Abstract

Many economies in Africa now find themselves in the unprecedented situation where they can look back to a relatively long period of a more sustained and faster growth over the last decade. They are also witnessing important policy renewal processes in many sectors. However, the positive growth is yet to translate quickly into significant poverty reduction due to deep-rooted problems such as high unemployment, stark inequality and structural barriers. In the case of South Africa, income inequality remains high and this has translated into social dimensions of inequality such as education, health and land ownership, which at the same time remain structural constraints to economic growth and development of the country.

The main thrust of this study is to develop a deeper understanding of the dynamics and drivers of economic and social inequalities in South Africa. The study provides a comprehensive report that specifically explores the dynamics and drivers of economic and social inequalities across the nine provinces of South Africa. The study also presents the challenges and policy options required to address social and economic inequalities in South Africa.

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The study treats economic inequality as the pattern of income distribution existing within the society while social inequality represents non-income distribution such as access to education, healthcare, and land use. The dynamics of the economic and social inequalities are assessed using the Statistics South Africa Household Survey in deriving the various distributions of the inequalities (Lorenz curves) and the Gini Coefficients for each province in the country over a set period of time where data is available. On the other hand, the drivers of the inequalities are assessed by carrying out an econometric investigation of the macro, institutional and structural factors in the country.

Preface
Following a long period of apartheid, which ended with the introduction of democracy in 1994, South Africa has been facing social and economic inequalities. Today, South Africa remains one of the most unequal countries in the world.

One must be concerned with inequality in South Africa for two reasons. First, inequality matters for both poverty and growth. Increased inequality for a given level of average income, education, health or land ownership will almost always lead to higher levels of both absolute and relative deprivations in these dimensions, and lower average growth rates. Second, inequality matters in what it stands for, the relative well-being of various groups in a society. Inequalities between clearly defined groups (for example, according to ethnicity) can pose national security problem in forms of social unrest, riots, crime, violent conflict and public disturbances. A perceived sense of inequality is a common ingredient of rebellion in societies.

The UNDP Country Office in South Africa commissioned this study to help broaden access to analytical work and empirical investigation on the dynamics and drivers of economic and social inequalities in South Africa. This report serves as an important tool of policy renewal process in several dimensions of human development (health, education, income and land ownership) by raising the quality of the policy debates on policy options to address the drivers of economic and social inequalities across the nine provinces of South Africa.

This report is intended to help the national government of South Africa, the provincial governments in South Africa, citizens, civil society organisations and policy makers to understand the extent of inequalities and to develop coherent policy responses to the drivers of economic and social inequalities in South Africa.

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1. Introduction and Background

The South African economy continues to face the triple challenge of high levels of poverty, unemployment and inequality. Persistently high levels of unemployment and inequality in an economy could lead to poverty trap. Also, many developing economies are characterised with high level of inequality and this has remained the subject of intense debate among policy makers and academics. In fact, seven of the ten most unequal countries in the world are in Africa.

Although the Millennium Development Goal (MDG) of halving poverty in the world has been met even before the set date, but accompanying this positive development is the rising level of inequality in the society and especially in developing economies (UNDP, 2013). Evidence of inequality in the society is more susceptible to trigger social violence and damage the existing social cohesions than poverty. Inequality reduction remains a crucial issue for the global economy to resolve in the next decade. For the developing economies where inequality is rising, this may be the manifestation of the predicted Kuznets (1955) and Solow (1956). According to Kuznets, economic growth in poor countries would initially lead to greater inequality which would later decline as the economy continues to develop, while Solow’s prediction indicated that poor countries would tend to grow faster and eventually converge with the developed countries through factor equalisation.

Empirical literature has confirmed that a higher and sustainable inclusive economic growth will translate into more employment generation and eventually poverty reduction in the society. But higher growth may not be enough to eradicate extreme poverty level in the economy. However, the distribution of growth also matters in achieving a substantial reduction in poverty level. Equal access to or ownership of factors of production will determine the pattern and extent of the distribution of income and wealth in the society.
The poverty-growth-inequality triangle established in Bourguignon (2003) suggested that in as much as the elimination of absolute poverty is important, it is also necessary to have country-specific combinations of growth and distribution policies. The level of inequality remains a major factor that drives poverty in an economy. Empirical literature has decomposed changes in poverty into a growth component and redistribution component (Ravallion and Datt, 1991; Ravallion and Chen, 1997; Adams Jr and Page, 2003; Adams Jr, 2004). Over the past decade, the Millennium Development Goal (MDG) of reducing poverty has focused more on achieving higher and sustained economic growth and neglecting the equally important factor of how the generated income should be distributed within the economy. While poverty has fallen across the regions over the past decades (due to rising income), inequality has increased, dampening the impact of growth on poverty reduction (Balarkrishnan et al. 2013). This trend indicates that the rising economic growth of the past decades has not been inclusive enough and therefore, a more inclusive/pro-poor economic policy is needed to eradicate relative poverty in the world (Saad-Filho, 2010). In this milieu, a shift in policy paradigm is needed. Government policies towards growing the economy should be inclusive with more weight attached to the distributional effects of their policy actions. Therefore, this study tends to support and or guide government policies towards achieving inclusive-economic growth and development.

Many other aspects of the economy have been linked to having major effects on inequality. In exploring the relationships that exist between financial development, globalisation, and government expenditure and taxation, and level of inequality, empirical evidence has shown mixed results since the causality strongly depends on the structure of the economy (Roine et al, 2009; Winter et al, 2004; Cline, 1997; Atkinson, 2000; Classens and Perotti, 2005; Greenwood and Jovanovic, 1990; Piketty, 2007; Gersbach and Schmutzler, 2007). Examining the causal relationship between inequality and a number of macroeconomic variables altogether, Heshmati (2004) found that income inequality is declining over time but there are
significant regional differences in the levels of development. However, his Kuznets hypothesis represents a
global U-shape relationship between inequality and growth.

Income inequality remains high in South Africa and this has translated into social dimensions of inequality
such as education, health and land ownership, which at the same time remain structural constraints to
economic growth and development of the country. Empirical literature specific to South Africa that has
carried out econometric investigation on the drivers of inequality remains very limited. Bhorat and Van der
Westhuizen (2012) carried out a thorough and critical analysis of poverty, inequality and the nature of
economic growth in South Africa. Their analysis suggests that, even though absolute and relative poverty
have fallen in the post-Apartheid era, income inequality in South Africa remains one of the highest in the
world and these disparities are most visible across the racial groupings in the country. The nature of the
economic growth as suggested by Bhorat and Van der Westhuizen is that which has mostly benefited the
top-end of income distribution in the country. However, their analysis is not subjected to empirical
investigation of determining the drivers of inequality. Kerr and Teal (2012) investigated the determinants
of earnings inequality using the Kwazulu-Natal province income dynamics study data for South Africa.
Their results suggest that human capital and individual ability explain much of the earnings differentials
within the private sector but cannot explain the large premiums for public sector workers. Empirical
evidence related to health inequality is found in Ataguba et al. (2011) when investigating the
socioeconomic-related health inequality in South Africa using general household surveys of self-reported
illness and disability indices to assess distribution of health in the country. Their findings reveal a huge
inequality in the health system in terms of access to and use of health facilities.

On the empirical front, very few studies have examined the structural and institutional factors that could
determine the level of inequality. Levels of governance and physical infrastructure have been identified as
major drivers of both social and economic inequalities (UNDP, 2013). However, one of the distinctive
features of this study is to test the significance of these factors on inequality. At the same time, most empirical evidence on inequality has been tailored towards examining the dynamics of income inequality while neglecting social inequality in the society.

Against this background, this study examines the dynamics and drivers of economic and social inequalities across the nine provinces of South Africa. Economic inequality refers to the pattern of income distribution existing within the society while social inequality represents non-income distribution such as access to education, healthcare, and land use. The dynamics of the economic and social inequalities are assessed using the Statistics South Africa Household Survey in deriving the various distributions of the inequalities (Lorenz curves) and the Gini Coefficients for each and every province in the country over a set period of time where data is available. On the other hand, the drivers of the inequalities are assessed by carrying out an econometric investigation of the macro, institutional and structural factors.

Following this introduction, section 2 of the report provides some stylised facts analysis of the dynamics of social and economic inequalities in South Africa. Section 3 describes the data analysis for the study and explores the empirical investigation of the drivers of social and economic inequalities in South Africa. Section 4 concludes with policy recommendations.

2. Dynamics of Social and Economic Inequalities in South Africa – Stylised Facts Analysis

The distribution of a country’s economic resources is vital in achieving the major national development objectives. In the context of achieving an overall economic development, income distribution may not be sufficient. Further step to access the dynamics of non-income distribution is necessary to unpack the mysteries behind inequality within and among the society. In this section, the dynamics of economic (income) and social (non-income) inequality in South Africa is thoroughly analysed. Economic inequality refers to the pattern of income distribution existing within the society while social inequality represents
non-income distribution such as access to education, healthcare, and land both at the national and nine (9) provincial levels of South Africa.

2.1. Income Inequality

Using the Lorenz curves (presented in Appendix A; Figure A1) derived from the households income distribution survey\(^2\), the dynamics of income inequality could be thoroughly analysed both at the national and provincial levels. Generally, over the years, income distribution in South Africa and across the provinces has been pro-rich (skewed towards higher income brackets) resulting in an average Gini index of about 0.72.

