

THE QUALITY OF METROPOLITAN CITY LIFE IN SOUTH AFRICA

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ABSTRACT. In South Africa more than 32% of the population resides in only six metropolitan areas, and with rapid urbanization (exceeding 4% per annum) the quality of metropolitan city life will increasingly become an indication of the overall quality of life in the country. Some recent evaluations of the growth of South Africa's urban areas have been negative, prophesizing increases in unemployment, poverty, crime and, environmental degradation. In this paper we construct an index for South Africa's six metropolitan cities that consist of both economic and non-economic quality of life indicators, including measures of the quality of the environment and of life. By comparing how this index and its components have changed over the period 1996 to 2001 (and in some cases 2004) we are able to objectively evaluate city quality of life, and distinguish between the economic and non-economic quality of life in the various cities. We also use regression analysis to determine the extent to which the various cities have been able to turn improvements in per capita incomes (economic wellbeing) into non-economic quality of life as reflected for instance in a better environment, higher literacy and longer lives.

Key Words: Quality of life, urbanisation, cities, South Africa.

JEL Classification numbers: R12, R23, O18, J67

Version : 27 March 2006

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1. Introduction

Democratic governments throughout the world generally aim to raise the quality of the life of their citizens. In South Africa, the first democratically elected government brought issues of the quality of life of all citizens to the fore, after decades of racially discriminating policies left the country with high levels of inequality and serious overall poverty (see May 1998). Indeed, the South African Constitution (adopted in 1996) states explicitly that it is guided by the imperative to “improve the quality of life of all citizens”.

This imperative is to be seen against the background of a country that is rapidly urbanising. The rate of urbanisation, at 4% per annum, is one of the highest in the world and at least double that of other developing countries in Latin America and Asia. By 2001 already 32% of the country’s population resided in only six metropolitan cities. These trends are not only confined to South Africa, but are shared by other countries in Africa. The implication is that the quality of life in Africa’s cities, including South Africa’s cities, will increasingly depend on the quality of life its cities can offer. As remarked by May (1998) “more than half (55%) of the population of South Africa now lives in urban areas, and so the urban policy context is of vital significance for addressing poverty and inequality”.

Despite significant urbanisation in South Africa, little rigorous or objective analysis of the quality of life in metropolitan areas has been done. Most commentators, policy makers and the popular media have been warning against the “problems” of urbanisation (see e.g. Hartleb, 2005). Scientific studies on the quality of life of South Africa’s cities and the impact of urbanisation on the quality of city life remain relatively few¹ and have focused on subjective indicators of quality of life. For instance Møller and Pillay (1998) measured the quality of life in Ethekwini (Durban) in 1998, using a number of subjective indicators of quality of life.

In this paper the focus is on the quality of life in South Africa’s six metropolitan cities, measuring it by way of a number of objective indicators. These six cities are Johannesburg, Ekurhuleni (East Rand), Tshwane (Pretoria), Ethekwini (Durban), Nelson Mandela Metropolis (Port Elizabeth) and Cape Town. In objectively measuring the quality of life in these cities, we recognise that it is a multidimensional concept that needs to encompass both economic and non-economic quality of life (see e.g. McGillivray, 2005) as well as the quantity of life (Becker, Philipson and Soares, 2005). As far as non-economic quality of life is concerned, we include a number of measures of the quality of the environment in the various cities and in doing so we contribute to the small but growing literature that aims to incorporate environmental indicators into the measurement of human well-being (see Zaim, 2005). We also consider the quantity of life in South Africa’s cities and we attempt to measure the degree to which economic and non-economic indicators of quality of life are correlated in South Africa’s cities. Finally, following McGillivray (2005) we

¹ In South Africa, the “Quality of Life Trends Project” was started in the early 1980s to track changes in how South Africans perceive the quality of their lives (the website can be accessed at http://www.ru.ac.za/institutes/iser/research/20_further.html). The project use 35 subjective indicators of quality of life, but does not *per se* focus on urban areas. For the various reports from this project see Møller (1989;1992b, 1994, 1995c). See also Møller & Schlemmer (1983;1989); Møller, (1998, 1999); and Møller, Dickow & Harris (1999).

compile additional non-economic measures or indices of quality of life for South Africa's cities using the variation in the Human Development Index as well as from an own index of the non-economic quality of life that is not explained by per capita income.

The paper is structured as follows. Section 2 puts South Africa's metropolitan cities and the challenges that they face in the context of geography, history and the academic literature. In section 3 the concept of the quality of life is outlined and economic and non-economic indicators of the quality of life, as well as indicators of the quantity of life, are discussed. Section 4 presents the indicators of the quality of life in South Africa's metropolitan cities. Indicators of the quantity of life are put forward in section 6. Section 6 examines the relationship between the economic and non-economic indicators of the quality of life in South Africa's cities. In this section an own indicator of non-economic quality of life is constructed. Economic quality of life is also compared with the environmental quality of South Africa's cities. In section 8 changes in the quality of life over time are examined. And the metropolitan cities are ranked according to economic and non-economic indicators in 1996, 2001 and 2004. Section 9 concludes.

2. South Africa's Metropolitan Cities: Context and Challenges

2.1 Location

South Africa has six metropolitan municipalities, which are its six largest cities. These are the City of Cape Town, eThekweni (Durban), Ekurhuleni (East Rand), the City of Johannesburg, Nelson Mandela Metropole (Port Elizabeth) and the City of Tshwane (Greater Pretoria). The locations of these six cities are shown in the map below in figure 1.

Figure 1: Geographical Location of South Africa's Six Metropolitan Cities

(This map makes the file too large to upload to the conference website, but we'll include it in the presentation)

(Source: Map drawn for this paper by Giscoe (Pty) Ltd, Potchefstroom)

In figure 1 above, South Africa's cities are shown in relation to basic national and international transport infrastructure (national roads, international airports, and harbours). Four agglomerations can be made out and area shown as the grey shaded areas: a large agglomeration almost in the centre of the country, which consists of three metropolitan cities close together (Johannesburg, Ekurhuleni, Tshwane) and then three smaller agglomerations on the coast (Cape Town, Nelson Mandela Metro and eThekweni Metro).

2.2 *Historical Perspective*

The historical factors that determined the location and development of South Africa's cities are discussed in greater detail from an economic perspective in Naudé & Krugell (2003a). For present purpose it may be useful to provide a brief background on the geographical location of the country's cities. The inland agglomeration of Johannesburg, which together with the City of Tshwane (formerly Pretoria) can be seen as South Africa's primate city (Naudé & Krugell, 2003b) was established following the discovery of significant gold and platinum deposits, the mining and distribution of which was energy and transport intensive, creating favorable infrastructure also for manufacturing development. Apart from the inland agglomeration around Johannesburg-Tshwane complex the remainder of South Africa's metropolitan areas is located at the coast. These coastally located cities predate the establishment of the Johannesburg-agglomerations and developed as the result of the maritime nature of the country's European colonization. Thus cities such as Cape Town, Nelson Mandela Metro and eThekweni (Durban) owe their existence to their locations in facilitating ocean transport between Europe and the East. Even today these cities retain an important influence on the South African economy, as South Africa counts amongst the top 12 maritime nations in the world (Chasomeris, 2005).

2.3 *Current Urban Challenges: A literature review*

The academic literature on cities in South Africa is made up of divergent contributions from urban and regional planners, economic geographers and economists.

