per capita incomes) whilst there is not really strong evidence of sigma convergence amongst the richest 20 per cent of cities and towns. This could suggest an overall reduction in the dispersion of per capita incomes over the longer term.

### **3.2.3 Kernel density analysis<sup>5</sup>**

The studies into the dynamics of spatial disparities in South Africa using conditional and sigma convergence cited above could thus find no hard evidence that the smaller, poorer places in South Africa have been growing faster than the larger, better-off places. At best, regression results indicate slow beta-convergence conditional on the initial capital stock in the magisterial district, human capital, the openness of the economy and the magisterial district's distance from Johannesburg.

The growth regression results do not, however, provide information about the shape of the distribution of income across localities, or how it has evolved over the years. To analyse the shape of the distribution of income across localities and its evolution, requires a distribution dynamics approach as proposed by Quah (1996). This involves estimating kernels of magisterial district incomes in different time periods so that their shapes and intertemporal dynamics can be studied.

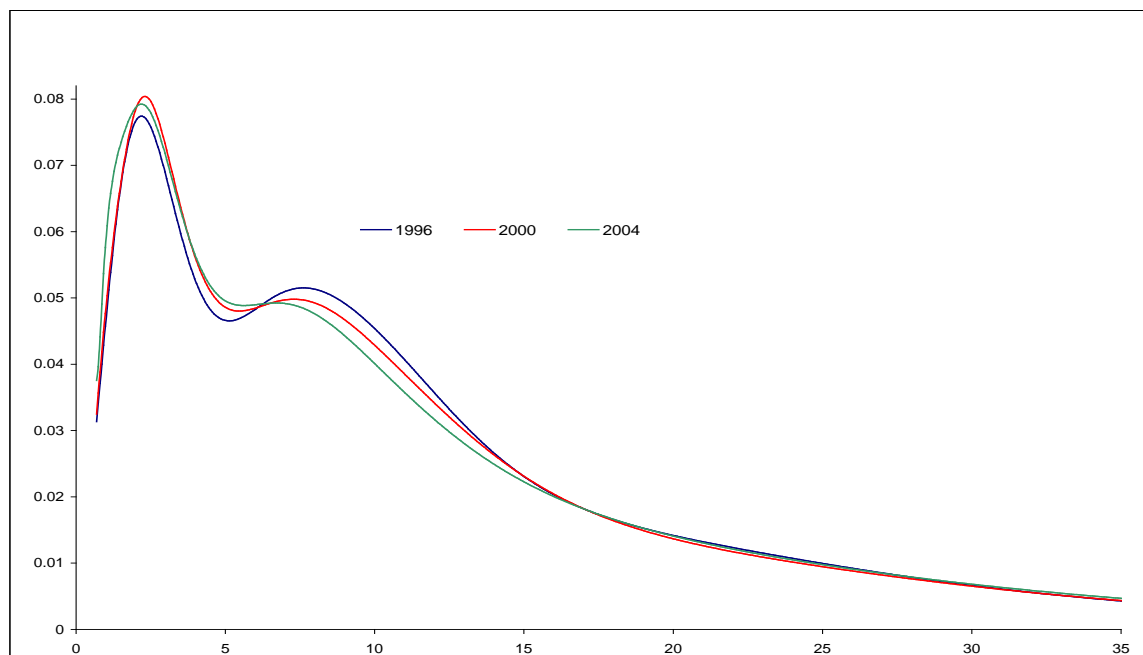
A kernel estimator of a set of observations is an estimated distribution function from which the observations are likely to have been drawn. In this case the observations will be per capita GDP at magisterial district level. The interpretation of the kernel estimators is that they provide information about the mass of the distribution of per

<sup>5</sup> This section draws on Krugell, Koekemoer and Allison (2005).

capita GDP. Based on the growth experience of the magisterial districts, they show how likely it is that per capita GDP was below a certain level in a particular year (Aziz and Duenwald, 2001).

Figure 2 below is taken from Krugell, Koekemoer and Allison (2005). Figure 2 depicts the kernels of the magisterial district incomes in 1996, 2000 and 2004. It shows for 1996 an almost twin-peaked distribution with a higher density of magisterial districts with per capita GDP between R5,200 and R9,800 per annum. The 2000 and 2004 distributions indicate that that mass subsequently diminished. The figure shows that the 2004 distribution lies further to the left with more places having lower per capita GDP. Krugell, Koekemoer and Allison (2005) calculated, based on this data, that in 1996, 50 per cent of the mass of the income distributions was below R9,500 per capita. In other words, the unconditional probability that a magisterial district's per capita GDP was less than R9,500 per annum, was approximately 50 per cent. In 2004 this probability increased slightly to 51 per cent, imply no evidence of convergence. As such these results are consistent with the beta-and sigma-convergence results reported in the previous sections.

**Figure 2: Density of per capita GDP (1996, 2000, 2004)**



(Source: Krugell, Koekemoer and Allison, 2005:7).