In 1999, about 60% of the household population only earned about 10% of national income and the next 20% of household population earned an additional 20% of national income while the remaining 70% of national income is held by the top 20% of household population. The distribution worsened in 2005 with about 60% of the population only earning about 8% of national income. The next 20% of the household population earned an additional 14% (cumulative 22%) of national income and the remaining 78% (cumulative 100%) of total income is held by the top 20% of household population. Income distribution improved slightly towards the year 2012 but only benefited the lower-middle income group while the bottom income group continues to worsen. During 2012, about 60% of the household population only earned about 5% of national income and the next 20% (cumulative 80%) of household population earned an additional 20% (cumulative 25%) of national income while the remaining 75% (cumulative 100%) of national income is held by the top 20% of household population.

Similar trend as discussed above is also reflected in the provincial income distribution (see Appendix A; Figure A1). In the Western Cape and Gauteng provinces, better income distributions are recorded over the

\(^2\) See Data Analysis Section for detail description and analysis of the data used in this study.
years. About 60% of the household population in the Western Cape earned about 30%, 20% and 10% of total income in 1999, 2005 and 2012 respectively. The distribution improved slightly for the lower-middle income group in 2012 as the next 20% (cumulative 80%) of the household population earned an additional 40% (cumulative 50%) of total income in the province from an additional 20% and 15% of total income in 1999 and 2005 respectively. Income distribution remains highly skewed towards the rich in 2012 with the top 20% of the population still holding on to about half of the total income. Similar trend is also recorded for Gauteng province except that distribution of income for the low and low-middle income groups has not changed since 2005.

In the Eastern Cape, majority of the household population (cumulative 80%) still hold on to about 10% of total income in the province and this trend has not changed since 1999. However, 20% of the household population seems to be earning about 90% of total income in the province. This is an indication that the provincial wealth is still concentrated in the hand of few members of the society. Looking at the Northern Cape province, in 1999, about 60% of the household population earns 10% of total income in the province. This trend deteriorates to about 4% of total income by 2012. With continued worsening of the distribution of income in 2012, cumulative 80% of the household population only earns about 20% of provincial income from about 30% in 1999.

Between 1999 and 2005, slight changes in the Free State provincial income distribution were recorded. The distribution of income in 1999 is similar to the trend recorded at the national level. In 2012, about 60% of the household population only earned about 3% of the provincial income and the next 20% (cumulative 80%) of household population earned an additional 10% (cumulative 13%) of provincial income while the remaining 87% (cumulative 100%) of provincial income is held by the top 20% of household population. Similar trend of income distribution is also recorded for Kwazulu-Natal province.
Income distribution did not change for the top 10% of the household population in the North West province but worsened for the bottom 80% between 1999 and 2005. During this period, a cumulative 80% of the population earns only about 20% of the provincial income. By the year 2012, the distribution worsened further for the bottom 80% of the household population as they only earn about 10% of the provincial income while the remaining 90% of income is held by only 20% of the population. With regards to Mpumalanga province, about 60% of the household population in 1999 earned about 10% of the provincial income and the next 20% (cumulative 80%) of household population earned an additional 10% (cumulative 20%) of provincial income while the remaining 80% (cumulative 100%) of provincial income is held by the top 20% of household population. The distribution also worsened towards 2005 with about 20% of the population holding on to about 90% of the provincial income. Towards the year 2012 a redistribution of income occurred with about 60% of the household population earning about 4% of provincial income and the next 20% (cumulative 80%) of household population earning an additional 14% (cumulative 18%) of provincial income while the remaining 82% (cumulative 100%) of provincial income is held by the top 20% of household population.

The Limpopo province recorded the worst income distribution in the country just after the Eastern Cape. Income distribution has worsened especially for the low and lower-middle income groups since 1999. For instance, in 2012, a cumulative 80% of the household population only earns about 5% of the provincial income down from about 14% in 1999. This indicates that about 95% of the provincial income is being held by only 20% of the population.

Looking at the racial factor in income inequality, Figure 1 presents the disparities in income distribution by racial classification. However, the inequality in income distribution among the racial groupings in South Africa reflects the severity of the social problems embedded within the society. As at 2012, majority of South African households (69%) belongs to the low income bracket (earning ≤R6,000 per month), about
14% to the lower-middle income bracket (>R6,000 but ≤R12,000 per month), about 6% to the upper-middle income bracket (>R12,000 but ≤R18,000 per month) and 11% to the high income bracket (≥R18,000).

**Figure 1: South Africa Income Distribution by Racial Classification – 2012**

Among the black/African population, income distribution remains skewed towards low income bracket with about 77% of the household population belonging to the low income bracket while only about 6% belongs to the high income bracket and the remaining population falling within the middle income bracket. Black households remain the most vulnerable to the scourge of inequality in the country. Following this trend is the Coloured population. About 58% of the Coloured population belongs to the low income bracket and about 13% to the high income bracket. The Indian-Asian population group seems to have a relatively even distribution of income. Households belonging to the low income bracket are about 29% of the population while those in high income bracket stand at about 34%.

On the other hand, the white household population reflects the rich in the society as about 56% of the population belongs to the high income bracket while the remaining household population belongs to the
low, lower-middle and upper-middle income bracket recordings at about 16%, 15% and 14% of the population respectively.

Source: Statistics South Africa and Authors’ Calculations

Deriving the Gini (income) index from the Lorenz curves, similar trend with different magnitudes is recorded over the years 1999 to 2012 (Figure 2). The Gini index measures the level of inequality within a particular society. It ranges from 0 to 1 with 0 representing perfect equality, and 1 representing perfect inequality in the society. Generally across all the nine provinces in South Africa, the level of inequality rises steadily reaching its peak in 2005 and declines subtly through to 2008 and thereafter it remains relatively unchanged. Despite the slight decline between 2005 and 2008, inequality in the country remains relatively high in comparison with other developing and developed economies. As at 2012, the Gini index at the

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3 See data analysis for detail explanation and derivation of the Gini index.
national level stand at about 0.7, confirming that income distribution remains concentrated towards the rich in the society.

Across the provinces, Gauteng and the Western Cape are the best performers in terms of income inequality as they stand below the national average and recording about 0.56 and 0.55 Gini indices respectively in 2012. Limpopo and Eastern Cape are the worst performers with about 0.84 and 0.82 Gini indices. Although Mpumalanga province remains above the national average but it seems to be performing better than Northern Cape, Free State and North West especially in the post-2008 period.

1.1. Education Inequality

The education sector of South Africa has been performing poorly in terms of delivery over the past decades despite the huge amount of funds being expended on the sector. About 20% of the country’s budget goes to education and yet little outcomes have been recorded over the years. There is a huge disparity between the quality of public and private education system in the country especially at the basic education level. Therefore, only the middle- to high-income earners can access the private education where quality delivery is present. This setback has caused major hindrances for many South Africans to proceed to higher educational institutions (i.e. universities).

Given the background above, the dynamics in education distribution is thoroughly analysed and is regarded as one of the measures of social inequality in the society. However, we measure the distribution of education services using an outcome-based approach. The distribution of education will be better measured and have greater impact on the economy if the completion rate at each particular educational
level is used. Using school completion rates at particular level, the Lorenz curves presented in Appendix A; Figure A2 are derived for the overall economy and nine provinces of South Africa.\(^4\)

Generally, the distribution of education in terms of qualification attainments remains very poor across the country. This trend remains very similar across all provinces in South Africa especially at the basic education level and did not change only until post-2000 but recording a worse distribution thereafter. This is an indication that the poor delivery of education services is more or less the same across all the provinces. With the exception of Gauteng and Western Cape provinces which perform better at the higher education levels, all other provinces in the country clustered around the mean values with only marginal differences.

At the national level, about 25% of the population have no education (no schooling) and about 5% (cumulative 30%) of the population can only boast of having completed a Grade 1 and this trend seems not to have changed since 1995. In the year 2000, only about 11% (cumulative 94.5%) of the population have a completed Matric (high school) certificate, about 3.5% (cumulative 98%) of the population have a post-high school certificate (i.e Diploma, NTC certificate) and about 2% (cumulative 100%) of the population have equivalent of a Bachelor and higher (including Masters’ and PhD) degrees. In 2005, this distribution worsened especially for basic education (between Grade 5 and Grade 11) but the percentage of the population completing high school improved slightly to 13% (cumulative 93.4%). About 4.6% (cumulative 98%) of the population have a post-high school certificate while the population with Bachelor and higher degrees remain at 2%. The trend further deteriorates at the basic education level towards the year 2012 but improvement is recorded for percentage of the population who have high school certificate. As at

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\(^4\) More detail discussion on the derivation of Lorenz curves for education can be found in the Data Analysis Section.
2012, about 16% (cumulative 90%) of the population have a completed high school certificate,\textsuperscript{5} about 7% (cumulative 97.5%) of the population have a post-high school certificate including higher Diploma certificate and about 2.5% (cumulative 100%) of the population have equivalent of a Bachelor and higher degrees.\textsuperscript{6}

The national distribution of education attainments discussed above remains similar for most of the provinces (Eastern Cape, Northern Cape, Free State, KwaZulu-Natal, North West, Mpumalanga and Limpopo) but with marginal differences. Exceptions to this scenario are the Gauteng and Western Cape provinces with better distribution of education attainments. In both provinces since 1995, about 15% of the population have no education (no schooling) and about 4% (cumulative 19%) of the population can only boast of having completed a Grade 1. In the Gauteng province, about 20% (cumulative 91%) of the population in the year 2000 have a completed high school certificate, about 5% (cumulative 96%) of the population have a post-high school certificate and about 4% (cumulative 100%) of the population have equivalent of a Bachelor and higher degrees.