Firstly, there are studies that do not focus specifically on cities but examine different topics at sub-national level. The topics include issues of agriculture, manufacturing, tourism, infrastructure, employment, poverty and inequality at a provincial or local level and the work has a strong development focus. For example, on infrastructure, Le Roux Booysen (2003a) examined provincial disparities in progress on reconstruction and development. He found that provinces that are more urbanised have advantages in the delivery of infrastructure, the facilitation of demographic transition and the improvement of standards in secondary education, over the more rural provinces. At a local level Smith and Hanson (2003) examined the related development issue of access to water for the urban poor, specifically in Cape Town. They found that commercialisation and the current "basic needs" approach are creating territorial variation in service delivery and widespread water cut-offs. In another example of work linking "delivery" and spatial issues, a study of housing delivery in the Free State by Marais and Krige (2000) showed that cities in the province have been neglected in terms of housing investment. They do, however, find evidence that the majority of beneficiaries of housing subsidies fall in the lowest income category. On housing and urban development Harrison, Huchzermeyer and Mayekiso (2003) explores the fragmentation in

urban areas in post-apartheid South Africa. Their work examines topics of planning approaches, HIV/Aids, housing, integrated urban development and the compact city debate.

The second strand of research focuses on demographics and issues of employment poverty and inequality at the level of cities and towns. Posel (2003) examined the collection of national household survey data in South Africa and concluded that questions of labour migration have received too little attention in recent revisions of the surveys. In related work examining migration patterns in post-apartheid South Africa, Posel (2004) found that temporary internal labour migration appears to have increased, particularly because of the rise in female migration. In a study of the Western Cape, Oosthuizen and Nieuwoudt (2003) found that the poor are most often located in urban areas, have low levels of education and live in relatively large households that are often headed by women. Cornwell and Inder (2004) studied rural-urban migrants and found that they do well at finding formal employment.

Opposed to this broad cross-section of topics that are addressed at a sub-national level, a third category includes the work that looks at rural issues and questions of the urban-rural divide. For example, there is a range of articles discussing rural economies from the perspective of land reform (see Bernstein, 2003). Robinson (2003) examined rural settlement patterns in the Eastern Cape and found that the land tenure system and risk-spreading strategies of households are keeping people on the land, although their existence is not subsistence-based but linked to the urban economy. Le Roux Booysen (2003b) found that urban-rural inequalities in access to health care services persist and discriminate against the poor.

Fourthly, it is possible to group together studies that focus specifically on cities. There are studies of urban vulnerability (Nomdo & Coetzee, 2002), social justice (Visser, 2001), urban empowerment (Lotter, 2002), quality of life (Moller, 2001a, 2001b; Moller & Devey, 2003) and poverty (Rogerson, 2001a). Here, too, the focus is on issues of households, poverty and inequality, but specifically within the urban context of cities and towns. A related part of this literature addresses mostly planning and management issues. For example Buthelezi and Dollery (2004) provided an exploratory analysis of local government failure, and Cameron and Sewell (2003) looked at performance management in the Cape Town municipality.

This work also fits in with the efforts of the South African Cities Network. The SACN is a network of South African cities and partners that encourage the exchange of information, experience and best practices on urban development and city management (see www.sacities.net). The SA Cities Network Economic Development Programme, which is based on a partnership between cities and the Department of Trade and Industry (DTI), has identified a number of strategic issues for South African cities:

- The role of global city-regions in the global, regional and national economy, and the implications for coordination of the South African regional and urban policy agenda;
- The notion of 'globally competitive cities' within the context of global inequalities and the limitations of promoting inward investment through place marketing and competitive bidding wars;
- Re-conceptualising local economic development (LED) policies and strategies;
- Re-conceptualising the economic development function of municipalities;
- The development of explicit social cohesion and poverty eradication strategies as part of economic development policies, both locally and nationally, in order to promote equity, socio-spatial integration, participation and inclusion within cities.

These strategic issues are also reflected in the fifth strand of the literature that examines local governments from the perspective of fiscal decentralisation and local economic development initiatives. The fiscal decentralisation literature provides the public economics perspective on the devolution of decision making and the challenges facing provinces and local government in South Africa. Niksic (2004) for example re-examined the decentralisation strategy specifically from the perspective of local governments, and Ntsebeza (2004) looked at the dilemmas of traditional authorities and land administration. Also, related literature studies the financial aspects of decentralisation from the point of view of sub-national taxation; specifically local property taxes (see for instance Bell & Bowman, 2002).

Together with the above public economics approach to fiscal and financial questions of provinces and local governments, there is further literature on their economic development challenges. The focus is specifically on Local Economic Development (LED) initiatives and the Integrated Development Planning (IDP) processes currently being undertaken in South Africa. Nel (2001) provides a review and assessment of the status of LED initiatives whilst Nel and Binns (2001) reviewed the policy and legal developments (Nel & Binns, 2001) and provided three case studies of the LED and IDP processes (Binns & Nel, 2002; see also Nel & Rogerson, 2005).

In conclusion, the literature shows that cities and towns in South Africa face a number of different challenges of economic development, job creation, poverty alleviation and service delivery. With such a wide field of inquiry the rest of this paper focuses specifically on issues of the quality of life in the metropolitan cities.

3. Methodology

3.1 The concept of quality of life

According to Veenhoven (2004:6) “human well-being” can be seen as synonymous with “quality of life”. This paper’s foremost concern is therefore with measures of human well-being, both economic and non-economic. The measurement and interpretation of measures of the quality of life have been rather elusive. One of the difficulties in measuring quality of life lies in its multidimensional nature, which seems to have resisted attempts to compile overall measures or indices of human well-being (see Veenhoven, 2004). As a result of this difficulty many researchers by-pass the objective measurement of quality of life, opting instead to ask people directly how satisfied they are with life (see e.g. Møller, 1998). Veenhoven (2004) contains a good overview of subjective measures of human well-being. Despite the usefulness of taking such subjective measurements of quality of life (which is not without its own conceptual and interpretative difficulties) it remains necessary to keep appropriate objective indicators. The need for appropriate objective indicators of the quality of life is due to (a) the often close correspondence between subjective and objective indicators (see e.g. Møller, 2004), and (b) the need for information about the “actual state of problems and the effects of attempts to solve these” (Veenhoven, 2004:21).

Recently Becker *et al.* (2005:277) stressed that quality of life depends on both material and non-material aspects, including the quantity of life as reflected in health outcomes and life expectancy. McGillivray (2005) emphasizes the difference between economic wellbeing and non-economic wellbeing and points out that various countries all have different degrees to which economic wellbeing correlates with non-economic wellbeing.

Measuring accurately both economic and non-economic quality of life is compounded by the interrelationship between these aspects. For instance, one of the most widely used objective measures of the quality of life, the Human Development Index (HDI) of the United Nations have been recently described as being “redundant” since a purely material measure of well-being such as per capita income, tends to very highly correlated with the HDI (McGillivray, 2005: 338). In addition, as Veenhoven (2004: 1) points out, compiling the HDI is methodologically akin to “adding oranges and apples”. Furthermore, interpreting material measures of well-being² (such as per capita income) in a society marked by great income inequality remains problematic. In a recent survey of these issues McGillivray and Shorrocks (2005:194) remarked that “research questions concerning inequality and well-being remain open”.

3.2 Economic indicators of the quality of life

This paper does not attempt to settle the debate on the usefulness and strengths and weaknesses of the various indicators and measures of human well-being. However, one should bear in mind, given the discussion in 3.1, the importance of assessing both economic as well as non-economic well-being, and of being careful in constructing overall or summary indices of total well-being. The following sections report on various economic and non-economic indicators of well-being in the six metropolitan cities of South Africa.