### **3.2.4 Markov chain analysis**

Markov chain analysis complements the previous analyses by analyzing the dynamics of the spatial income distribution in terms of its intra-distributional dynamics. This allows

a description of the evolution of spatial incomes over a particular period (see e.g. Quah, 1993a, 1993b, 1996a, 1996b).

Bosker and Krugell (2008) applied Markov chain analysis to South Africa's magisterial districts. They assigned each district to one of a pre-specified number of groups based on its relative GDP per capita level. Using the symbol  $f_t$  to denote the vector of the resulting discretized distribution at period  $t$  and making the assumption that the distribution follows a homogenous, stationary, first order Markov chain process, they depict the evolution of the income distribution as follows:

$$f_{t+x} = M f_t \quad (3)$$

Where  $M$  is the so-called  $x$ -period transition matrix that maps the distribution at time  $t$  into period  $t+x$ . Each element of the *transition matrix*,  $m_{ij}$ , denotes the probability of a region having a GDP per capita that leads it to be located in income group  $i$  of the discretized distribution at period  $t$ , to make the move to income group  $j$  in period  $t+x$ .

From the transition matrix it is possible to calculate whether there is a tendency for convergence or divergence in per capita incomes amongst South African magisterial districts. The estimated transition probability matrix allows one to calculate a steady state income. This so-called ergodic distribution can be calculated by noting that the following has to hold in a steady state: if  $f_\infty$  is the steady state distribution it has to hold that multiplying this distribution by the transition matrix,  $M$ , gives  $f_\infty$  back, i.e.:

$$Mf_\infty = f_\infty \quad (4)$$

Rewriting this as  $(I - M)f_\infty = 0$ , shows immediately that  $f_\infty$  is the eigenvector of the transition matrix  $M$  associated with the eigenvalue of 1. A caveat to note is that the income distribution will only converge if the second largest eigenvalue of the estimated transition matrix is smaller than one. In the South Africa case Bosker and Krugell (2008) found that the second largest eigenvalue of  $M$  equals 0.988 and thus the income distribution will converge to a steady-state and can be calculated.

When this steady state distribution was calculated Bosker and Krugell (2008) found that if the income distribution continues to evolve as it did between 1996 and 2004, this will result in an income distribution where 98 per cent of the regions earn less than 0.36 times the national level of GDP per capita and only 2 per cent of the regions more than that, suggesting a heavily diverging income distribution.

The upshot of this finding is that if the spatial (or 'territorial') income dynamics remain as they have been over the last number of years, South Africa is likely to experience heavily diverging income levels in many of its localities, resulting in a (continued) highly unequal distribution of income across the country.

From the estimated transition probabilities Bosker and Krugell (2008) also calculated several interesting mobility indices. These include indices describing the degree of mobility in the process of moving towards the steady state and indices describing the

degree of mobility once the steady state is reached. They established that the indices describing the mobility towards the steady state indicate that while the movement towards the steady state takes quite some time (a half-life of 58 years) the degree of mobility of regions within the distribution is quite low. This suggests that there is some time for policymakers to turn the tide, but the problems facing the poorest regions could be quite substantial to overcome. They furthermore found that the indices describing the mobility in the steady state corroborate the finding of low intra-distributional mobility. In particular these suggest that there is only a 1 per cent chance that a particular district will shift to a different income group once the steady state is reached. Also in the steady state, the magisterial districts that are relatively rich (poor) remain rich (poor) indicating that the high degree of regional per capita income inequality is likely to remain with very few districts being able to reverse their fortune.

## **4. Cities and spatial inequalities**

### **4.1 Why cities are important to unlock inclusive growth in South Africa**

The studies surveyed in section 3 consistently found no evidence of absolute convergence across South Africa's territorial space between per capita incomes of magisterial districts. Indeed, the persistence and even widening of income gaps was predicted from Markov Chain analysis. One of the crucial mechanisms in this divergence is the role played by cities or urban agglomerations. Cities are widely seen as enhancing growth through higher productivity and attainment of better living standards – although the costs of cities in terms of congestion, squalor and environmental degradation have also been noted.

### **4.2 Profile of and challenges facing South African cities**

There are a number of reasons why cities may be important for economic development in South Africa. For one, Naudé and Krugell (2003b) found that cities were growing faster on average than smaller places, and that proximity to South Africa's largest urban agglomeration (Johannesburg) was positively associated with higher local economic growth rates. They also found an enhanced role for human capital to play in cities, which echoes the argument of Glaeser (1997) that a city's density speeds up the rate of interaction between people, with the result that people learn through their interactions and human capital accumulation is faster (Glaeser, 1997).