In 2005, the percentage of the population completing high school remain the same at 20% (cumulative 89%) and about 7% (cumulative 96%) of the population have a post-high school certificate while the population with Bachelor and higher degrees remain at 4%. As at 2012, about 22% (cumulative 84%) of the population in Gauteng have a completed high school certificate, about 11% (cumulative 95%) of the population have a post-high school certificate including higher Diploma certificate and about 5% (cumulative 100%) of the population have equivalent of a Bachelor and higher degrees. With regards to the Western Cape province about 14% (cumulative 91%) of the population in the year 2000 have a completed high school certificate, about 5% (cumulative 96%) of the population have a post-high school certificate.

\textsuperscript{5} The improvement in the high school certificates can be attributed to the adjustment (lowering of pass mark) made to the pass marks by the Department of Education.

\textsuperscript{6} It is important to note that these figures include foreign nationals who came to study in the country. This will be more applicable at the higher (Masters’ and PhD) degrees level.
and about 4% (cumulative 100%) of the population have equivalent of a Bachelor and higher degrees. In 2005, the percentage of the population completing high school improved to 16% (cumulative 91%) and about 6% (cumulative 97%) of the population have a post-high school certificate while the population with Bachelor and higher degrees declines to 3%. Towards the year 2012, about 18% (cumulative 87%) of the population in Western Cape have a completed high school certificate, about 9% (cumulative 96%) of the population have a post-high school certificate including higher Diploma certificate and about 4% (cumulative 100%) of the population have equivalent of a Bachelor and higher degrees.

Looking at the racial factor in education inequality, Figure 3 presents the disparities in education distribution by racial classification. However, the inequality in education distribution among the racial groupings in South Africa is very severe. As at 2012, majority of South Africans (about 74%) have either no schooling or could not complete high school.

**Figure 3: South Africa Education Distribution by Racial Classification –2012**

Source: Statistics South Africa and Authors’ Calculations
Among the Black/African population, education attainment remains skewed towards not having been able to complete high school. However, about 61% of the population have completed between Grade 1 and Grade 11 but only about 15% holds the high school certificate. The population with no schooling among the blacks stand at 18% and those with Diploma/Certificate and Bachelor & higher degrees stand at 4.5% and 1.5% respectively. Similar to this trend is the Coloured population. The poor performance of education attainment also reflects the high dropout rates that exist among these two population groups. This can be depicted from the divergence between completion of Grade 1 to 11 and the completion of Grade 12 (high school).

In addition, majority of those that even completed high school do not proceed further to a higher degree. The Indian-Asian population group seems to have performed much better than the Black and Coloured groups in terms of education attainments. Population with high school certificate stand at about 32% while those with Diploma, Bachelor & higher degrees summed up to about 16%. However, the white population remains the most educated group in the society as about 37% of the population have either no schooling (7%) or could not complete high school (30%) while the remaining holds a high school, Diploma/Certificate and Bachelor & higher certificates recording about 32%, 18% and 13% of the population respectively.

Figure 4: Total Economy and Provincial Gini (Education) Index 1995-2012
Figure 4 presents the Gini (education) index from the Lorenz curves derived in the Appendix. Again, similar trend with different magnitudes is recorded over the year 1995 to 2012. Generally, across all the nine provinces in South Africa, the level of education inequality rises steadily especially since 2003. Except for Gauteng and Western Cape, education inequality in the rest of the provinces is clustered around the same mean and slightly above the national average. Education inequality in the country as of 2012 remains relatively high and on a rising trend, surpassing the income inequality at the national level. As at 2012, the Gini education index at the national level stands at about 0.71, confirming that highest education attainment remains concentrated towards the few in the society. Across the provinces, Gauteng and the Western Cape are the best performers in terms of education inequality as they stand below the national average and recording about 0.61 and 0.65 Gini education indices respectively in 2012. Limpopo, North West, Northern Cape and Eastern Cape provinces are the worst performers converging to a high of about 0.77 Gini education index.
1.1. Health Inequality

The dynamics of the healthcare distribution in South Africa is still not totally inclusive. Although public healthcare is free for the citizens but not accessible to majority of South Africans and where accessible poor quality healthcare is being provided. The health sector has been characterised as fragmented and inequitable given the huge disparity that exists between public and private healthcare deliveries. The new intended National Health Insurance Scheme (NHIS) is targeted to bridge this gap and provide all South Africans with equal access to quality healthcare facilities.

In South Africa, it is difficult to select an indicator for the health measurement of the entire population. The Statistics South Africa tends to use child mortality as a proxy to measure health of the entire population. Although the anthropometric indicators are reputed to serve as a proxy to measure health and the quality of life for an entire population, this study has adopted access to medical insurance per household as a measure of health distribution services in South Africa (Omilola, 2010). This measure will reflect to a large extent the coverage of quality healthcare system. The number of household members that could be provided with health insurance in a particular household reflects the level of accessibility to quality healthcare facilities in that society.\(^7\)

From the Lorenz curves distribution presented in Appendix A; Figure A3, access to quality healthcare facilities remains highly unequal in the South African economy. In addition, the trend and distribution of health insurance for households remain similar across all the nine provinces especially at the lower-end where households struggle to provide health insurance for at least one member. Thereafter, the distribution slightly differs among the provinces. Between 2009 and 2012 where data is available, distribution of healthcare coverage remains unchanged across all the provinces.

\(^7\) According to Statistics South Africa’s General Household Survey of 2012, on average, there are about four (4) members in a particular household in the country.
In the overall economy, about 75% of the household population could only provide health insurance to at most one member of the household. This trend worsens to over 80% in the Eastern Cape, Free State, Kwazulu-Natal, North West, Mpumalanga and Limpopo provinces. This is lower in the Gauteng province with about 69% of household population who could provide health insurance to at most one member of the household. The Western Cape province remains the best performer with about 64% of household population who could meet up with the health insurance need of at most one person in the family. The next 24% (cumulative 99%) of household population in the overall economy can provide health insurance to at most 6 members of the household while the remaining 1% (cumulative 100%) can provide for more than 6 members. Similar trend but slight variation in distributions is recorded for all the provinces in this aspect.

Looking at the racial factor in health inequality, Figure 5 presents the disparities in health insurance distribution by racial classification. Again, the inequality in healthcare distribution among the racial groupings in South Africa remains very severe and following similar trend in comparison with income and education inequality. However, about 76% of South African households can only afford to provide health insurance to at most one member of the household, 14% of household population can provide for at most three members while 10% of the household can cover at most six or more members of the household.

**Figure 5: South Africa Healthcare Insurance Distribution by Racial Classification –2012**
Among the Black/African population, health insurance coverage remains tilted towards not having been able to cover more than one household member. About 85% of Black/African households can only afford to provide health insurance to at most one member of the household, 9% of household population can provide for at most three members while 6% of the household can cover at most six or more members of the household. The Coloured population seems to have a better access to healthcare insurance than the Black population. Households who could cover at most three and six of household members stand at about 14% and 15% respectively while about 70% of the household population can only be able to provide health insurance for at most one member of the household. The Indian-Asian population group have a relatively even distribution of healthcare coverage. Households covering at most one member are about 49% of the Indian-Asian household population while those covering at most three members of household stand at about 22%. The households who can cover six or more members record a high of about 29% sum together. Again, the white population have the most access to healthcare insurance facilities in the society as about 69% of the household population can either provide health insurance to at most one member (20%) or to
at most three members (49%) of household while the remaining households (31%) population can afford to cover the health insurance needs of up to six or more members of the households.

**Figure 6: Total Economy and Provincial Gini (Health) Index 2009-2012**

![Graph showing Gini (health) index from 2009 to 2012 for different provinces.]

Source: Statistics South Africa and Authors’ Calculations

Figure 6 presents the Gini (health) index from the Lorenz curves derived in the Appendix. Generally, across all the nine provinces in South Africa, the level of health inequality dropped between 2009 and 2010 and rises again between 2010 and 2011. Thereafter, health Gini index has been relatively stable except for Gauteng and Northern Cape provinces that recorded a decline during the period 2011 and 2012. Despite these variations, health inequality in the country remains relatively high. As at 2012, the Gini health index at the national level stands at about 0.8, confirming that quality healthcare distribution remain highly inaccessible to majority of South Africans. Across the provinces, Gauteng and the Western Cape again, are the best performers in terms of health inequality as they stand below the national average and recording about 0.75 Gini health index each in 2012. Limpopo and Eastern Cape also remain the worst performers with about 0.85 and 0.84 Gini health indices.

### 2.2. Land Inequality
Land (a factor of production) plays a crucial role in any economy and therefore, its even distribution among the citizens will ensure efficiency in the production process. Land distribution remains one of the most debatable socio-economic issues in South Africa. The legacy of the Apartheid era continues to hinder the equal distribution of land ownerships in the country. However, land ownership remains in the hands of minorities in the society and this has been creating a huge social threat which could dampen the development of the country.