As far as the selected economic indicators are concerned, Table 1 below shows the economic indicators, their expected relationship with quality of life, as well as the data sources, which will be used in the determination of the degree of economic well-being in the six metropolitan cities:

Table 1: Economic Indicators used in this study

Economic Indicators	Relationship with Quality of Life	Sources of Data
Population	Positive	Census Data form Statistics South Africa
Density	Positive	Census Data form Statistics South Africa
Poverty Rate	Negative	Census Data form Statistics South Africa
Unemployment Rate	Negative	Census Data form Statistics South Africa
Average Household Disposable Income	Positive	Census Data form Statistics South Africa
Gini Coefficient	Positive	Regional Economic Focus data from Global Insight
Average Annual Economic Growth Rate, 1996-2001	Positive	Census Data form Statistics South Africa
Wage per Worker, 2001	Positive	Census Data form Statistics South Africa
Average Annual Change in Real Wage per Worker, 1996-2001	Positive	Census Data form Statistics South Africa
Human Development Index, 2001	Positive	Regional Economic Focus data from Global Insight
Average House Price, 2001	Negative	ABSA, www.absa.co.za

The indicators contained in Table 1 above are to large degree standard variables used in measuring economic welfare. Income, and growth in income (as measured through wages

² Osberg and Sharpe (2005) propose that material (economic) measures for well-being should include measures that represent average consumption (e.g. per capita income), aggregate national accumulation of productive assets, income distribution as well as economic security.

per worker, disposable household income and changes in wages per worker), are measures that are widely used with respect to economic well-being. Economic theory posits a positive relationship between income and human well-being. The poverty rate is a measure that is determined by the income variable, and the Gini-coefficient measures the distribution of income amongst the population. Higher inequality is widely seen, in both economic as well as psychology literature, to be associated with lower overall human well-being or happiness (see e.g. Frey & Stutzer, 2002: 11-12)

In addition to these income-dominated measures, population and population density are also considered, as these reflect opportunities for human interaction and agglomeration advantages (e.g. economies of scale, positive externalities). Whilst a positive relationship is generally posited between these and human well-being, seeing that the relationship between urbanisation and per capita income is a generally positive one (Freire & Polese, 2003), it is also possible that congestion, crime, and negative externalities (e.g. pollution and environmental degradation) associated with higher population and density levels may lower human wellbeing past some point (Fay & Opal, 2000). Finally, house prices are also considered, as these indicate the cost of living in a particular city and also reflect the demand for housing relative to supply. In terms of the cost of living, high house prices would be negatively correlated to wellbeing. High house prices may however reflect on the desirability of a location, and as such be positively related to human wellbeing (Rappaport & Sachs, 2003).

3.3 Non-Economic indicators of the quality of life

The economic indicators of the quality of life, as discussed in the previous section tend to be dominated by income-related measures, which as pointed out by Gasper (2004:3), have ignored “large areas of well-being”. In contrast, non-economic measures of the quality of life tend to be more diverse, reflecting the richness of human life. A selection has to be made of such measures to report in the case of South Africa’s cities. This selection was determined by the availability of data. The following table shows the non-economic indicators, their expected relationship with quality of life, as well as the data sources, which will be used in the determination of the degree of human well-being in the six metropolitan cities.

This selection of non-economic indicators of quality of life follows the lead of a number of internationally reported measures such as literacy, life expectancy and crime rates. A number of environmental and climate measures, taking it as a point of departure that a good quality of the natural environmental and climate increases human well-being (Rappaport and Sachs), are also included.

Table 2: Non-Economic Indicators Used in this study

Non-Economic Indicators	Relationship with Quality of Life	Sources of Data
Crime Rate	Negative	South African Police Service Data, www.saps.gov.za
Vehicle Count	Negative	Census Data form Statistics South Africa
Vehicles per Person	Negative	Census Data form Statistics South Africa
Literacy Rate	Positive	Census Data form Statistics South Africa
Forests, water bodies & wetlands	Positive	Regional Economic Focus data from Global Insight
Degraded land	Negative	Regional Economic Focus data from Global Insight
Built-up land: Residences	Positive	Regional Economic Focus data from Global Insight
Built-up land: Commerce	Positive / negative	Regional Economic Focus data from Global Insight
Mines	Negative	Regional Economic Focus data from Global Insight
Average Annual Rainfall	Positive	Regional Economic Focus data from Global Insight
Average Annual Temperature	Positive	Regional Economic Focus data from Global Insight
Variation in Annual Mean Temperature	Negative	Regional Economic Focus data from Global Insight
Coastal	Positive	Regional Economic Focus data from Global Insight
Proportion of population older than 75 years of age	Positive	Regional Economic Focus data from Global Insight

These environmental measures include average temperatures (more balmy temperatures are preferred), variations in annual temperatures (more stable temperatures are preferred), and measures relating to land use (such as land degradation, built-up land, and bodies of forests and water). In our choice of these variables we were led by data availability. It is common in indices of environmental quality to include CO²-emissions (Zaim, 2005), which are unfortunately not available on the city-level.

3.4 Indicators of the quantity of life

In section 3.1 it was pointed out that Becker *et al.* (2005:277) recently stressed that human well-being depends on both material and non-material aspects, including the quantity of life as reflected in health outcomes and life expectancy. This section reports on three variables widely seen as reflecting the quantity of life, namely the proportion of the population older than 75 years of age, the life expectancy at birth, and the HIV/AIDS prevalence rate (the latter is strongly associated with declining life expectancy). The following table shows the indicators, their expected relationship with quality of life, as well as their data sources, which will be used to determine the quantity of life in the six metropolitan cities in South Africa:

Table 3: Quantity of Life Indicators

Indicators of Quantity of Life	Relationship with Quantity of Life	Sources of Data
Population >75	Positive	Regional Economic Focus data from Global Insight
Life Expectancy	Positive	States of Cities Report, 2004
HIV Prevalence Rate	Negative	South African Cities and HIV/AIDS: Challenges and Responses Report, 2004 And Quantec Research Easydata

4. Economic Indicators of Quality of Life in South Africa's Cities

In Table 4 below, some basic socio-economic indicators of economic well being in South Africa's six cities are reported. Before discussing the contents of Table 4, a word on the data utilized is in order. As indicated in Tables 1- 3 above, most data used in this paper were obtained from the 1996 and 2001 Census data of Statistics South Africa. The latter date is of the most recent census in South Africa. Little reliable and consistent data on a city level is available for subsequent periods. Data on house prices were obtained from ABSA's house price indicators (see www.absa.co.za) and data on non-economic indicators of well being such as the HDI, Gini-coefficient and environmental profiles were obtained from Global Insight's Regional Economic Focus (REF). HIV/AIDS data were obtained from the South African Cities Network (www.sacn.co.za) and Quantec Research's Easydata (www.quantec.co.za).

Table 4: South Africa's Cities in 2001: Socio-Economic Status

City (Metropolitan government)	South Africa's Cities in 2001: Socio-Economic Status					
	Population	Density	Poverty Rate	Unemployment Rate	Average Household Disposable Income	Gini Coefficient
City of Cape Town	2,954,774	582.91	23.0%	25.0%	R 63,300	0.58
eThekweni Metropolitan (Durban Unicity)	3,077,928	1,095.50	32.2%	37.8%	R 56,811	0.60
Ekurhuleni Metropolitan (East Rand)	2,448,131	926.58	30.3%	38.1%	R 47,207	0.58
City of Johannesburg	2,672,006	2,016.50	25.9%	30.9%	R 85,560	0.60
Nelson Mandela Metropolitan (Port Elizabeth)	1,078,477	242.81	39.6%	42.8%	R 17,474	0.57
City of Tshwane (Greater Pretoria)	2,294,632	410.51	30.6%	29.7%	R 60,783	0.60
Total	14,525,948				R 331,134	
As % of South Africa	31.94%				51.30%	

From Table 4, it can be seen that in 2001, there resided 14.5 million people (about 32% of the total) in South Africa's six cities. The city with the largest population is Durban (the eThekweni Metro) with just over 3 million people, followed by Cape Town with 2.9 million people. Although these coastal cities contain as individual cities the highest numbers of people, the map in figure 1 indicated a significant interior concentration of people consisting of three interlinking cities of Johannesburg, East Rand and Pretoria. Table 4

shows that 7.2 million people reside in this area, which if taken as a single socio-economic agglomeration, would constitute South Africa's primate city.

As far as density is concerned, Table 4 shows that although Johannesburg may not be the largest in terms of population, it has by far the greatest population density, with more than 2000 persons per km². This is almost twice the density of the second most densely populated city, namely Durban.