There were 19 cities or large urban areas in the country that produced over 70 per cent of South Africa's Gross Domestic Product (GDP) in 2011. Naudé and Krugell (2003b) found that these cities are the country's 'engines of growth'. Indeed, urbanization is associated in South Africa, as in most of the rest of the world, with increases in per capita incomes and declines in fertility rates (see e.g. Henderson 2000). In South Africa for instance the total average annual income in rural areas in 2000 was R 18,506 compared to R 51,107 urban areas. Given that South Africa is indeed experiencing high

and rapid urbanization<sup>6</sup>, the challenge facing policy makers and city planners is to manage urbanization in such a way that it continues to provide these developmental benefits.

This poses a challenge for the South African government. Although cities are expected to contribute towards inclusive development, the country's cities are characterized by uneven development, inefficient industries and declining quality of life in many instances. These constraints may in effect limit the extent to which the country can benefit from globalization as it would hamper cities' international competitiveness.

Under apartheid the functioning of South Africa's cities were distorted through restrictions on the mobility of labour, on the use of capital, through different administrative and legal systems in different parts of the country, through wage and capital subsidies according to location, and through distortions of transport costs. These have resulted in higher living costs for the urban poor, particularly in terms of time and travel distances to work. Because of this, the urban poor remain particularly vulnerable to the potential destructive impact of globalization, such as the shocks of trade liberalization and the shedding of 'old economy' jobs.

Even though recent estimates are difficult to come by, the 1996 Census already indicated that over 2.1 million urban residents in South Africa are estimated to be poor, i.e. earning less than the then poverty line of R 1,500 per month. Given high rates of urbanization this number is likely to be much higher at present. Urban poverty may also be exacerbated by backlogs in housing provision (see Pillay and Naudé, 2006) and the provision of basic services (see also Krugell, Otto & Van der Merwe, 2010). Furthermore, migration to South African cities seems to be no longer opportunity driven (or driven by the need for economies of scale), but survival driven, contributing to large unemployment in urban areas and greater dependency in rural areas (Schlemmer and Lovell, 2000:3). Whilst urban areas and cities in particular, provide the most substantial tax base, city governments are under increasing financial pressure (Jansen van Rensburg and Naudé, 2008).

The ability of South Africa's cities to meet these challenges may depend on the extent to which these cities succeed in generating economic growth through providing static and dynamic economies of scale (urbanisation and localisation economies). These are traditionally the justification for the existence of cities, and for encouraging urbanisation. Localisation economies refer to the benefits a firm receives from being with other firms in the same industry and is said to give rise to internal economies of scale. Urbanisation economies refer to the benefits of overall scale and diversity and is said to give rise to external economies of scale (Henderson *et al.*, 1995:1068). Apart from these static externalities there are also two types of dynamic externalities, namely Jacobs externalities and so-called Marshall-Arrow-Romer (MAR) externalities, the latter due to knowledge sharing, learning and imitation in a particular area (Glaeser *et al.*, 1992). In the endogenous growth literature, cities are important for economic growth

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<sup>6</sup> Southern Africa has one of the world's highest rates of urbanisation (United Nations World Urbanization Prospects, 2001). Urbanisation in South Africa is expected to reach 70 per cent by 2030 (subject to the impact of HIV/AIDS).



precisely because they provide these dynamic information externalities that are important for innovation (as per Romer, 1986 and Lucas, 1988).

Two major issues which have an impact on urbanisation and localisation economies in South Africa are the sizes of its cities (given their production mix) and the functioning of their labour markets. In the latter regard, the re-integration of South African cities following the abolition of apartheid may be a prerequisite for enabling cities to become competitive, job-creating platforms for the country to achieve inclusive growth in a global context. Sections 4.3, 4.4 and 4.5 report briefly on what our research have found in this regard.

### **4.3 Size and Functions of South African Cities**

Naudé and Krugell (2003a) investigated the question of whether South African cities are yet of optimal size, and Naudé and Krugell (2005) studied the specialization and diversification of its cities. This section draws on these two studies to argue that there may be scope for growth in South African cities, but that not all cities may be equally able to create jobs or grow equally fast.

In many developing countries cities often tend to be over-sized (see e.g. Henderson, 2000). This may be due to the absence of large-scale land developers, a lack of strong land markets and contract enforcement, weak local fiscal autonomy and political institutions that encourage over-concentration (Ades and Glaeser, 1995; Henderson, 1988). However, *a priori*, South Africa might have entered its period of globalisation in 1994 with under-sized, rather than over-sized cities. This is because the country's cities have been shaped by decades of apartheid. Apartheid-planning created a spatial economy characterised by inefficient land use, excessive transport costs, under-investment in transport infrastructure, telecommunications and electricity; it also resulted in segmented labour and consumption markets, and created artificial internal barriers to trade. All of these might have contributed towards sub-optimal city sizes in South Africa.