Given this background, this study adopted the accessibility to land per household as a measure of land distribution in the country. This distribution reflects the land size for which each and every household in the country have access to for production purposes. From the Lorenz curves distribution presented in Appendix A; Figure A4, access to land remains highly unequal in the South African economy. Both the trend and distribution of land per households differ across all the nine provinces. Generally, over the years since 2002 where data is available, land distribution in South Africa and across the provinces stand at an average Gini index of about 0.73.\(^8\)

In 2002, a cumulative 84\% of the household population can only access about 10\% of the country’s land and the next 12\% (cumulative 96\%) of household population holds an additional 64\% (cumulative 74\%) of country’s land while the remaining 36\% (cumulative 100\%) of country’s land is held by the top 4\% of household population. The distribution changed slightly in 2005 with about 78\% of the population only owning a cumulative 10\% of the country’s land. The next 19\% of the household population owns an additional 75\% (cumulative 85\%) of the country’s land and the remaining 15\% (cumulative 100\%) of total land in the country is owned by the top 3\% of household population.

\(^8\) It is important to note the weaknesses of these data as discussed in Section 3.2 on data analysis.
Land distribution in the overall economy improved slightly towards the year 2012 but only benefited the small-holders of land while redistribution remains rigid with large-holders of land. During 2012, a cumulative 40% of the household population owns about 10% of the country’s land and the next 52% (cumulative 92%) of household population owned an additional 20% (cumulative 30%) of the country’s land while the remaining 70% (cumulative 100%) of the country’s land is held by 8% of household population.9

In the Western Cape a cumulative 44% of the household population owns about 10% of provincial land in 2002 and the next 16% (cumulative 60%) of household population holds an additional 30% (cumulative 40%) of provincial land while the remaining 60% (cumulative 100%) of provincial land is held by 40% of household population. The distribution worsened slightly in 2005 with about 44% of the population owning a cumulative 10% of provincial land. The next 16% (cumulative 60%) of the household population owns an additional 12% (cumulative 22%) of provincial land and the remaining 78% (cumulative 100%) of total land in the province is owned by 40% of household population. Land distribution in the province worsened towards the year 2012. As at 2012, a cumulative 30% of the household population owns about 10% of provincial land and the next 60% (cumulative 90%) of household population owned an additional 20% (cumulative 30%) of provincial land while the remaining 70% (cumulative 100%) of provincial land is held by 10% of household population.

The Eastern Cape Province as at 2002 recorded a highly unequal land distribution but this improves slightly towards 2012. In 2002, a cumulative 90% of the household population owns about 10% of provincial land and the next 9% (cumulative 99%) of household population holds an additional 80% (cumulative 90%) of provincial land while the remaining 10% (cumulative 100%) of provincial land is held by 1% of household population. In 2005, a cumulative 88% of the population owned a cumulative 10% of provincial land. The

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9 The major change in the distribution towards the year 2012 can be attributed to improvement in data collection (survey) methods in terms of population sample.
next 11% (cumulative 99%) of the household population owns an additional 84% (cumulative 94%) of provincial land and the remaining 6% (cumulative 100%) of total land in the province is owned by 1% of household population. Moving towards 2012, a cumulative 44% of the household population owns about 10% of provincial land and the next 36% (cumulative 80%) of household population owned an additional 10% (cumulative 20%) of provincial land while the remaining 80% (cumulative 100%) of provincial land is held by 20% of household population.

Huge disparities in land distribution exist in the Northern Cape especially between 2005 and 2012. In 2002, a cumulative 22% of the household population owns about 10% of provincial land and the next 38% (cumulative 60%) of household population holds an additional 25% (cumulative 35%) of provincial land while the remaining 65% (cumulative 100%) of provincial land is held by 40% of household population. In 2005, slight deviation from this trend occurred, with a cumulative 35% of the population owning a cumulative 10% of provincial land. The next 16% (cumulative 51%) of the household population owns an additional 25% (cumulative 35%) of provincial land and the remaining 65% (cumulative 100%) of total land in the province is owned by 39% of household population. The distribution worsened towards 2012 with a cumulative 70% of the household population owning about 10% of provincial land and the next 12% (cumulative 82%) of household population owned an additional 13% (cumulative 23%) of provincial land while the remaining 77% (cumulative 100%) of provincial land is held by 18% of household population.

In the Free State province, a cumulative 72% of the household population owns about 10% of provincial land in 2002 and the next 10% (cumulative 82%) of household population holds an additional 26% (cumulative 36%) of provincial land while the remaining 64% (cumulative 100%) of provincial land is held by 18% of household population. The distribution improved slightly towards 2005 with about 54% of the population owning a cumulative 10% of provincial land. The next 7% (cumulative 61%) of the household population owns an additional 9% (cumulative 19%) of provincial land and the remaining 81% (cumulative
100%) of total land in the province is owned by 39% of household population. As at 2012, the trend in the
distribution changes and a cumulative 32% of the household population owns about 10% of provincial land
and the next 63% (cumulative 95%) of household population owned an additional 20% (cumulative 30%) of
provincial land while the remaining 70% (cumulative 100%) of provincial land is held by 5% of household
population.

Land distribution in the Kwazulu-Natal province remains unchanged until 2005. As at 2005, a cumulative
84% of the household population owns about 10% of provincial land and the next 15% (cumulative 99%) of
household population holds an additional 81% (cumulative 91%) of provincial land while the remaining 9%
(cumulative 100%) of provincial land is held by 1% of household population. The distribution improved
slightly towards 2012 with about 58% of the population owning a cumulative 10% of provincial land. The
next 41% (cumulative 99%) of the household population owns an additional 80% (cumulative 90%) of
provincial land and the remaining 10% (cumulative 100%) of total land in the province is owned by 1% of
household population.

In the North West province, the cumulative percentage of the population using 10% of the provincial land
for production is about 61% in 2002. The next 17% (cumulative 78%) of the household population uses an
additional 20% (cumulative 30%) of the provincial land while the remaining 70% (cumulative 100%) of the
provincial land is used by 22% of the household population. This trend remains relatively unchanged up
until 2005. In 2012, a cumulative 87% of the household population holds about 10% of the provincial land
for production and the next 7% (cumulative 94%) of the household population holds an additional 14%
(cumulative 24%) of the provincial land while the remaining 76% (cumulative 100%) of the provincial land is
being used by only 6% of household population.

The distribution of land for production purposes in Gauteng is found to be erratic and unevenly distributed
up until 2005. A cumulative 50% of the household population in 2002 only have access to 2% of the
provincial land for production purposes. However, the next 30% (cumulative 80%) of the household population holds an additional 70% (cumulative 72%) of the provincial land while the remaining 28% (cumulative 100%) of the provincial land is held by 20% of the household population. Similar trend with slight improvement was recorded in 2005 with a cumulative 40% of the household population only having access to 2% of the provincial land. The next 20% (cumulative 60%) of the household population holds an additional 60% (cumulative 62%) of the provincial land while the remaining 38% (cumulative 100%) of the provincial land is held by 40% of the household population. As at 2012, this distribution differs greatly with a cumulative 60% of the household population holding about 10% of the provincial land for production and the next 30% (cumulative 90%) of the household population holds an additional 7% (cumulative 17%) of the provincial land while the remaining 83% (cumulative 100%) of the provincial land is being used by only 10% of household population.

In Mpumalanga province, a cumulative 62% of the household population owns about 10% of provincial land in 2002 and the next 25% (cumulative 87%) of household population holds an additional 53% (cumulative 63%) of provincial land while the remaining 37% (cumulative 100%) of provincial land is held by 13% of household population. The distribution worsened slightly in 2005 with about 78% of the household population owning a cumulative 10% of provincial land. The next 10% (cumulative 88%) of the household population owns an additional 59% (cumulative 69%) of provincial land and the remaining 31% (cumulative 100%) of total land in the province is owned by 12% of household population. As at 2012, a cumulative 36% of the household population owns about 10% of provincial land and the next 62% (cumulative 98%) of household population owned an additional 30% (cumulative 40%) of provincial land while the remaining 60% (cumulative 100%) of provincial land is held by 2% of household population.

In Limpopo province, a cumulative 78% of the household population owns about 10% of provincial land in 2002 and the next 20% (cumulative 98%) of household population holds an additional 83% (cumulative
93%) of provincial land while the remaining 7% (cumulative 100%) of provincial land is held by 2% of household population. The distribution improved slightly towards 2005 with about 70% of the population owning a cumulative 10% of provincial land. The next 29% (cumulative 99%) of the household population owns an additional 87% (cumulative 97%) of provincial land and the remaining 3% (cumulative 100%) of total land in the province is owned by 1% of household population. As at 2012, a cumulative 28% of the household population owns about 10% of provincial land and the next 71% (cumulative 99%) of household population owned an additional 72% (cumulative 82%) of provincial land while the remaining 8% (cumulative 100%) of provincial land is held by 1% of household population.