In terms of economic wealth, Table 4 shows that Cape Town and Johannesburg have the lowest poverty rates, with residents of Johannesburg having the largest disposable income. However, the Nelson Mandela Metro (Port Elizabeth) has the lowest overall income inequality (as measured by the Gini-coefficient) although it is the city with the highest poverty rate. It is also the city with the highest unemployment rate. Generally, the table suggests a close correlation between unemployment and poverty (the correlation coefficient between poverty and unemployment is the highest of the variables in the table, being 0.88), with the latter being the lowest in Cape Town and the highest in Nelson Mandela Metro. Losing one's job or failing to find one in a South African city may therefore be a straight path to poverty.

Table 5 below contains some further indicators of economic well being in South Africa's cities. It also contains the Human Development Index (HDI), which is a composite of economic indicators such as income, with non-economic indicators such as life expectancy and literacy.

Table 5: Indicators of Economic Wellbeing in South African Cities

City (Metropolitan government)	Average Annual Economic Growth Rate, 1996-2001	Wage per worker in 2001	Annual Average Change in real wage per worker, 1996-2001	Human Development Index, 2001	Average House Price, 2001
City of Cape Town	2.41%	R 56 000	-0.16%	0.70	R 372 707
EThekweni Metropolitan (Durban Unicity)	3.16%	R 50 000	-2.02%	0.67	R 282 182
Ekurhuleni Metropolitan (East Rand)	2.17%	R 49 000	-0.81%	0.67	R 274 563
City of Johannesburg	4.60%	R 61 000	-0.88%	0.72	R 336 018
Nelson Mandela Metropolitan (Port Elizabeth)	4.58%	R 52 000	-0.61%	0.66	R 267 553
City of Tshwane (Greater Pretoria)	5.22%	R 55 000	-1.48%	0.70	R 357 299

Table 5 above shows that in 2001, Johannesburg enjoyed the highest HDI, as well as the highest wage per worker (R 61 000 per annum). Generally, wages in South Africa's coastal cities appeared to be lower than in the interior cities. In real terms, wages in all these cities contracted over the five years 1996 to 2001, with the largest contractions in Durban and Tshwane. The slowest contraction in wages was in Cape Town. Comparing the changes in real wage per worker with changes in unemployment, we find a positive correlation of 0.68. Indeed, the city with the highest rate of increase in unemployment was Cape Town (seeing a 28% increase in its unemployment rate) and the city with the lowest increase in unemployment was Tshwane (with an 11% increase).

Figure 2 below contains a scatterplot depicting the positive relation between changes in unemployment and changes in wages per worker. This would clearly indicate that in those cities where wage increases were contained, increases in unemployment were smaller.

Figure 2: Scatterplot of relationship between changes in unemployment rates and wages per worker in South Africa's Cities, 1996-2001

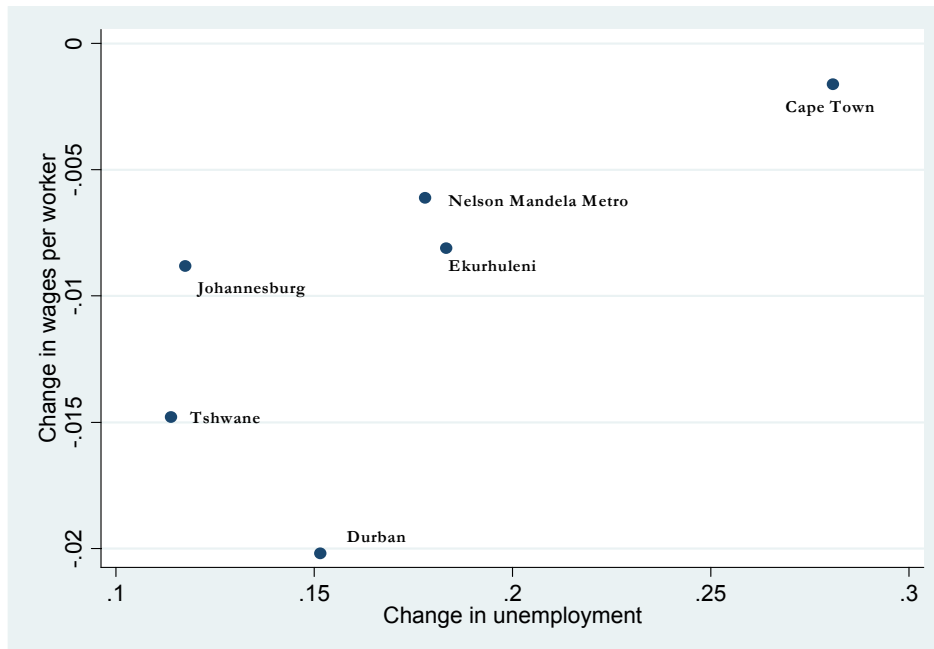


Table 5 also shows that the highest average annual economic growth rate over the period 1996-2001 was enjoyed by the City of Tshwane (Pretoria) of 5.22%, followed by Johannesburg and Nelson Mandela Metropolitan.

House prices often reflect the underlying quality of life of a city, as well as a city's economic importance or productivity (Rappaport & Sachs, 2003:8). Table 2 shows that according to ABSA's House Price information, in 2001 the highest average house price was fetched in the City of Cape Town (R 373 707). This was followed by Pretoria and Johannesburg. Cape Town's relatively lower average wage coupled with higher house prices may reflect the fact that it enjoys a higher quality of life due in part to its coastal location. The argument is that people are willing to accept lower wages and pay higher prices for housing to be living in a coastal city (Stover & Leven, 1992; Rappaport & Sachs, 2003).

5. Non-Economic Indicators of Quality of Life in South Africa

In the previous section one non-economic indicator of quality of life, namely the HDI, was already mentioned. According to this measure, Johannesburg, Cape Town and Pretoria (Tshwane) enjoyed the highest standards of living. Another general indicator of the quality of life that reflects both on economic quality of life (such as due to higher productivity) as well as non-economic quality of life (such as scenery, climate, low crime, etc.) was also reported indirectly. This is population density. According to Rappaport and Sachs (2003) population density within a country reflects the fact that, "people vote with their feet". The previous section showed that population density is highest in Johannesburg, Durban and Ekurhuleni. Given that population density is highest in South African cities with higher wages per worker, higher growth and generally located in the interior, leads one to the working hypothesis that this population density reflects high productivity (economic quality

of life) rather than non-economic quality of life. In Table 6 below this hypothesis is investigated further.

Table 6: South Africa's Cities in 2001: Diverse Non-Economic Indicators

South Africa's Cities in 2001: Diverse Non-Economic Indicators						
City (Metropolitan government)	Crime Rate*	Vehicle Count	Vehicles per person	Literacy rate	Population	Density
City of Cape Town	1.64%	831516	0.28	86.2%	2,954,774	582.91
eThekweni Metropolitan (Durban Unicity)	11.21%	449358	0.15	82.6%	3,077,928	1,095.50
Ekurhuleni Metropolitan (East Rand)	6.89%	686565	0.28	83.1%	2,448,131	926.58
City of Johannesburg	16.20%	880686	0.33	87.1%	2,672,006	2,016.50
Nelson Mandela Metropolitan (Port Elizabeth)	2.17%	190216	0.18	83.7%	1,078,477	242.81
City of Tshwane (Greater Pretoria)	5.96%	666339	0.29	82.9%	2,294,632	410.51
Total		3704680	0.26		14,525,948	
As % of South Africa	44.08%	51.70%			31.94%	

*The crime rate is the percentage of all murders, attempted murders and robberies that occurred in a city in 2001

Table 6 above contains some non-economic indicators of wellbeing, such as the crime rate, the number of vehicles per population (which can reflect congestion/productivity) and literacy. It shows that the crime rate is significantly lower in coastal cities such as Cape Town (with only 1.6% of the country's serious crime being reported there in 2001) and Nelson Mandela Metro, and significantly higher in Johannesburg and Ekurhuleni and Durban. In Table 6, the population density has been included again to illustrate that there exist a positive correlation between population density and crime rates in South Africa's cities. This reflects the fact that density, or agglomeration, not only benefits businesses through increasing returns to scale, but also criminal activity.