Naudé and Krugell (2003a) argued that it might be important to confirm or reject the hypothesis that South Africa's cities are too small since the policy implications for generating efficient future economic growth is very different than would be the case if South Africa's cities were over-sized. Sub-optimal city size would suggest that the most efficient route to further long-term economic growth would be to encourage current cities to grow through urbanisation. On the other hand, if South African cities were already of optimal size, or over-sized, policy should assist new metropolitan areas to develop. The implications for city planning are thus very different under these two possibilities<sup>7</sup>.

Naudé and Krugell (2003a) showed that the country's cities tend overall to be "small", with six "large" cities and no "mega" city. The 40 largest cities in South Africa all have populations of 250,000 or more, but apart from Greater Johannesburg (including the 'Ekurhuleni' municipality – see the map in Fig. 1), less than 5 million. They show that

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<sup>7</sup> The following paragraphs are drawn from Naudé and Krugell (2003a).

about 80 per cent of South African localities have less than 250,000 inhabitants. Indeed the median<sup>8</sup> municipality in South Africa in 2001 (the year of the last census) had a population of 87,000 people.

To investigate whether there is scope for growth, Naudé and Krugell (2003a) calculated the rank-size distribution of cities for South Africa. The rank-size distribution of cities throughout the world follows a law that states that the number of cities with a population larger than  $S$  is approximately proportional to  $S^{-q}$  (Gabaix, 1999; Knudsen, 2001). In other words, rank times population size is approximately the same constant for all cities. If  $q$  is equal to or close to 1 it is also known as “Zipf’s Law” (Zipf, 1949).

Naudé and Krugell (2003a) estimated  $q$ , and found this to be  $q = 0.75$  in the South African case. Fujita *et al.* (1999:216) report a coefficient of 1.004 for 130 large USA cities. Thus, whilst the rank-size rule applies to South Africa (it explains 98 percent of the variance in city sizes) Zipf’s Law *does not* hold for South Africa. What are the implications of  $q = 0.75$  for evaluating the sizes of South Africa’s cities?

According to Brakman, Garretsen and Van Marrewijk (2001) if  $q < 1$ , then a more even distribution of city sizes results than if Zipf’s Law holds, and in the limiting case where  $q = 0$  all cities would be of the same size. From this we may conclude that South Africa’s cities sizes tend to be more evenly spread.

Gabaix (1999) shows that Zipf’s Law would hold if cities were characterized by either constant returns to scale or by external economies of scale where positive and negative externalities cancel out. This could be interpreted where the agglomeration forces and congestion (dispersion) forces cancel out (see also Brakman Garretsen and Van Marrewijk, 2001). Brakman, Garretsen, van Marrewijk and van den Berg (1999) support this notion and calculate  $q$  for the Netherlands for the periods 1600, 1900 and 1990, and note that “industrialization lead to an increase in  $q$ ”. By 1600 the value for  $q$  was much lower than 1 (0.55) and it subsequently rose as city sizes increased.

The implications is thus that South Africa’s cities are too small and that these cities are still predominantly offering *urbanisation economies* rather than localisation economies (see also Henderson *et al.*, 1995).

This however, would be a broad generalisation about the roles of South African cities. There might be important differences between the extent to which different cities in South Africa offer largely urbanisation or localisation economies. There is clearly a need for further research in this area. The different cities in South Africa all play an almost unique role in the national economy. Both specialised as well as diversified cities are needed. Specialization is important, since it is a pervasive source of agglomeration and scale economies. Diversified cities are seen as the ‘nurseries’ for new firms and products. This is important for strategies to grow the urban economy, as it indicates that small business support, deregulation of the informal sector, and skills-development support for the self-employed, should especially target the larger, diversified urban

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<sup>8</sup> The average municipal size in 2001 was 178,365 and is twice the size of the median due to the 6 “outlier” cities with more than 1 million people each.

economies of South Africa. The following two sub-sections report on more recent work at such a micro-local level: on the importance of the thickness of the labour market for day labourers and on the existence of agglomeration economies at firm level.

#### **4.4 Labour markets in South African cities**

Explanations of labour market outcomes in South Africa have focused on the attributes of individuals, specifically the importance of education, as well as on labour market characteristics and social networks. A few authors have also considered the spatial aspects of the labour market and recently Havemann and Kearney (2010) found that urbanisation is an important predictor of wage differentials in the formal sector. Blaauw and Krugell (2010) expanded this line of work by arguing in favour of the Smith-Marshallian view of agglomeration and the labour market. This approach holds that the size and proximity of economic activity found in cities and large towns ensure a thick labour market that allows for better matching between workers and jobs. Two models characterise this approach. Helsley and Strange (1990) showed that a large city allows for a better average match between heterogeneous workers and employers' job requirements and this enhances efficiency. On the other hand, Duranton (1998) argued that a large market allows workers to become more specialised and, therefore, to be more efficient. In both cases, greater efficiency increases workers' wages and this attracts more workers.