Looking at the racial factor in land inequality, Figure 7 presents the disparities in land-use distribution by racial classification. However, land size used for production purpose per household reflects the extent to which land is accessible to a particular population group. As at 2012, about 42% South African households have access to less than a hectare of land, 34% can access between 1 and 10 hectares of land and 24% can access more than 10 hectares of land for production purpose.
Among the four racial groups, the Indian-Asian are the most marginalised in actual terms. In relatively terms, the black population seems to be the most marginalised group given that over 70% of total population of South Africa is black/African. Almost all Indian/Asian population cannot access more than one hectare of land for production purpose. The distribution is better spread when it comes to Black/African population but still highly unequal in comparison with the White and Coloured groups. About 49% of Black households have access to less than a hectare of land, 37% can access between 1 and 10 hectares of land and 14% can access more than 10 hectares of land for production purpose. The White and Coloured population groups have the most access to land in the country with about 65% and 62% of the households respectively using more than 10 hectares of land for production purposes. White household using less than a hectare of land for production is about 12% while those using between 1 and 10 hectares rose to about 24%. On the other hand, Coloured households using less than a hectare of land for production is about 29% and those using between 1 and 10 hectares is about 9%. 

Source: Statistics South Africa and Authors’ Calculations
Figure 8: Total Economy and Provincial Gini (Land) Index 2002-2012

Panel A: Downward Trending Provinces

Panel B: Upward Trending Provinces

Source: Statistics South Africa and Authors’ Calculations

Figure 8 presents the Gini (land) indices from the Lorenz curves derived in the Appendix. As at 2012, the overall economy Gini (land) index is about 0.72 trending downward from 0.76 in 2002 (Panel A). Contributed to this downward trend are the Eastern Cape, Kwazulu-Natal and Limpopo provinces which have recorded a fall in Gini of about 10%, 3% and 7% respectively between 2002 and 2012. These provinces can also be regarded as the best performing provinces in terms of Gini (land) index. The worst performing provinces are reported in Panel B with upward trending Gini (land) index. Most of these provinces in Panel B are below the national average index pre-2008 before rising trend ensues. Mpumalanga province remain relatively stable with Gini (land) index increasing only by about 15% between 2002 and 2012 while the Northern Cape recorded more than 100% increase during the same period.

3. Drivers of Social and Economic Inequalities in South Africa –Empirical Investigation
The previous sections have analysed theoretical and empirical studies on inequality and have also revealed the dynamics of economic and social inequalities both at the national and provincial levels in South Africa. From the dynamic analysis, it is evident that income inequality in the South Africa is embedded in all the three categories of social inequality analysed. For instance, quality basic and higher education, quality healthcare facilities and access to land for production are all associated with the level of income. Therefore, it is expected that income inequality will be associated with social inequality (UNDP, 2013). Although, there are many empirical studies investigating the determinants of income inequality but there remain a dearth of empirical literature investigating the determinants of social inequality especially in the case of South Africa. However, using the derived inequality (Gini) index from the previous section, this study further investigates the factors driving both income and social inequalities in South Africa.
Theoretical Framework and Methodology

As mentioned earlier, one of the objectives of this study is to empirically estimate the drivers of economic and social inequalities in South Africa. Since inequality in general measures dispersion in a distribution, therefore, its determinants will be related to what determines the distribution. Many empirical studies (Roine et al, 2009; Winter et al, 2004; Cline, 1997; Classens and Perotti, 2005; Greenwood and Jovanovic, 1990; Piketty, 2007; Gersbach and Schmutzler, 2007) have investigated the macro determinants of inequality. In this study, we look at the macroeconomic, structural and institutional determinants of social and economic inequalities. Structural factors are likened to the level or stock of physical infrastructure while institutional factors are associated with the level of governance embedded in the system. Therefore, four distinct panel estimations were carried out to determine the factors responsible for inequality in the society. In line with existing empirical literature, a panel data econometric technique is used to estimate the determinants/drivers of economic and social inequalities in the nine provinces of South Africa over the period 1999-2012, 1995-2012, 2007-2012 and 2002-2012 (based on availability of data) for income, education, health and land inequality respectively. The econometric models are presented alongside their a priori sign below:

\[
\ln_{-}gini_{-}inc, = \beta_1 - \beta_2 \ln_{-}gdp_{-}pc, + \beta_3 \ln_{-}inv, + \beta_4 \ln_{-}open, + \beta_5 \ln_{-}credit, - \beta_6 \ln_{-}pii, - \beta_7 \ln_{-}gov, + \ln_{-}tax, + e, \quad (1)
\]

\[
\ln_{-}gini_{-}edu, = \beta_1 - \beta_2 \ln_{-}gdp_{-}pc, + \beta_3 \ln_{-}inv, + \beta_4 \ln_{-}open, + \beta_5 \ln_{-}credit, - \beta_6 \ln_{-}pii, - \beta_7 \ln_{-}gov, + \ln_{-}tax, + \ln_{-}gini_{-}inc, + e, \quad (2)
\]

\[
\ln_{-}gini_{-}hl, = \beta_1 - \beta_2 \ln_{-}gdp_{-}pc, + \beta_3 \ln_{-}inv, + \beta_4 \ln_{-}open, + \beta_5 \ln_{-}credit, - \beta_6 \ln_{-}pii, - \beta_7 \ln_{-}gov, + \ln_{-}tax, + \ln_{-}gini_{-}inc, + e, \quad (3)
\]

\[
\ln_{-}gini_{-}land, = \beta_1 - \beta_2 \ln_{-}gdp_{-}pc, + \beta_3 \ln_{-}inv, + \beta_4 \ln_{-}open, + \beta_5 \ln_{-}credit, - \beta_6 \ln_{-}pii, - \beta_7 \ln_{-}gov, + \ln_{-}tax, + \ln_{-}gini_{-}inc, + e, \quad (4)
\]
Where \( gini\_inc \) is the level of gini (income) index; \( gini\_edu \) is the level of gini (education) index; \( gini\_hlt \) is the level of gini (health) index; \( gini\_land \) is the level of gini (land) index; \( inv \) is the investment spending; \( gdp\_pc \) is the gross domestic product per capita; \( open \) is the level of openness (globalisation); \( credit \) is the level of financial inclusion/deepening; \( tax \) is the average tax rates; \( pii \) is the physical infrastructure index; \( gov \) is the level of governance index; \( e \) is the error term and the subscript \( (it) \) refers to country and time period respectively. All variables are presented in their natural logarithm (\( \ln_\) ) forms except for the governance index, which has negative values.

The gross domestic product (GDP) per capita is expected to pose a negative relationship with inequality, as evidenced in the literature. Therefore, an increase in GDP per capita should reduce the level of both income and non-income (social) inequality, given that the cause of the rising GDP is pro-poor otherwise a positive relationship may ensue. Similarly, the level of investment spending (public and private) is expected to have a negative relationship with inequality. An increasing capital formation in an economy prepares each and every members of the society equal participation in economic activity.

The rate of openness (globalisation) of an economy, the level of financial inclusion/deepening and tax rates are ambiguous in relation to the level of inequality. An open economy may reduce inequality if each and every member of the society or participants in the economy have equal access to take part in economic activity. But if only a selected few in the economy can only partake in international transactions, then openness is expected to increase the level of inequality. Also, equal access to finance or credit is expected to lead to reduction in inequality but when access is denied to some selected people in the society inequality tends to rise. Tax rates could lead to redistribution of income in the economy if tax revenue collected by government benefits the poor in the society. But this may not be the case with social inequality. A rising tax level may not be effective enough to grant equal access to quality education, quality
healthcare facilities and land especially in a mixed economy with huge structural constraints such as South Africa. Therefore, increasing tax level could lead to continuing social inequality.

The inclusion of physical infrastructure and governance variables is based on the premise that the existing poverty and inequality reduction strategies remain ineffective in most developing countries and especially in sub-Saharan Africa since they have not taken into consideration the socioeconomic and institutional factors that are embedded in the economy. These socioeconomic and institutional factors can be attributed to the level of physical infrastructure and governance existing in the economy (Akanbi, 2013). A widespread quality physical infrastructure and good governance structures will set a strong foundation for an overall inclusive economy where every individual can engage in any meaningful economic activity. Therefore, physical infrastructure and governance are expected to pose a negative relationship with inequality.

As discussed earlier, income inequality index is included as an additional explanatory variable to the three measures of social inequality. The income inequality is expected to pose a positive relationship with other social inequality (UNDP, 2013). Therefore, a reduction in income inequality should as well lead to reduction in the level of social inequality.

The specification of the models reveals a possible endogeneity problem among the regressors and this has rendered the use of ordinary least squares (OLS) inappropriate in the estimations. That is to say that the explanatory variables in the model could be determined by each other and hence can be correlated with the error term. In this scenario, an instrumental variables regression is appropriate to derive robust estimates of the parameters in Equations 1 to 4. Following similar step as in Akanbi (2013), a two-stage least squares (TSLS) estimation method is adopted and in order to correct for possible omitted variables and error-in-variables, suitable instruments that are assumed to be highly correlated with the observed explanatory variables and uncorrelated with the error term are used (Wooldridge, 2010:89-115). The
instruments used are one to two period lag of all the dependent and independent variables in the estimations.

In addition, province-specific characteristics were considered in the estimations under the assumption that although these provinces may have similar economic structures, there still exist major differences in their patterns of inequality. Time-specific characteristics could not be captured due to limited time period used. Given this, the study carried out the TSLS with one-way (cross-section-specific) fixed effect estimation techniques.