The vehicle count, as expressed as the number of vehicles per population, is clearly the highest in the Johannesburg – Ekurhuleni and Pretoria area, high in the Cape Town area, and much lower in the Durban and Nelson Mandela Metro area.

Table 7 below contains further measures of non-economic quality of life in South Africa's cities, in particular measures relating to the quality of the natural environment. In particular, the percentage of a city's surface area covered by forests, water bodies and wetlands may be indicative of natural beauty. In contrast, the percentage of degraded land would indicate an absence of natural beauty. The percentage of built-up land in a city could also provide a proxy indicator for the availability of open spaces and access to nature; the percentage of residential buildings is also a proxy for the access to housing.

Table 7: Environmental Quality: Selected Indicators for 2004

City (Metropolitan government)	Size (km ²)	Forest, water bodies & wetlands	Degraded land	Built-up land: residences	Built-up land: commerce	Mines
City of Cape Town	5,069	4.2%	6.23%	11.28%	1.29%	0.15%
eThekweni Metropolitan (Durban Unicity)	2,810	2.3%	6.97%	20.60%	2.30%	0.07%
Ekurhuleni Metropolitan (East Rand)	2,642	3.5%	0.00%	23.45%	3.61%	4.49%
City of Johannesburg	1,325	2.3%	0.00%	55.81%	6.01%	4.10%
Nelson Mandela Metropolitan (Port Elizabeth)	4,442	1.4%	0.10%	4.59%	0.85%	0.12%
City of Tshwane (Greater Pretoria) Pretoria	5,590	38.2% 22.8%	17.41% 0.00%	16.58%	1.07%	0.22%

*(Greater Pretoria's significant % of land cover consisting of forest is especially found in Wonderboom (51%) and Ga-Rankuwa (43%) areas.)
(Source of Data: Global Insight Regional Economic Focus, November 2005)*

From Table 7 can be seen that the Greater Pretoria (Tshwane) area is endowed with the largest percentage of forests, water bodies and wetlands than any city in South Africa – this is even if the central area of Pretoria is taken on its own, without the outlying areas such as Wonderboom and Ga-Rankuwa. Apart from Pretoria, it can be seen that Cape Town has the highest percentage of forests, water bodies and wetlands – in addition to being a coastal city. It also has amongst the lowest percentage of build-up land, only lagging Nelson Mandela Metro in this regard.

If the percentage of land area covered by mining operations can be judged to have a negative impact on environmental quality and quality of life, then from Table 7 can be seen that Ekurhuleni en Johannesburg are the most disadvantaged in this regard. The latter two cities are also the most densely built-up, with over 60% of Johannesburg's land area covered by residential and commercial buildings.

Finally, Table 8 below contains information on the climatic conditions in South Africa's cities. Quality of life is generally regarded as better in cities with higher rainfall and less variable annual temperature.

Table 8: South Africa's Cities in 2001: Climate

South Africa's Cities in 2001: Climate				
City (Metropolitan government)	Annual Average Rainfall	Average Annual Temperature	Variation in Annual Mean Temperature	Coastal (Yes/No)
City of Cape Town	683	17	3.03	Yes
eThekweni Metropolitan (Durban Municipality)	939	21	2.77	Yes
Ekurhuleni Metropolitan (East Rand)	703	16	3.99	No
City of Johannesburg	655	16	3.81	No
Nelson Mandela Metropolitan (Port Elizabeth)	502	18	3.07	Yes
City of Tshwane (Greater Pretoria)	450	19	4.25	No

Table 8 above indicates that climatic conditions are generally more favourable in South Africa's coastal cities than in the non-coastal cities. For instance, rainfall in Cape Town and Durban tends to be higher than in most inland cities (except in this case, Ekurhuleni). Also, average annual temperatures are marginally higher along the coast, and the variations in annual temperature (between highest and lowest average temperatures) are much less in coastal cities such as Durban, Cape Town and Nelson Mandela Metro.

6. Indicators of the quantity of life

The various commonly used measures of the quantity of life were discussed in section 3.4 above. In essence, quantity of life is determined by life expectancy. Low life expectancy can be considered as one of the demographic determinants that have contributed to slow economic growth in most developing countries (Bloom and Sachs, 1998).

In South Africa's cities, one of the most significant threats to life expectancy, and therefore human well-being, is the HIV/AIDS pandemic (Van Donck, 2002). Indeed, as stressed by Van Donck (2002) the rates of HIV/AIDS infection is higher in South Africa's urban areas than in rural areas.

There is also a linkage between HIV/AIDS and economic measures of well-being, since poor households affected by HIV/AIDS are likely to be pushed into deeper poverty; whereas households which are on the brink of the poverty line will lose the fragile security they had and end up below the poverty line. As a result, social divisions and inequality will be reinforced (van Donk, 2002).

Table 9 below contains various indicators of the quantity of life in South Africa's cities. In the second column, the table contains the HIV prevalence rate for the six metropolitan cities.

Table 9: Indicators of the Quantity of Life in South African Cities

City (Metropolitan government)	HIV Prevalence Rate, total (% of population aged 15-49) in 2004	Life Expectancy in 2003 (total)	Percentage of population > 75 years in 1996	Percentage of population > 75 years in 2001
City of Cape Town	13%	62	1.83%	1.79%
eThekweni Metropolitan (Durban Unicity)	14.2%	45	1.26%	1.37%
Ekurhuleni Metropolitan (East Rand)	12.3%	52	1.10%	1.19%
City of Johannesburg	29.8%	52	1.59%	1.70%
Nelson Mandela Metropolitan (Port Elizabeth)	26%	52	1.55%	1.65%
City of Tshwane (Greater Pretoria)	11.4%	52	1.52%	1.66%

(Sources of data : *South African Cities and HIV/AIDS: Challenges and Responses (2004)* and *State of Cities Report 2004*, published by the South African Cities Network, www.sacn.co.za and Quantec Research, www.quantec.co.za)

Table 9 above shows that in 2004, the City of Johannesburg had the highest incidence of HIV, at 29.8% followed by Nelson Mandela Metro (26%). HIV prevalence in the City of Cape Town and Tshwane (Greater Pretoria) was much lower, at 13% and 11.4% respectively.

The HIV-prevalence data in Table 9 should be read in conjunction with the data on life expectancy in the various cities. The third column of Table 9 above shows that in 2003 the City of Cape Town (which had a lower HIV-prevalence rate) had a much higher life expectancy at birth (namely 62 years) than any of the other metropolitan cities. It is also noticeable that eThekweni (Durban) has a significantly lower life expectancy (45 years) than any of the other South African cities.

Finally, in the fourth column of table above, the proportion of the population older than 75 years of age in the various cities are depicted for both 1996 and 2001. It can be seen that in all of the six cities, the proportion of people older than 75 years has grown. Another noticeable feature is that the cities with the highest proportions of older population are Cape Town (1.79% in 2001) and Johannesburg (1.70%) but that in the case of Cape Town the proportion has declined slightly between 1996 and 2001 whilst in the case of Johannesburg there has been a significant increase – perhaps suggesting that the overall quality of life in Johannesburg had improved relative to that in Cape Town over the period.

From the discussion in this section it seems as though the city that offers the overall best quantity of life is Cape Town, which leads the field in terms of life expectancy and the proportion of old people. It also has one of the lowest HIV-incidences in the country. With regard to other coastal cities the situation is mixed. eThekweni has a large number of old people, but a low (lowest) life expectancy. Similarly the other coastal city, Nelson Mandela Metro, contains the lowest number of people above 75 years and has a high HIV-prevalence rate (2nd highest) and life expectancy in the middle - ranges (52 years).