Our focus was on day labourers, drawing on a country-wide survey. There are nearly 1,000 places in South Africa where a minimum of 45,000 mostly black African men stand and wait to be picked up for day labour (Blaauw, 2010). The survey data allowed us to estimate a regression model of the importance of the thickness of the labour market as a predictor of day labour wages, while controlling for individual-specific characteristics. A key argument of this paper was about *where* the day labourers are. It was argued that large urban areas do allow for a better match between workers and jobs, and this allows day labourers to become more specialised. The data that are available precludes the estimation of spatial wage equations [see for example Garretsen et al.'s (2003) Helpman-Hanson model], but there are a number of ways to test whether location matters. At the most basic level it is possible to add basic controls for location. Model 1 in table 2 below includes measures of the thickness of the labour market. The metro dummy indicates whether the day labourer works in a metropolitan city or not. The location of the day labourers can be identified at district council level and thus population density can be included as a measure of agglomeration. The data are from Global insight's Regional Economic Explorer database. A measure of occupation density was also constructed. This measures the number of day labourers per type of work (skilled or unskilled) per district council, for each of the respondents. Greater occupation density means more people doing the type of work you are doing, where you are doing it. For all three of these variables the theory would predict a positive relationship with earnings in a good week.

**Table 2: Regression results: Location and earnings in a good week**

<b>Dependent variable: log of earnings in a good week</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Beta coefficients</b>
(Constant)	5.050 (.093)	4.968 (.093)	
Age dummy 21-25	.149 (.066)*	.138 (.065)*	.074
Age dummy 26-30	.206 (.066)*	.192 (.065)*	.109
Age dummy 31-35	.245 (.067)*	.224 (.066)*	.116
Age dummy 36-40	.209 (.069)*	.187 (.068)*	.085
Age dummy 41-45	.225 (.071)	.195 (.071)*	.076
Age dummy 46-50	.196 (.077)*	.166 (.076)*	.053
Age dummy 51-55	.261 (.087)*	.224 (.086)*	.051
Age dummy 56-60	.198 (.105)	.183 (.104)	.030
Age dummy over 60	.227 (.182)	.221 (.179)	.017
Edu: Completed secondary schooling	.151 (.051)*	.136 (.051)*	.064
Edu: Post-school qualification	.092 (.086)	.098 (.085)	.018
Years worked as a day labourer	.003 (.002)	.005 (.002)	.028
Frequency of hire dummy: Often	.379 (.042)*	.355 (.042)*	.166
Frequency of hire dummy: Sometimes	.198 (.039)*	.192 (.038)*	.109
Frequency of hire dummy: Seldom	-.336 (.036)*	-.351 (.036)*	-.234
Type work: Skilled cluster=1	.063 (.021)*	.071 (.044)*	.219
Variety of day labour jobs	.207 (.095)*	.335 (.142)*	.199
Ever held a full time job =1	.711 (.022)*	1.360 (.022)*	.047
Metro areas =1	.068 (.033)*	.745 (.125)*	.319
Population density	.000 (.000)	.000 (.000)	.031
Occupation density	4.556 (.618)*	4.758 (.066)*	.279
Metro areas * Type job		.028 (.066)	.008
Metro areas *Variety job		-.952 (.401)*	-.061
Metro areas * Occupation density		-8.814 (1.380)*	-.257
Type job * Occupation density		1.135 (.473)*	.053
Type job * Variety job		-1.071 (.187)*	-.168
Adjusted R-squared	.394	.410	

(Source: Blaauw and Krugell, 2010)

To test the claims that a thick labour market allows for better matching and specialisation, it is also possible to test some interactions. Model 2 includes a number of interactions: *metro\*typejob*, *metro\*varietyjob*, *metro\*occudensity*, *typejob\*occudensity* and *typejob\*varietyjob*. The reported standard errors are robust to heteroskedasticity and the variance inflation factors are all less than 10.

The results of model 1 show that the location variables add significantly to the explanatory power of the model. The metro dummy is positive and significantly related to earnings. Unfortunately the coefficient of the population density variable is practically zero, but greater occupation density is positively and significantly associated with earnings. Adding the interaction terms to model 2 produces more interesting results. The coefficients on the interaction terms can be interpreted as follows. The *metro\*typejob* interaction is positively related to earnings. This means that day labourers in metropolitan areas that do skilled jobs earn more. In metropolitan areas doing a greater variety of jobs is negatively associated with earnings. This may be support of Duranton's (1998) idea that a thick labour market may allow workers to become more specialised. However, in metropolitan areas greater occupation density is also negatively associated with earnings, which reflects the competition for jobs amongst day labourers in the big cities. Recent increases in the number of day labourers in South Africa's major cities will increase this level of competition even further. The interaction of *typejob* with *occudensity* indicates that for skilled workers (compared to unskilled workers), greater occupation density is positively related to earnings. However, skilled workers need to specialise. The interaction of *typejob* and *varietyjob* indicate that if skilled workers do a greater variety of jobs, it is negative related to earnings.