3.1. Data Description and Analysis

The data used in this study have been obtained from the Statistics South Africa, South African Reserve Bank, Quantec; EasyData, World Bank; World Databank, IMF; International Financial Statistics, and Worldwide Governance Indicators database. It covers the period between 1995 and 2012 among all nine (9) provinces in the country. Where necessary, all data are measured in local currency rands. The major limitation to this study is the nature of the data used. Data availability and weaknesses remain a major setback in carrying out this type of empirical research especially the survey data from Statistics South Africa employed in deriving the inequality variables. The following provides detailed explanation on how some variables used in the study were generated:

3.1.1. Deriving the Lorenz curves and Gini index

The study looks at social inequality in the framework of disparities in the distribution of human capital – access to education and quality healthcare facilities while economic inequality is as a result of unequal distribution of income in the society. Therefore, social inequality arises from the lack of wealth obtained from a particular segment of the society.
The dynamics of economic inequality is based on general household income distribution categorised as the percentage of the household population belonging to a particular income bracket in the nine provinces of South Africa.

On the other hand, the dynamics of social inequality are categorised based on the following:

a) **Health inequality** – percentage of household population that could provide health insurance cover to certain number of household members per provinces.

b) **Education inequality** – percentage of total population who has completed a particular level of education per provinces.

c) **Land inequality** – percentage of household population who have access to land for production purposes per provinces.

Given the above categories, Lorenz curves are derived for the nine (9) provinces in the country using the Statistics South Africa Household Survey. The Lorenz curves and Gini coefficient is calculated following Slack and Rodrigue (2009) and presented below:

\[
G = 1 - \sum_{i=0}^{z} (\sigma Y_{z-1} + \sigma Y_{z}) (\sigma X_{z-1} - \sigma X_{z})
\]

(5)

Where \( \sigma Y \) is the cumulative distribution of the income or social variables, for \( i=0,...,z \) with \( Y_{0}=0 \) and \( Y_{1}=1 \); and

\( \sigma X \) is the cumulative distribution of the population variable, for \( i=0,...,z \) with \( =0 \) and \( X_{1}=1 \).

The following are codes to access the data from Statistics South Africa: ‘Q413hect’ for land distribution, ‘Q16hiedu’ for education distribution, ‘onemed’ for healthcare insurance distribution and ‘totmhinc’ for income distribution.
The Gini coefficient is a ratio between 0 and 1, where 0 implies that each individual or household in the economy receives the same income or social capital and 1 imply that only one individual or household receives all the income and social capital (Benson, 1970).

Since the distribution in the household surveys changes frequently over a period of time, this creates volatility in the calculated annual Gini index. To reduce this noise between these years, a 5-year moving average for the Gini index is calculated using the initial year Gini index as the bases for the previous five years. This is based on the assumption that significant changes in inequality or other development issues will only be visible over the medium-term period (i.e. 5 years). This process is carried out for the entire inequality index except for health inequality (see Figures 2, 4, 6 and 8).

3.1.2. Measuring infrastructure

The measure of infrastructure is updated from Akanbi (2013) derived index which include South Africa. Infrastructure is represented by a composite Physical Infrastructure Index (PII), which is based on three infrastructure stocks of (i) roads, (ii) telecommunication, and (iii) electricity. Empirical literature on the link between infrastructure and economic development has been plagued by single-infrastructure stock (Calderón, 2009). To avoid this shortcoming, Calderón and Servén’s (2004) approach was adopted in building an aggregate index that combines the three infrastructure stocks. In addition, the aggregation of the infrastructure stocks will help to reduce the measurement error associated with a single-infrastructure indicator.

3.1.3. Measuring governance

To derive the Lorenz curves $\sigma Y$ is plotted against $\sigma X$ after specifying the line of equality. This is done for each and every year where data is available between 1995 and 2012 (See Appendix A).
The worldwide governance indicators developed by Kaufmann et al. (1999) were utilised in this study. The indices cover a broad range of policy and institutional outcomes for a large number of countries, and include the rule of law, corruption control, government effectiveness, regulatory quality, voice and accountability, and political instability. These indices are also employed in Globerman and Shapiro (2002) and Akanbi (2012) as a measure of governance.

Governance is captured in a broader context by taking the average value of the six elements in the governance indicators as a measure of governance. The governance indicators’ series is only available from 1996 onward, with missing values for 1997, 1999 and 2001. To circumvent this problem, an interpolation technique was adopted in order to fill in the missing data points.

3.1.4. Other variables

Other variables included in the specifications are real GDP per capita measured as the ratio of real GDP to population per province, investment spending is measured as the gross capital formation per province, openness/globalisation is measured as sum of exports and imports in relation to GDP per province, financial inclusion is measured as the ratio of broad money supply to GDP and tax rate is measured as the ratio of GDP to total tax revenue in the economy. The financial inclusion and tax rate variables use the aggregated (overall) values for all the provinces due to unavailability of disaggregated data for money supply and tax revenue.

1.1. Empirical Results

Based on the framework adopted above, this section presents the estimation results. As discussed earlier, four measures of inequality (income, education, health and land) are adopted in the study. Balanced panel estimations were carried out with different pooled observations after necessary adjustments have been made. After solving for all the possible estimation problems that could render the coefficients invalid, the
entire explanatory variables examined in all estimations were found to be statistically significant determinants of inequality except for some few instances like investment spending, financial inclusion, openness and physical infrastructure variables in the education, income and land inequality equation respectively. These variables explained significantly well the level of economic and social inequalities within the country (Table 1).

Table 1: Estimated coefficients for the determinants/drivers of Inequality

<table>
<thead>
<tr>
<th>Dependent variables: Gini Index</th>
<th>Independent variables</th>
<th>Income</th>
<th>Education</th>
<th>Health</th>
<th>Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP per capita</td>
<td>-0.23**</td>
<td>-0.35*</td>
<td>-1.07*</td>
<td>-0.86**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.75)</td>
<td>(-1.71)</td>
<td>(-2.10)</td>
<td>(-2.61)</td>
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<tr>
<td>Physical infrastructure index</td>
<td>-0.45***</td>
<td>-0.45***</td>
<td>-0.52*</td>
<td>-0.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-4.86)</td>
<td>(-2.92)</td>
<td>(-1.69)</td>
<td>(-0.88)</td>
<td></td>
</tr>
<tr>
<td>Governance</td>
<td>-0.33***</td>
<td>-0.38**</td>
<td>-2.42**</td>
<td>-0.40*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-5.15)</td>
<td>(-2.46)</td>
<td>(-2.60)</td>
<td>(-1.69)</td>
<td></td>
</tr>
<tr>
<td>Investment spending</td>
<td>-0.31***</td>
<td>-0.08</td>
<td>-0.22*</td>
<td>0.40**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-3.30)</td>
<td>(-0.94)</td>
<td>(-2.00)</td>
<td>(2.58)</td>
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</tr>
<tr>
<td>Openness</td>
<td>0.06 (1.76)</td>
<td>0.06**</td>
<td>0.02</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.73)</td>
<td>(1.03)</td>
<td>(1.39)</td>
<td></td>
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<tr>
<td>Financial inclusion</td>
<td>1.08***</td>
<td>0.02</td>
<td>-0.32*</td>
<td>-1.06***</td>
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</tr>
<tr>
<td></td>
<td>(9.18)</td>
<td>(0.17)</td>
<td>(-2.01)</td>
<td>(-5.00)</td>
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<tr>
<td>Tax rate</td>
<td>-0.48***</td>
<td>0.36*</td>
<td>0.92*</td>
<td>0.54*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-4.11)</td>
<td>(2.34)</td>
<td>(2.09)</td>
<td>(1.81)</td>
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</tr>
<tr>
<td>Income gini index</td>
<td>0.14* (1.91)</td>
<td>0.33***</td>
<td>0.38*</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>(3.85)</td>
<td>(2.06)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>4.96***</td>
<td>4.71**</td>
<td>15.52**</td>
<td>4.62</td>
<td></td>
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<tr>
<td></td>
<td>(3.43)</td>
<td>(1.80)</td>
<td>(2.16)</td>
<td>(1.45)</td>
<td></td>
</tr>
<tr>
<td>Number of observations</td>
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<td>144</td>
<td>54</td>
<td>90</td>
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<tr>
<td>R-square</td>
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<td>0.89</td>
<td>0.84</td>
<td>0.87</td>
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<tr>
<td>Durbin-Watson Statistic</td>
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<td>1.39</td>
<td>2.28</td>
<td>0.49</td>
<td></td>
</tr>
</tbody>
</table>

Note: *** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level. T-statistics are recorded in parenthesis ()..

Source: Authors’ Calculation from Eviews 8

The results show that an increase in GDP per capita by 1% will lead to decrease of about 0.23%, 0.35%, 1.1% and 0.86% in the level of income, education, health, and land inequality respectively. Rising per capita

12 It should be noted that in the case of a TSLS estimation, the coefficient of variations (R-square) presented are no more valid since we can no longer decompose the variation in inequality into different independent components (Wooldridge, 2010:89-115).
GDP seems to have a better redistributive tendency towards health and land inequality. This can be attributed to the strong welfare effect these types of inequality portray. Income and education inequality will decline by about 0.45% each when physical infrastructure improved by 1% and this will lead to about a 0.52% and 0.15% decline in the case of health and land inequality. In terms of governance, an improvement in the level of overall governance by a unit will respectively lead to about a 0.33%, 0.38%, 2.4% and 0.4% decline in the level of income, education, health, and land inequality (Table 1). The bigger magnitude governance exerted on health inequality can be attributed to the fact that the health sector could be seriously affected by allocative changes that favours corruption and other elements of bad governance.