7. Relationship between the economic and non-economic indicators of the quality of life in South Africa's cities

7.1 Relationship between HDI and Per Capita Income

As was pointed out in the introduction, there is agreement in the international literature that human well-being is a multidimensional concept, encompassing both economic and non-economic dimensions. As recently documented by McGillivray (2005:337-338) there is a long history of efforts to refocus attention away from established economic (or monetary) measures of wellbeing, such as per capita income, towards measures to better capture non-economic (non-monetary) dimensions of quality of life. The United Nations' Human Development Index (HDI), reported above, is one of the most widely used objective measures of non-economic quality of life in use today. A major shortcoming of such a measure however, is that it is most often than not highly correlated with per capita income. McGillivray (1991) finds a correlation coefficient of 0.89 between HDI and GNP per capita, and suggested that the HDI, as a true reflection of non-economic quality of life, may thus be redundant.

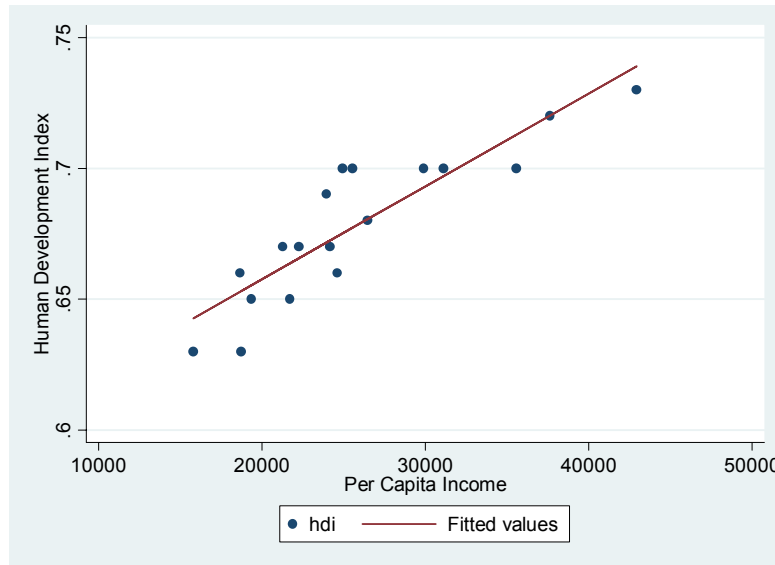
In the present case, there is a similarly high positive correlation between per capita income and HDI across South Africa's cities, of 0.84. A regression of the log of the HDI on the log of per capita income yielded the following estimates.

Table 10: Regression results of HDI on per capita income across South Africa's six Metropolitan Cities (data pooled for 1996, 2001 and 2004); Dependent variable $\ln\text{HDI}$

Variable	Coefficient
Constant	-1.87 (16.8)***
Per capita income	0.146 (8.59)***
Adj. $R^2 = 0.81$	

Figure 3 below shows the relationship between HDI and per capita income in South Africa's six metropolitan cities (data for the years 1996, 2001 and 2004 pooled). The fitted regression line indicates the strong positive correlation between HDI and per capita income.

Figure 3: Relationship between HDI and Per Capita Income in South Africa's Six Metropolitan Cities, 1996, 2001 and 2004



To an extent the positive relationship between HDI and per capita income is due to the fact that per capita income is one component of the HDI – the other two being literacy and life expectancy.

7.2 *An Own Composite Indicator of Non-Economic Quality of Life*

Given that the HDI is not an exclusive indicator of the non-economic quality of life, as it contains per capita income, this paper makes use of an own non-economic quality of life index that does not contain directly income or any other monetary aspects of the quality of life. Due to data availability and ease of interpretation this approach follows the practice as in Prescott-Allen (2001) by calculating a non-economic quality of life index as the equally weighted average of measures of life expectancy, literacy and income equality. To ensure scale equivalence the components are expressed to range between 0 and 100.

$$Q_1 = \left(\frac{\text{Life expectancy} + \text{Literacy} + (1 - \text{Gini coefficient})}{3} \right) \quad (1)$$

In calculating equation (1) above, life expectancy is proxied by the percentage of the population in a city that is older than 75 years of age; the literacy rate is taken as the percentage of population older than 15 that is functionally literate, and equality is measured by subtracting the Gini-coefficient from one. In Table 11 below the index and its components are shown for the six cities for 2004.

Table 11: Index of the Quality of Life in South Africa's Cities, 2004

City	Proportion of population older than 75 years of age	Gini-coefficient	Literacy rate	Quality of Life Index (Non-Economic)
Cape Town	1.7%	0.58	88%	44
Ethekwini (Durban)	1.4%	0.60	83%	41
Ekurhuleni (East Rand)	1.3%	0.58	86%	43
Johannesburg	1.8%	0.57	89%	45
Nelson Mandela Metro (Port Elizabeth)	1.7%	0.58	83%	42
City of Tshwane (Pretoria)	1.7%	0.59	84%	42

The table above shows that in 2004, the non-economic quality of life was highest in Johannesburg (45), Cape Town (44), Ekurhuleni (43) and lowest in Durban (41).

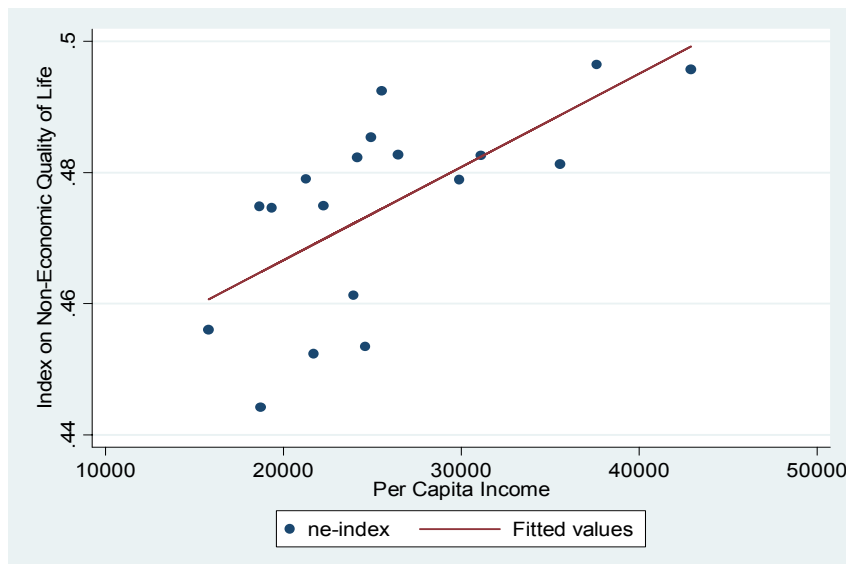
The correlation between this composite index of the non-economic quality of life and per capita income is still positive – with a correlation coefficient of 0.71. A regression of the log of this own measure on per capita income yields the following results.

Table 12: Regression results of an Own Index of Non-Economic Quality of Life on per capita income across South Africa's six Metropolitan Cities (data pooled for 1996, 2001 and 2004); Dependent variable logarithm of an Own Index

Variable	Coefficient
Constant	-1.32 (5.31)***
Per capita income	0.05 (1.85)***
Adj. R ² = 0.12	

Figure 4 below depicts the relationship between per capita income and our own index of the non-economic quality of life in South Africa's six metropolitan cities.

Figure 4: Relationship between Quality of Life and Per Capita Income in South Africa's Six Metropolitan Cities, 1996, 2001 and 2004



7.3 Residual Estimates of the Non-Economic Quality of Life

Given that both the HDI and this paper's own measure of the non-economic quality of life are correlated with per capita income, regression analysis is used in this section to obtain closer measures of the non-economic quality of life in South Africa's cities. These measures are obtained from the residuals from the following regression:

$$Q_{it} = \alpha + \beta y_{it} + \mu_{it} \quad (2)$$

Where Q_{it} is the measure of quality of life in city i in period t ($t= 1996, 2001, 2004$); HDI and the own index are used alternately; and y_{it} is per capita income in city i in period t , with μ_{it} the residual term.