The final column in table 2 also reports standardised beta coefficients for model 2. These can be interpreted as the change in the log of earnings in a good week for a one standard deviation change in the particular independent variable. The benefit of standardised betas is that they allow for comparison of coefficients. This means that the largest positive relationships with earnings in a good week are with working in a metropolitan area, doing skilled work, being hired by the same employer more often and doing a greater variety of jobs. However, doing a greater variety of jobs is only better for unskilled workers as skilled workers are better off specialising. In this model, working in a metropolitan area and being hired by the same employer more often are more important than education. The largest negative relationship with earnings in a good week is with the competition from other workers in metropolitan areas.

These results by Blaauw and Krugell (2010) show that individuals' education and skills, as well as factors associated with a thicker labour market are positively associated with wages. This has important policy implications and calls for the development of both people and places.

#### **4.5 Firms and agglomeration**

Where firms cluster together, there are efficiency gains from outsourcing, labour pooling and knowledge spillovers. Our earlier research into agglomeration in South Africa focussed on sub-national regions and found that capital stock, human capital, access to

markets and exports are significant determinants of output growth. Later work by Krugell and Rankin (2010) examined whether location explains differences in efficiency at firm level. Data from the 2007 World Bank Enterprise Surveys allow one to examine firms in the four major South African cities.

**Table 3: Regression results for the 2007 dataset**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
Constant	2.342 (17.65)	2.350 (17.06)	2.315 (17.81)	2.422 (18.10)
Capital	0.034 (4.84)**	0.033 (4.81)**	0.029 (4.11)**	0.028 (4.07)**
Labour	0.025 (2.48)**	0.024 (2.23)**	0.027 (2.75)**	0.025 (2.52)**
Materials inputs	0.721 (52.1)**	0.721 (51.8)**	0.715 (52.65)**	0.717 (51.39)**
Indirect inputs	0.134 (8.61)**	0.134 (8.58)**	0.137 (5.44)**	0.141 (8.92)**
Exporter dummy		0.007 (0.22)		
Location dummy			0.137 (5.44)**	
Cape Town dummy				-0.153 (-4.41)**
Durban dummy				-0.116 (-3.06)**
PE dummy				-0.144 (-3.08)**
Industry: Food				0.015 (0.40)
Industry: Textiles				0.006 (0.06)
Industry: Garments				0.050 (1.30)
Industry: Chemicals				-0.058 (-1.37)
Industry: Plastics and rubber				0.020 (0.28)
Industry: Non-metallic mineral				0.051 (0.46)
Industry: Base metals				-0.241 (-1.11)
Industry: Fabricated metals				0.047 (1.19)
Industry: Machinery				-0.009 (-0.15)
Industry: Electronics				0.143 (1.92)*
Adjusted R <sup>2</sup>	0.91	0.91	0.92	0.92

\* Significant at the 10% level \*\* Significant at the 5% level

(Source: Krugell and Rankin, 2009)

Krugell and Rankin (2010) showed that there may be tentative firm-level evidence of agglomeration economies in the land-locked Gauteng province that contains Johannesburg, the East Rand and Pretoria. There is a positive relationship between firms located in Gauteng and output per worker and this holds when controlling for the size of the market and level of education in the different cities. This relationship is reversed when controlling for the measures of manufacturing specialisation. This

means that on average, output per worker is lower in the landlocked Gauteng economy than at the coast when you control for the relative manufacturing specialisation of the coastal cities, which in turn is negatively associated with output per worker. Table 3 above presents the results of the estimation of the models using the 2007 World Bank Enterprise Survey data. Model 1 shows a positive and significant relationship between output per worker and the firm-level determinants of output. The exporter dummy is again positive but insignificant. The landlockedness or location dummy in model 3 is positive and significant and the city-specific dummies show that firms that are located in the coastal economies have, on average, lower output per worker when controlling for the firm-specific determinants of output.

Table 4 presents the results of different specifications using the firm-level 2007 survey data as well as the 1996 location-specific measures of agglomeration. Model 5 shows that GDP per capita and the economically active population are still positive determinants of output per worker, but population density as an indicator of market size again has a negative coefficient and in this case is significant. The education measure in Model 6 is positively associated with output per worker, but not significant. The measures of manufacturing specialisation in Model 8 also show that manufacturing employment as a share of total employment in a city is negatively and significantly associated with output per worker and coefficient on the location quotient is positive. However, in this specification of the model, the landlocked-vs.-coastal dummy is positive but not significant. This means that on average, output per worker is higher in the landlocked Gauteng economy than at the coast when you control for the relative manufacturing specialisation of the coastal cities, which in turn is negatively associated with output per worker. Finally, Model 9 includes exports as a percentage of GDP and the results in Table 4 show a negative if insignificant relationship with output per worker. Of the sub-sector dummies, only Garments is significantly and positively associated with output per worker.