Investment spending will not have any positive effect on land inequality if the very few in the society continue to hold the majority of the land, instead, land inequality will continue to rise by about 0.4% when investment spending increases by 1%. Since land remains a fixed and an inevitable factor of production, therefore, interest on any capital investment will continue to benefit the very few owners of land. On the other hand, an increase in investment spending by 1% will lead to decrease of about 0.31%, 0.1% and 0.22% in the levels of income, education and health inequality respectively.

The level of openness (globalisation) will have a negative impact on both economic and social inequalities but at low magnitudes. This trend is in line with the global evidence as reported in UNDP (2013) that globalisation processes have largely been responsible for the increasing income inequality in the developing world. But the economic impact of globalisation (0.06%, 0.06%, 0.02% and 0.08%) on income, education, health and land inequality reported in this study is found to be insignificant. This suggests that openness in the aspect of exchange of services is still at a low level in South Africa.

The level of financial inclusion in the country remains very low and has been exacerbating the levels of income and education inequality. When financial inclusion increases by 1% income inequality will rise by
about 1.1% while education inequality will only increase by about 0.02%. South Africa has one of the most sophisticated financial systems in sub-Saharan Africa but only very few percentage of the population have access to this system. Therefore, financial development turns out to be pro-rich and education attainments by individuals in the society have not been propelled by access to credits.

With regards to health and land inequality, the financial sector has been able to play a redistributive role over the years. The positive and significant impact the financial inclusion variable exert on health and land inequality can be attributed to the participatory role played by the financial sector in providing funds to the medical insurance companies and landed property markets to carry out their operations. However, an increase in financial inclusion by 1% will lead to decrease of about 0.32%, 1.1% in the level of health and land inequality respectively.

Average tax rate has a positive effect only on income inequality while other social inequalities are found to have negative impacts. When average tax rate increases by 1% income inequality will decline by about 0.5% since income will be redistributed from the top income percentile to the bottom income percentile in the society. On the other hand, this will lead to increasing level of social inequality as the tax increases will limit access to education facilities, healthcare facilities, and land usage within the country. On this note, an increase in tax rate by 1% will lead to an increase of about 0.36%, 0.92% and 0.54% in the levels of education, health and land inequality respectively.

Looking at the inclusion of the income inequality as an additional explanatory variable in the social inequality equations, the effects are in line with what is expected. A decline in income inequality will directly be translated into decline in education, health and land inequality. This indicates that equal distribution of income is a necessary first step (but not sufficient) in achieving strong social cohesion in the country. When the level of income inequality increases by 1%, education, health and land inequality will rise by about 0.14%, 0.33% and 0.38% respectively.
1.2. **Policy Implications: Identifying a ‘sustainable’ level of inequality**

To reduce both economic and social inequalities in a developing country such as South Africa, this study has estimated that higher and sustained income per capita, productive investment spending, an improved level of physical infrastructure and good governance are needed simultaneously.

The regressions above have clearly shown that increase in income (GDP per capita), and investment spending matter for reducing economic and social inequalities in South Africa. Government intervention through increases in taxation will only help in reducing income inequality but will not directly translate into equal access to education, health and land. Although towards the long-run, the indirect effects of taxation via income inequality impact on social inequality will be positive since the reduction of social inequality also requires an improvement in income inequality. The financial inclusion and globalisation (openness) have led in most cases to rising economic and social inequalities. On the other hand, governance and physical infrastructure matter for reducing the level of inequality.

Given this, thresholds for economic (income) and social inequality are derived as functions of per capita income. However, given the dearth of empirical relevance of the impact of governance (institutions) and physical infrastructure (structural impediments) on inequality, this study takes a further step to derive thresholds for economic and social inequalities as a function of these two variables.\(^\text{13}\)

The thresholds presented in Figure 9 revealed that rising per capita income alone is not enough in eradicating inequality especially with income inequality.\(^\text{14}\) This is an indication that the trend in per capita income is partially reflected in the distribution of income in the society. In other word, rising income per person does not necessarily translate into equal distribution across all spectrum of the society. Income

\(^\text{13}\) The computed inequality index from the estimation results is about 0.72, 0.65, 0.75 and 0.53 for income, education, health and land measures respectively (based on the mean of the pooled sample of all provinces). The computed inequality index is very close to the actual values from the mean of the pooled sample.

\(^\text{14}\) The scale of the per capita income broadened to a high of $60,000 for better comparison with high income countries.
inequality will remain at 0.73 when average income per capita in the economy is about $3,000 per annum. This will fall to about 0.62 Gini (income) index point as income per capita rises to $6,000 per annum. Between $6,000 and $15,000 per capita income, income inequality will only decline to about 0.5 index points. This slowdown in the decline rate of inequality continues as average per capita income increases and starting from about $36,000 onward changes in income inequality remain relatively unchanged. This reveals an important fact that per capita income may matter in reducing income inequality (when all other factors remain the unchanged) but only to a certain extent when inequality in the society will remain unchanged. Similar trend is also found for the social inequality index but at lower levels than income inequality. Rising income per capital seems to be very effective with health and land inequality as their respective inequality index will fall to about 0.1 when average annual income per capita is about $30,000. At this point, education and income inequality will stand at 0.31 and 0.43 index points respectively.¹⁵/¹⁶

Figure 9: Per capita income and inequality levels

The thresholds for economic and social inequality in relation to GDP per capita (Figure 9) are obtained by controlling for average investment spending levels, infrastructure index, financial inclusion, openness, governance, tax rate and where necessary income equality. A similar procedure was carried out in Figure 10 by controlling for average GDP per capita, investment spending, financial inclusion, openness, tax rate and where necessary income equality. This is based on the mean of the pooled sample of selected provinces. In addition, the obtained thresholds also controlled for all other unobserved variables in the estimations which is captured through the error term.
Given the governance scores which range from -2.5 to 2.5 and in order to categorise governance at different levels, the range between -2.5 and -1 corresponds to ‘poor governance’, between -1 and +0.5 corresponds to ‘average governance’ and between +0.5 and +2.5 corresponds to ‘good governance’.17

Following the approach used in Akanbi (2013), the physical infrastructure index derived for the South African economy ranges from 0.6 to 1.25. However, Calderón and Servén’s (2010) derivation which incorporates other regions such as India and the East Asia Pacific (EAP) found a range between -1.5 and +2. Both India and the EAP have been regarded as having an average infrastructure stock based on the World Economic Forum (WEF) rankings on quality of infrastructure. WEF rankings range from 1 to 7, with 1 being the worst (i.e. Haiti) and 7 the best (i.e. Switzerland) in infrastructure quality. To capture the lowest performers (underdeveloped region) and best performers (developed region) in infrastructure stock, the scale is broadened and rearranged to align with the WEF rankings. Therefore, physical infrastructure as defined in the study ranges from -2.5 to +6.5. To also categorise the physical infrastructure index at different levels, the range between -2.5 and 0 corresponds to ‘poor’ infrastructure, between 0 and +3 corresponds to ‘average’ infrastructure and between +3 and +6.5 corresponds to ‘good’ infrastructure.

It is also interesting to detect further if per capita income matters in achieving perfect equality in the society. Therefore, for a given average GDP per capita ranging from US$2,000 to US$8,000 (Figure 10 A-H), provinces with poor governance and poor infrastructure ratings will sustain a higher level of inequality while those with good governance and good infrastructure ratings will be able to sustain a lower inequality level. In general, per capita income seems to matter in achieving lower inequality especially at poor governance and poor infrastructure ratings but inequality tends to converge in some cases when good infrastructure ratings are established.

17 Similar idea was adopted in Kraay and Nehru (2006) when categorising weak, medium, and strong policy using the CPIA.
Figure 10: Governance, infrastructure ratings and inequality levels

Panel A

Panel B

Panel C

Panel D

Panel E

Panel F
Source: Authors’ Calculation and Analysis of Data
From Figure 10, operating at a higher level of GDP per capita will bring about a lower inequality level. In relation to income and education inequality, governance and physical infrastructure in Panels A to D, there seems to be an existence of convergence in inequality as physical infrastructure improves but diverges as governance improves. In other words, irrespective of the level of GDP per capita, income and education inequality tend to converge at a lower level as good infrastructure are attained but at different levels when good governance is pursued. This means that per capita income matters in reducing income and education inequality through enforcement of good governance but as good physical infrastructure is being established lower inequality can be achieved irrespective of the level of per capita income.

The distinctive difference between Panels A/C & B/D (operating from the baseline scenario) is the fact that for inequality to start declining, a province must have achieved at least an average governance rating while at a poor infrastructure rating declining inequality could resume as physical infrastructure improves. That is to say that higher level of inequality is feasible even when a province is standing at a good governance rating. In addition, given the baseline GDP per capita level, the income and education inequality index will fall from 1 to 0.3 as better governance is being pursued while this will fall from 1 to 0.03 with improved infrastructure (Panels A to D).

In relation to health inequality, governance and physical infrastructure in Panels E and F, there seems to be an existence of convergence in inequality as governance and infrastructure improve. Irrespective of the level of GDP, poverty levels tend to converge at their lowest as good governance and physical infrastructure are attained. Again, the distinctive difference between Panels E and F is that for inequality to start declining, a province must achieved at least a good governance rating and thereafter inequality will response steeply to a small change in governance. Whereas declining inequality will resume as physical infrastructure improves from poor to good ratings. With the baseline GDP per capita level, the health
inequality index will fall from 1 to 0.01 as better governance is being pursued while this will fall from 1 to 0.02 with improved infrastructure (Panels E and F).