The residual term can here be interpreted as the variance in Q (quality of life) that is not predicted by income per capita. It is therefore a more proper or independent measure of the non-economic quality of life in a city. McGillivray (2005:340) also shows that this residual term can be interpreted as “*a measure both of the success in converting economic well-being into non-economic well-being and of the non-economic well-being component*”.

The results from estimating equation (2) above with OLS using firstly HDI and secondly this paper's own measure of the quality of life were contained in Tables 11 and 12 above. The residuals μ_{it} was in each case saved and used as an indicator. For the six cities, the various non-economic indicators of the quality of life (HDI, own indicator, HDI-residuals, Own-residuals) as well as the economic quality of life (per capita income) is shown in Table 13 below.

Table 13: Various Non-Economic Indicators of Quality of Life and Rankings for South Africa's Metropolitan Cities, 2004

City (Metropolitan government)	(1) HDI	(2) Own Index	(3) HDI Residuals	(4) Own Index Residuals	(5) Per Capita Income	Ranking by (3)	Ranking by (4)
City of Johannesburg	0.73	0.4464	-0.009	0.011	R 42 940	5	2
City of Tshwane (Greater Pretoria)	0.70	0.4229	-0.013	-0.007	R 35 582	6	6
Ekurhuleni Metropolitan (East Rand)	0.68	0.4324	-0.001	0.010	R 26 478	2	3
City of Cape Town	0.70	0.4369	0.023	0.015	R 25 547	1	1
eThekweni Metropolitan (Durban Unicity)	0.67	0.4163	-0.003	-0.005	R 24 184	3	5
Nelson Mandela Metropolitan (Port Elizabeth)	0.65	0.4225	-0.005	0.005	R 19 373	4	4

In Table 13 above, the HDI, this paper's own composite index of the non-economic quality of life (consisting of the proportion of old age persons in the population, literacy and equality) as well as the residual estimates from equation (2) for HDI and the own index are shown. As indicated, the residuals can be interpreted as non-economic quality of life indices that are independent of income, as well as indicators of the success with which the various

cities are converting economic quality of life into non-economic quality of life. In order to make easier comparisons, the various cities in Table 13 above have been ranked according to their per capita incomes. The final two columns in the table provide the ranking of the various cities in terms of the residuals from respectively HDI and the own index from equation (2). Thus, it can be seen from Table 13 that although Johannesburg was ranked 1st in 2004 in terms of economic quality of life (using per capita income), it was only ranked 5th in terms of the residuals from the HDI, and 2nd in terms of the residuals from the own index. The City of Tshwane (Pretoria) is likewise “underperforming” in terms of the non-economic quality of life as measured both by the residuals from the HDI and this paper’s own index. Specifically, Tshwane is ranked the worst (6th) according to both measures. In contrast, the City of Cape Town is ranked 1st in South Africa on both estimates of the non-economic quality of life, although in terms of per capita income it can only be ranked 4th in South Africa. Ekurhuleni (East Rand) and Durban’s performances seem to be on average: their per capita income ranking place them respectively in 3rd and 5th place, similar to their non-economic quality of life rankings.

Thus, from Table 13 above, it can be concluded that Pretoria and Johannesburg fare worst when it comes to non-economic quality of life, but best when it comes to the economic quality of life. They also tend to be less successful when it comes to translating economic quality of life into non-economic wellbeing. Cape Town, and to a lesser degree Nelson Mandela Metro (Port Elizabeth) fares better in terms of the non-economic quality of life. They are also coastal cities. In section above we also found that crime rates in South Africa’s cities were lowest in Cape Town and Nelson Mandela Metro, and that average climate and rainfall were also better in these cities than elsewhere. The conclusion is thus that as far as non-economic quality of life is concerned, the cities in South Africa that fares better are Cape Town and Nelson Mandela Metro. These are cities that fall in the middle and bottom respectively as far as per capita income of cities in South Africa is concerned. The cities with a relatively lower non-economic quality of life in South Africa are Tshwane (Pretoria), with one of the highest levels of per capita income, and Durban. The next section also shows that the environmental achievement of these two cities is lowest in South Africa.

7.4 *Economic Quality of Life and Environmental Quality*

In the previous sections it was established that the economic quality of life in South Africa’s cities are correlated with the usual measures of the non-economic quality of life such as the HDI and other measures such as equality, life expectancy and literacy. However, using finer methods to determine the non-economic quality of life independent of income, and estimating the extent to which economic quality of life was translated into non-economic quality of life, it was established that there is less of a tight relationship. Some cities, such as Tshwane, were found for instance to perform much worse in terms of its non-economic quality of life than its per capita income would predict.

In these non-economic indicators (HDI and this paper’s own indicator) the focus was on health and educational outcomes. It is however, increasingly acknowledged that the quality of the environment is also an important component of the quality of life. In section it was pointed out that a coastal location is often preferred by households due to its environmental qualities (see also Rappaport and Sachs, 2003). In section 5 a number of indicators of the environmental quality in South Africa’s six metropolitan cities were discussed. This section explores the relationship between per capita income and these environmental indicators.

Table 14 below contains the pairwise correlation coefficient between per capita income and a number of environmental indicators across South Africa's cities. The correlation coefficients in Table 14 below were calculated using data from all the magisterial districts (totalling 36 places) within a particular city, and not just the six cities alone.

Table 14: Correlation coefficients between per capita income and environmental quality across South Africa's cities in 2004

Measure	Correlation with per capita income
Percentage of land covered by forest and water	-0.175 (0.24)
Percentage of degraded land	-0.3698 (0.044)*
Percentage of land covered by urban residential buildings	0.3014 (0.0101)*
Average Annual Rainfall	0.0088 (0.9463)
Number of vehicles per population	0.3023 (0.1420)

Standard deviations in brackets

*A * indicates significance at the 5% level or better*

Table 14 above shows that there exist a negative relationship between land degradation and per capita income in South Africa's metropolitan city areas. This suggests that in South Africa's metropolitan areas, the poor tend to live in and around the more degraded land. The current analysis does not indicate the causality, i.e. whether raising incomes would improve the quality of land in an area (and vice versa) or whether higher incomes would lead to greater mobility of households who would migrate out of environmentally degraded areas into less degraded areas.

Table 14 above also shows that there exists a positive relationship between urban residential build-up land and per capita income. Although correlation does not imply causality, this could be indicative of the fact that higher income households tend to demand more buildings and amenities for residential use than poorer households. Thus, Table 14 above suggests that the urban poor in South Africa tend to reside in areas where the natural environment is more degraded and less supplied with built residential land than where the more affluent reside.

In Table 14 above forest and water bodies are negatively correlated with per capita income and rainfall positively correlated, but these relationships are not statistically significant.

The methodology used in the previous section can also be used to determine whether a city's environmental status, as measured by the percentage of degraded land, is higher or lower than would be predicted by its economic development (as reflected in per capita income). Thus, equation (2) was estimated using as dependent variable the proportion of degraded land in a city, and as explanatory variable per capita income. The residuals from this equation were saved and interpreted as an indicator of the environmental performance of a city. For instance, if the residual has a negative value, it indicates that its actual environmental status is better than its per capita income levels would have predicted. If it has a positive value, it indicates that the environmental status is worse than its per capita income levels would have predicted.

Table 15 below contains the aggregate results as far as the six metropolitan cities are concerned.