The 2007 analysis seems to corroborate the evidence of agglomeration economies in the landlocked Gauteng province. This evidence that agglomeration economies exist and that they explain output at firm level also confirms the earlier results found by Naudé and Krugell (2003, 2006), but say little about the possible sources of agglomeration at work at firm level. What follows is a more close-up view of possible indicators of sources of agglomeration from the firm-level surveys.

**Table 4: Regression results for the limited 2007 dataset with location-specific covariates**

	<b>Model 5</b>	<b>Model 6</b>	<b>Model 7</b>	<b>Model 8</b>	<b>Model 9</b>
Constant	2.170 (11.99)	0.691 (1.58)	2.132 (6.49)	3.355 (1.77)	2.276 (7.02)
Capital	0.030 (2.73)**	0.031 (2.77)**	0.030 (3.73)**	0.031 (2.77)**	0.030 (2.75)**
Labour	0.010 (0.60)	0.011 (0.65)	0.010 (0.61)	0.012 (0.65)	0.011 (0.64)
Materials inputs	0.749 (39.70)**	0.749 (39.09)**	0.750 (39.21)**	0.749 (39.09)	0.750 (39.38)
Indirect inputs	0.113 (5.33)**	0.111 (5.05)**	0.112 (5.13)**	0.111 (5.05)**	0.111 (5.05)**
Location dummy	0.174 (4.58)**	(dropped)	0.170 (3.68)**	0.041 (0.19)	0.211 (2.08)**
GDP per capita		0.048 (0.26)			
Economically active population		0.150 (3.40)**			
Population density		-0.144 (-2.51)**			
Education			0.021 (0.14)		
Manufacturing employment				-0.350 (-0.63)	
Tress index				(dropped)	
Location quotient				0.129 (0.81)	
Exports as % of GDP					-0.037 (-0.39)
Industry: Food	0.072 (1.37)	0.079 (1.48)	0.072 (1.37)	0.079 (1.48)	0.073 (1.40)
Industry: Textiles	0.152 (1.18)	0.163 (1.25)	0.154 (1.19)	0.163 (1.25)	0.158 (1.22)
Industry: Garments	0.149 (2.79)**	0.147 (2.75)**	0.149 (2.78)**	0.147 (2.75)**	0.148 (2.76)**
Industry: Chemicals	-0.040 (-0.65)	-0.038 (-0.61)	-0.040 (-0.65)	-0.038 (-0.61)	-0.039 (-0.64)
Industry: Plastics and rubber	0.150 (1.44)	0.148 (1.42)	0.149 (1.43)	0.148 (1.42)	0.148 (1.42)
Industry: Non-metallic mineral	0.317 (1.59)	0.319 (1.59)	0.318 (1.59)	0.319 (1.59)	0.319 (1.59)
Industry: Base metals	-0.057 (-0.20)	-0.053 (-0.19)	-0.057 (-0.20)	-0.053 (-0.19)	-0.056 (-0.20)
Industry: Fabricated metals	0.045 (0.87)	0.048 (0.90)	0.045 (0.86)	0.048 (0.90)	0.045 (0.85)
Industry: Machinery	0.067 (0.64)	0.055 (0.52)	0.066 (0.63)	0.055 (0.52)	0.064 (0.60)
Industry: Electronics	-0.057 (-0.48)	-0.059 (-0.49)	-0.058 (-0.49)	-0.059 (-0.49)	-0.059 (-0.50)
Adjusted R <sup>2</sup>	0.94	0.94	0.94	0.94	0.94

\* Significant at the 10% level \*\* Significant at the 5% level

(Source: Krugell and Rankin, 2009)

In Table 5 from Krugell and Rankin (2009) the indicators of the existence of agglomeration economies per city are grouped in terms of the possible sources of agglomeration, namely intermediate inputs, the labour market, infrastructure and access to knowledge. Table 5 shows that the 2007 Enterprise Survey asked firms about the use of inputs and whether they are manufacturers and sellers of intermediate inputs.



On average, firms in Johannesburg, the East Rand and Pretoria use more domestic inputs, fewer foreign inputs and they are significant sellers of intermediate inputs. One-way ANOVA indicates that the difference in sales of intermediates between the firms in the greater Gauteng and those in the coastal cities is significant. The diversity of intermediate inputs that characterises the agglomeration in Gauteng may also be reflected in the fact that, on average, firms located there are able to subcontract production and hold fewer days of inventory. Again, the differences are significant. The firms in Johannesburg, the East Rand and Pretoria also seem to have more dynamic relationships with their primary suppliers.