With regard to land inequality, governance and physical infrastructure in Panels G and H, convergence could not be achieved; instead inequality seems to remain at different levels as GDP differs. This indicates that for land redistribution to be effective across the country rising level of income per capita is needed. Provinces with higher levels of GDP per capita will continue to reduce land inequality at a lower rate even when infrastructure improvements and better governance are the same as others.

In contrast to income, education and health inequality in Panels A to F, inequality will start declining from a poor to a good governance and infrastructure ratings. In addition, lower levels of land inequality can be achieved with the poorest physical infrastructure ratings if and only if higher level of income per capita can be attained. With the baseline GDP per capita level, the land inequality index will fall from 1 to 0.23 as better governance is being pursued while this will fall from 0.8 to 0.21 with improved infrastructure (Panels G and H).


This study has empirically examined the dynamics and drivers of economic and social inequalities in the South African economy, which could also be applicable to other regions of the world. The dynamics of both economic and social inequalities have highlighted both the categories and provinces in South Africa with the most unequal distribution. Social inequality among South Africans has been found to be more severe than economic inequality since the unequal distribution of income and wealth within the society will restrain more citizens in accessing healthcare and educational facilities and land use. On the other hand, provinces where economic activities are low have been experiencing more severe level of inequality.
With regards to assessing the drivers of economic and social inequalities, the analysis is carried out on a panel of nine (9) South African provinces mostly covering the period 1995 to 2012. Due to the endogeneity problem that could exist among the regressors, the study resolved to use the two-stage least squares (TSLS) fixed effect estimation techniques. The estimations performed (after controlling for other factors) portray a robust estimate of the parameters in the inequality equations.

It is found that the macroeconomic variables (trade liberalisation, financial development, investment spending and taxation) play an important role in both social and economic inequalities. But this will not be enough to achieve the desirable distribution of income and social inclusion if majority of the population still lacks basic physical infrastructure or are still being governed poorly. However, augmenting the estimations with these two variables has provided a more robust and significant parameter estimates. To quantify these effects, a given level of inequality is derived in relation to a particular level of per capita income, physical infrastructure rating, and governance rating after controlling for and averaging out other explanatory variables in the model. For instance, a particular province operating at a given level of infrastructure will be at a particular level of inequality or Gini index. Therefore, as infrastructure improves after controlling for all other factors, inequality declines. This could be useful for policy directions and targets.

The main findings of the study have revealed that:

- Income inequality remains very high with an estimated 0.72 average Gini index recorded for the overall economy over the period 1999-2012. The Lorenz curve distribution revealed that only very few percentage of the population received the largest portion of national income. About 60% of the household population only earned about 10% of national income while 20% of the household population takes about 70% of the national income. The econometric specification of the determinants of income inequality reveal that higher
tax rates, more investment spending, better physical infrastructure and good governance will redistribute income within the society and provinces more than rising per capita income itself.

- Education inequality recorded for the overall economy is at an estimated 0.73 average Gini index in 2012 from 0.56 index point in 1995. The Lorenz curve distribution revealed that only about 1.5% of the population have attained at least a bachelor’s degree as at 2012 and this trend has not changed since 1995. The trend shows that apart from the financial constraints, the poor quality of the basic education is a major hindrance in accessing higher degree qualifications. The econometric specification of the determinants of education inequality reveal that better physical infrastructure and good governance will redistribute education (human capital) within the society and provinces more than rising per capita income itself.

- Health inequality remains very high with an estimated 0.79 average Gini index recorded for the overall economy. The Lorenz curve distribution revealed that only very few percentage (20%) of the household population can provide health insurance coverage for more than one member of a household. Access to quality healthcare facilities remain very restricted. The econometric specification of the determinants of health inequality reveal that rising level of per capita income will eventually create equality in the health system. Likewise, better physical infrastructure and good governance will redistribute healthcare equally within the society and provinces.

- Land inequality recorded for the overall economy is at an estimated 0.74 average Gini index. The Lorenz curve revealed a very highly skewed distribution with only very few percentage of the population having access to land for production purposes. As at 2012, a cumulative 40% of the household population owns about 10% of the country’s land while only 8% of population holds about 70% of the land. The econometric specification of the determinants of land inequality reveal that rising level of per capita income and good governance will eventually redistribute land equally within the society and provinces.

- The high levels of inequality in income, education, health, and land distribution among the racial groupings in South Africa reflect the severity of the social problems embedded within the society. Black households
(which take more than 70% of the total population) remain the most vulnerable to the scourge of economic and social inequalities in the country while the white household population (minority group) reflects the rich in the society. Gauteng and Western Cape provinces remain the best performing provinces in the country in terms of both economic and social distribution of resources while the Limpopo and Eastern Cape are the worst performing provinces.

- Other than per capita income, investment spending, trade liberalisation, financial inclusion and taxation, the level of governance and physical infrastructure are also significant determinants of economic and social inequalities in the country. Therefore, inequality-reducing strategies should focus more on structural and institutional impediments but without undermining the macroeconomic factors.

- Rising income per capita either through smaller household’s population or higher productivity levels will lead to much lower social inequality than economic inequality. There exists a convergence in health inequality levels as better governance and infrastructure improvement are pursued even when per capita income levels differ across provinces. This also occurs in income and education inequality but only when there is improvement in physical infrastructure. Other than this, income per capita really matters in reducing economic and social inequalities.

**Policy directions:**

Good governance and increased investment in physical infrastructure should be pursued religiously. A more stable socioeconomic and political environment, corrupt-free society, an effective public service, good regulatory environment, and a transparent leadership structure should rule over all other economic objectives. An equally distributed quality physical infrastructure across all the provinces in the country will create conducive environment for private agents or investors to locate their investments at any part of the economy without fear of infrastructure constraints.
Investment in education is a crucial element to the development of South Africa. The quality of basic education (especially the public educational institutions) needs an urgent revamp. To address the inadequate skills lacking in the economy a strong educational foundation is needed. However, since the appropriate skills to drive the economy to its full potential level is lacking, it is appropriate for government to import or attract skills from abroad and set-up a medium- to long-term skill transfer mechanism within the system for the South African citizens. To revamp the quality of basic education, there is an urgent need to import qualified trained teachers especially in the areas of science and mathematics that will impact the appropriate knowledge and skills that the economy needs. In addition, an estimate for particular number skills that is needed per sector or field of specialisation is needed as a guide to know where government efforts to boost skills level should be targeted.

Education can also be used as a tool for redistributing land in the country. Government should create a medium- to long-term mentorship/apprenticeship programme to facilitate the transfer of land ownership for agricultural production. Farmers training programmes should be established at every level of educational attainments where theoretical skills will be impacted. With the completion of these training programmes each and every prospective farmer should be posted to the located farms where he/she will receive a practical training under trained and experienced farmers and alongside this, the trainee will begin to own a percentage of the land and its produce. This will also depends on the period of time spent on a particular farm. However, this will require a strong political and societal will.

Moreover, boosting skills levels through quality education, pursuing good governance by putting in place the appropriate structures and creating equal distribution of physical infrastructure will increase the pool of entrepreneurship and eventually lead to declining income inequality and equal access to healthcare services in the country.
References


Roine, J., Vlachos, J. and Waldenstrom, D. 2009. The long-run determinants of inequality: what can we learn from top income data? Available at:


Appendix A

Figure A1: Total Economy and Provincial Lorenz Curves – Based on Income Distribution

<table>
<thead>
<tr>
<th>Total Economy</th>
<th>Western Cape</th>
<th>Eastern Cape</th>
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<tbody>
<tr>
<td>Northern Cape</td>
<td>Free State</td>
<td>Kwazulu-Natal</td>
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</table>

![Total Economy Lorenz Curve](image1)

![Western Cape Lorenz Curve](image2)

![Eastern Cape Lorenz Curve](image3)

Legend:
- 1999
- 2005
- 2012
North West  |  Gauteng  |  Mpumalanga
Limpopo

Figure A2: Total Economy and Provincial Lorenz Curves – Based on Education Distribution
North West  |  Gauteng  |  Mpumalanga
Limpopo
Figure A3: Total Economy and Provincial Lorenz Curves – Based on Health Distribution

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<td>Kwazulu-Natal</td>
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[Graphs showing Lorenz curves for Total Economy and Provincial regions, comparing data from 2009 to 2012.]
North West  
Gauteng  
Mpumalanga
Figure A4: Total Economy and Provincial Lorenz Curves – Based on Land Distribution

<table>
<thead>
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<th>Eastern Cape</th>
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<tbody>
<tr>
<td>Northern Cape</td>
<td>Free State</td>
<td>Kwazulu-Natal</td>
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Graphs showing the cumulative distribution of land and population across different provinces and years (2002, 2005, 2012) for Total Economy and Western Cape and Eastern Cape.
<table>
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<th>North West</th>
<th>Gauteng</th>
<th>Mpumalanga</th>
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![Graphs showing cumulative % of land vs cumulative % of population for North West, Gauteng, and Mpumalanga for years 2002, 2005, and 2012.](image-url)
Limpopo