Table 15: Index of Environmental Achievement, South Africa's Metropolitan Cities, 2004

City (Metropolitan government)	Per Capita Income	% Degraded Land	Degraded Land Residual	Ranking
Nelson Mandela Metropolitan (Port Elizabeth)	R 19 373	0.24%	-0.05	1
Ekurhuleni Metropolitan (East Rand)	R 26 478	0.00%	-0.05	2
City of Johannesburg	R 42 940	0.00%	-0.01	3
City of Cape Town	R 25 547	0.00%	0.00	4
eThekweni Metropolitan (Durban Unicity)	R 24 184	3.55%	0.02	5
City of Tshwane (Greater Pretoria)	R 35 582	0.00%	0.02	6

Table 15 above shows that as far as the environmental achievement of the various cities are concerned, Nelson Mandela Metro (Port Elizabeth) and Ekurhuleni (East Rand) and Johannesburg fares the best, all have less degraded land given their per capita income. The City of Cape Town's environmental achievement is consistent with its per capita income, whilst eThekweni (Durban) and Tshwane (Pretoria) has more degraded land than is to be expected from their levels of per capita incomes.

8. Quality of Life over Time

Since 1994 there have been great expectations that the newly elected democratic government would address the quality of life of South African citizens. Based on the 1996 and 2001 Censuses conducted by Statistics South Africa, it is clear that there have been mixed improvements in the overall quality of life as measured by objectives indicators such as those discussed in this paper. For instance, although economic growth was positive and even in excess of 4% p.a. in some cities between 1996 and 2001, average wages per worker declined in most cities. Unemployment and inequality in South Africa's cities also increased. On the other hand, there is recognition that service delivery, especially access to housing, water and sanitation and electricity, increased notably over the past decade. This, as well as greater access to health and education to the poor, has resulted in measures such as the HDI increasing consistently since 1996.

Table 16 below contains a selection of economic and non-economic indicators of the quality of life in South Africa's cities for 1996 and 2001.

Table : Selected Economic and Non-Economic Indicators of the Quality of Life in South Africa's Metropolitan Cities, 1996 – 2001.

City (Metropolitan government)	Per Capita Income		HDI		Gini-Coefficient		Unemployment	
	1996	2001	1996	2001	1996	2001	1996	2001
City of Johannesburg	29912	37654	0.70	0.72	0.60	0.60	27.6%	30.9%
City of Tshwane (Greater Pretoria)	24622	31132	0.66	0.70	0.57	0.60	26.6%	29.7%
Ekurhuleni Metropolitan (East Rand)	21719	22259	0.65	0.67	0.57	0.58	32.2%	38.1%
City of Cape Town	23958	24947	0.69	0.70	0.54	0.58	19.5%	25.0%
eThekweni Metropolitan (Durban Unicity)	18723	21304	0.63	0.67	0.56	0.60	32.9%	37.8%
Nelson Mandela Metropolitan (Port Elizabeth)	15797	18683	0.63	0.66	0.55	0.57	36.3%	42.8%

From the Table 16 can be seen that per capita incomes, HDI has improved over time, but that inequality and unemployment has worsened. It is also noticeable that although the improvements or worsening of indicators are consistently so over the various cities, some cities have done better (or worse) than others. For instance, per capita incomes increased most sharply in Tshwane and Johannesburg (respectively by 26% and 25% over the period), whilst unemployment increased most sharply in Nelson Mandela Metro and Ekurhuleni (respectively by 6.5% and 5.9%). These differential performances of the various cities would have resulted in differences in their overall rankings in terms of quality of life.

The three tables to below summarizes the relative position of the various metropolitan cities with respect to non-economic and economic measures of the quality of life, over the period 1996 to 2004.

Table 17: Rankings by Economic Quality of Life (Using per capita income)

City	Rank 1996	Rank 2001	Rank 2004
Johannesburg	1	1	1
Tshwane	2	2	2
Cape Town	3	3	4
Ekurhuleni	4	4	3
eThekweni (Durban)	5	5	5
Nelson Mandela Metro (Port Elizabeth)	6	6	6

Table 18: Rankings by Non-Economic Quality of Life (Using Residuals from HDI)

City	Rank 1996	Rank 2001	Rank 2004
Johannesburg	2	6	5
Tshwane	5	5	6
Cape Town	1	1	1
Ekurhuleni	4	4	2
eThekweni (Durban)	6	2	3
Nelson Mandela Metro (Port Elizabeth)	3	3	4

Table 19: Rankings by Non-Economic Quality of Life (Using Residuals from an Own Index)

City	Rank 1996	Rank 2001	Rank 2004
Johannesburg	3	4	2
Tshwane	5	6	6
Cape Town	1	1	1
Ekurhuleni	4	3	3
eThekweni (Durban)	6	5	5
Nelson Mandela Metro (Port Elizabeth)	2	2	4

From the tables 17 to 19 it can be seen that as far as the economic quality of life is concerned, the various cities have roughly maintained their relative positions, with the exception of Ekurhuleni that has moved up one place, displacing Cape Town from 3rd position. As far as the non-economic quality of life indices are concerned, using the residuals from the HDI and this paper's Own Index regressions (see equation 2 and Table 19) it is noticeable that Cape Town has maintained its 1st position in both rankings, but that the relative position of the various cities depend on the index. For instance, as far as success in turning economic quality of life into non-economic wellbeing as measured by the HDI, Johannesburg has declined from 2nd position in 1996 to 5th position in 2004, Tshwane has declined from 5th to 6th position and Durban and Ekurhuleni has improved their positions on the ranking.

As far as success in turning economic quality of life into non-economic wellbeing as measured by an index of aged population, literacy and equality is concerned, Johannesburg has improved its position from 3rd place to 2nd, Ekurhuleni from 3rd to 4th, Durban from 6th to 5th, whilst Nelson Mandela Metro's position declined from 2nd to 4th place.

9. Summary and conclusions

The quality of life is a significant field of study, both from society and a policymaking perspective. The multi-dimensional nature of human wellbeing does however make it difficult to compile measures or indices of the quality of life. This paper considered the quality of life in South Africa's metropolitan cities, firstly because the South African population is rapidly urbanising and the quality of life is increasingly dependent on what the cities can offer. Also, according to Møller (2004), "*South Africa serves as a social laboratory for studying quality of life in developing countries. It is a nation characterised by varying levels of development, vast income inequalities, and cultural diversity in terms of language, religion, ethnicity and settlement patterns. It is this rich mix that lends itself*

to experimenting with the development of concepts and instruments to adequately capture the essence of quality of life and its measurement.”

This paper considered economic and non-economic indicators of the quality of life as well as indicators of the quantity of life. The relationship between the different indicators was also explored, specifically the relationship between the human development index and per capita income. However, per capita income is a component in the compilation of the HDI and this result in a strong positive relationship between the two indicators. To control for this an own indicator of the quality of life was constructed using life expectancy, literacy and the Gini-coefficient and used in regression analysis to calculate residual estimates of the non-economic quality of life. Economic quality of life was also compared with the environmental quality of South Africa's cities. In section 8 changes in the quality of life over time were examined.

The paper finds are that the measure of quality of life matters. When economic quality of life measures are used, specifically per capita income, the ranking in 2004 was Johannesburg, Tshwane, Ekurhuleni, Cape Town, eThekweni (Durban) and the Nelson Mandela Metro (Port Elizabeth). The country's largest agglomeration and its manufacturing base deliver the highest per capita income. However, when not only income is considered the coastal cities tend to offer a higher quality of life on margin, although cities located in the interior such as Johannesburg and Ekurhuleni have been found to have started to catch-up with coastal cities in terms of quality of life. When residuals from HDI are used as a measure of non-economic quality of life (i.e. the proportion of HDI not explained by variation in incomes), coastal cities tend to obtain generally higher rankings, with Cape Town ranked first, followed by Ekurhuleni, eThekweni (Durban), the Nelson Mandela Metro (Port Elizabeth) and then Johannesburg and Tshwane. An own composite index of non-economic quality of life constructed in this paper obtained a similar ranking, but with the major difference of finding that Johannesburg ranks in second place behind Cape Town.

Finally, the findings reported in this paper suggests South African cities play an important role in improving human quality of life in South Africa and that concerns that rapid urbanisation over the past decade would have had a detrimental effect on the quality of life is generally unfounded. Not only are average incomes in cities much higher than in rural areas in South Africa, there is generally been an improvement in the non-economic quality of life in the various cities.

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