**Table 5: Enterprise survey 2007 indicators of agglomeration**

	Johannesburg/ East Rand/ Pretoria	Cape Town	Port Elizabeth	Durban
<b>Intermediates</b>				
% of firms that sell intermediate inputs	36%	24%	11%	25%
% of firms that sell more than half of output to a principal buyer	25%	48%	40%	20%
% of domestic inputs	86%	77%	78%	87%
% of foreign inputs	14%	23%	22%	13%
Days inventory held	20	23	32	23
Years relationship with primary supplier	10	13	12	14
% of firms that subcontract production	16%	17%	13%	6%
<b>Labour</b>				
Skilled production workers as % of workforce	41%	56%	74%	58%
Unskilled production workers as % of workforce	32%	23%	6%	20%
Temporary employees as % of workforce	11%	20%	5%	10%
Avg. monthly compensation				
Production workers	R3 554	R2 912	R3 500	R2 979
Professionals	R8 907	R7 917	R8 120	R5 079
Managers	R14 094	R14 141	R16 383	R11 861
Educational attainment of production workers				
7-12 years	60%	77%	77%	75%
13 years and more	13%	5%		5%

(Source: Krugell and Rankin, 2009)

The labour market information in Table 5 shows that on average, firms in Gauteng employ fewer skilled production workers as a percentage of the work force and there are more firms that employ more workers with higher levels of education. One-way ANOVA indicates that these differences between the firms in the greater Gauteng and those in the coastal cities are significant. The 2007 Enterprise survey also asked firms about average monthly compensation of workers and Table 5 shows that the average firm in Gauteng pays higher wages to production workers and professionals. Firms in Port Elizabeth paid the highest monthly salaries to managers. One-way ANOVA indicates that these differences in the pay of production workers and professionals between the firms in the greater Gauteng and those in the coastal cities are significant.

In the case of the managers, the differences between the Gauteng and coastal firms are not significant.

Table 6 shows the indicators of agglomeration economies from infrastructure and knowledge spillovers. The survey also asked firms about major obstacles to the operations and it is notable that, on average, more firms in Cape Town indicated that access to land is a major obstacle. Compared to the firms in Gauteng, this difference is significant.

**Table 6: Enterprise survey 2007 indicators of agglomeration**

	<b>Johannesburg/ East Rand/ Pretoria</b>	<b>Cape Town</b>	<b>Port Elizabeth</b>	<b>Durban</b>
<b>Infrastructure</b>				
Major obstacle to operation				
Access to land	4%	10%		5%
Electricity supply	20%	14%	6%	13%
Transportation	5%	3%		6%
% firms experienced power outages in 2006	59%	41%	17%	21%
% firms that experienced insufficient water supply	7%	4%		4%
% firms that own/share a generator	23%	27%	8%	8%
% firms that use own transport to make shipments	56%	66%	74%	83%
<b>Knowledge</b>				
% firms that use email to communicate with clients	74%	90%	85%	88%
% firms that have an own website	44%	54%	53%	50%
% of firms that use foreign licensed technology	17%	13%	17%	6%

(Source: Krugell and Rankin, 2009)

In 2007, more of the firms surveyed in Gauteng and Cape Town experienced electricity supply as a major obstacle and they owned or shared a generator. The one-way ANOVA indicates the problems experienced with electricity supply in Johannesburg, the East Rand and Pretoria are significantly different from the incidence thereof in the coastal cities. It appears that the 2007 survey reached firms that use information and communication technology less intensively when compared to the firms in the 2003 survey. It is remarkable that smaller percentages of firms in Johannesburg, the East Rand and Pretoria appear to use email and an own website to communicate with clients and the difference is significant. Table 6 shows that, on average, a greater proportion of firms in the greater Gauteng and in Port Elizabeth use foreign licensed technology.

Taken as a whole, this description of the firm-level data that are available per city may indicate that agglomeration economies exist and that the location of a firm will influence its efficiency. Given that none of the surveys were designed to examine issues of the location of the firms, the items that do allow one to infer the existence of agglomeration economies per city reflect the dominance of the economy in Johannesburg, the East Rand and Pretoria as an agglomeration characterised by a diversity of intermediate inputs and thick labour market.

## 5. Concluding remarks

The aim of this address was to give a comprehensive overview of the broad relationship between globalization and local economic growth in South Africa over the years following the country's transition to democracy and its re-integration into the global economy. Given the country's inherited spatial inequalities, induced both by apartheid planning and geography, and the institutional extension of democracy to the local level through decentralization, the country's entry into the global economy might be a double edged sword. While it may stimulate economic growth it may also exacerbate spatial inequalities.

Accordingly, the address reviewed a number of recent studies which dealt with the spatial gaps and determinants of growth on a local level, the economics of South Africa's cities and the imperatives of making cities more inclusive engines of growth, and finally on the relationship between spatial inequalities, growth, the labour market and firms.

The main findings from this emerging body of research stress the 'lumpiness' of economic growth in South Africa, and suggests that spatial inequalities are quite persistent. But this does not preclude more inclusive forms of development. Ways in which to ensure that more people (and localities) can benefit from the spatial growth points in the country include investments in human capital, investments in physical capital such as transport services and infrastructure, and investments in urban planning. Improving the structure, functioning and competitiveness of South Africa's cities is probably one of the best development strategies in which the people of South Africa can invest.

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