From "*Pro-Poor*" to "*inclusive*" growth: Gauging Northern Cape growth performance

DEPARTMENT OF ECONOMIC DEVELOPMENT AND TOURISM

NORTHERN CAPE PROVINCE

Contents

1. Introduction

The United Nations University (UNU), purported that poverty can be reduced through economic growth and improvements in income distribution. For decades, growth has remained the main target whereas redistribution has been largely neglected under the conception that the benefits of growth would trickle-down from top to bottom of the income ladder. Growth is, however, a necessary but not a sufficient condition for poverty reduction. Moreover, inequality-expanding distributional shifts erode and often cancel out the impact that average income increases could have on the extent of poverty. This is why the mainstream development economics debate has been slowly moving into focusing on shared growth or pro-poor growth, and, more recently, inclusive growth. This can only be achieved if the pace of inclusive and sustainable economic growth in the country can be accelerated. The Premier of the Northern Cape has maintained that the province should strive to have an inclusive growth; which will translate into inclusive yet tangible economic development for the people of the Northern Cape. In comparison, the Northern Cape constitutes a rather small contribution towards the National economy, said to be around 2.2 %(2013(IHS figures)).

The province has experienced robust economic growth, growing at around 1.63% post-crisis. Despite the robust growth, poverty levels have remained stubbornly high. Thus a strong need to quell poverty. Scholars on Development insists that poverty reduction depends on two factors. The ***first factor*** is the magnitude of economic growth rate; the larger the growth rate, the greater the poverty reduction. Whilst the ***second factor*** relates to the distribution of benefits of growth; if the benefits of growth go more to the poor than to the non-poor, then the poverty reduction will be at a larger-scale. This implies that the policy of maximizing growth alone will not necessarily lead to a maximum reduction in poverty. Development Practitioners have sought to measure growth and whether it's inclusive or rather exclusive. Thus this economic intelligence report focuses on the four thematic growth inequality and poverty correlation measures (i.e. Poverty Bias of Growth (PBG), Poverty Growth Index (PGI), Poverty Equivalent Growth Rate (PEGR) and the Growth Elasticity of Poverty (GEP)). Then, the report transcends to the inclusivity measure, i.e. Inclusiveness Index developed by the International Policy Centre (IPC) for Inclusive Growth, as proposed by Fourie (2014).

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Thus the report will culminate in the computation and thus the evaluation of the Northern Cape economy in terms of its inclusiveness. However what does it mean, inclusiveness or inclusive growth? Making reference to the pioneering work of Ramos et al (2013), Inclusive growth is both an ***outcome*** and a ***process***. On the one hand, inclusive growth ensures that everyone participates meaningfully in the growth process and direction. That is, both in terms of decision-making for organising the growth progression as well as in participating in growth itself (that is earning income). On the other hand, inclusiveness goes some way towards ensuring that everyone equitably shares the benefits of sustained economic growth. In summing their notion on inclusive growth, Ramos et al (2013), insist that it implies participation and equitable benefit sharing.

Participation without benefit sharing will make growth unjust and sharing benefits without participation will make it a welfare outcome.

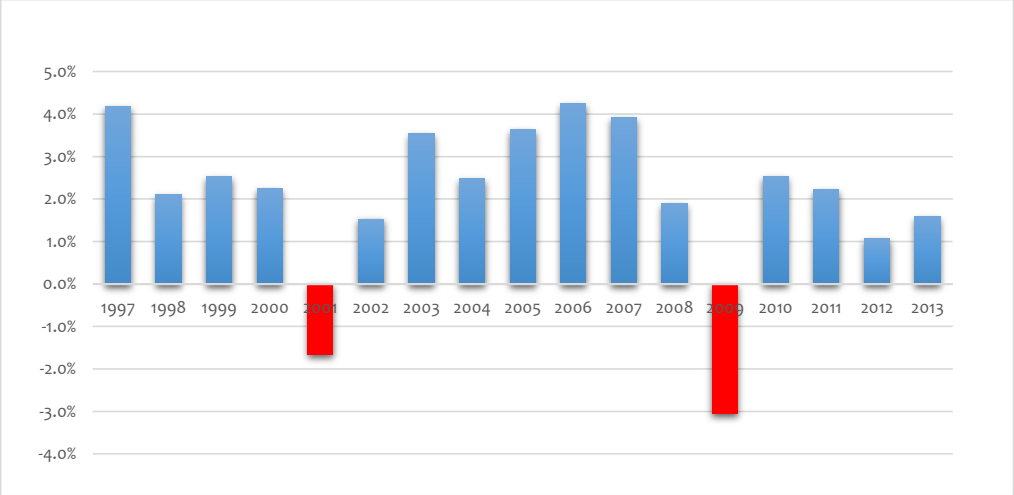
2. The Socio-Economic dynamism of the Northern Cape

The section that follows herein, attempts to paint a picture of the socio-economic landscape of the Northern Cape Province. With focus resting in on the key variables/measures that would be utilised to calibrate provincial inclusive growth index. The Northern Cape is a mecca of paradoxes, said to be the most sparsely populated province in the country, whilst on the other hand being the biggest in terms of landmass.

2.1 Northern Cape Economic Performance

Northern Cape GDP-R has circumnavigated through the 2009 financial crisis, when it grew at a negative 3 percent, to consistently grow, at an averaged 1.8 percent post-crisis. Noteworthy, is the fact that the current provincial economic performance is in stark contrast to the performance during pre-crisis. When it grew at an averaged 3.3 percent, i.e. during 2004 until 2008.

Figure 1. GDP-R Total Growth

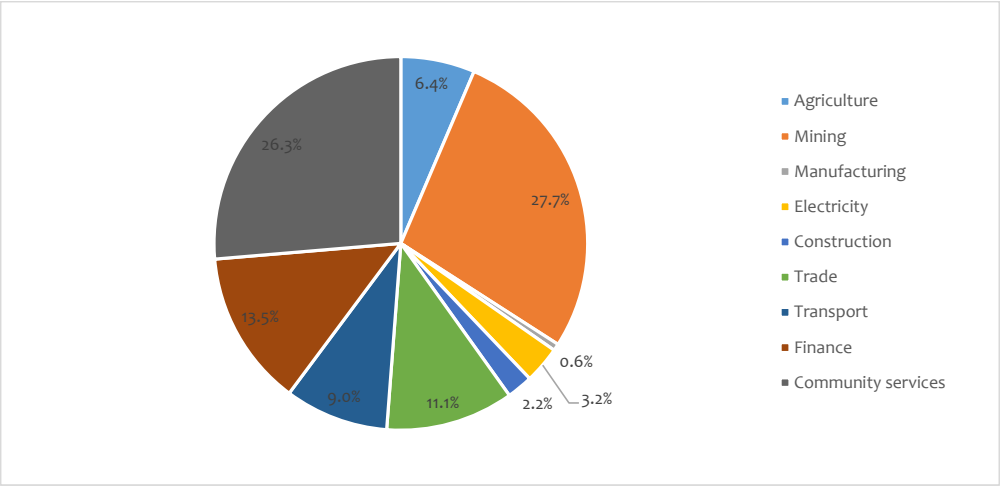


Source: IHS Global Insight Regional explorer version 745

Development Economics scholars suggest that economic structure is a term that describes the changing balance of output, trade, incomes and employment drawn from different economic sectors – ranging from primary to secondary to tertiary and quaternary sectors. It is known that the Northern Cape is characterised by a concentration of economic activity in the urban area and dominated by Tertiary[1] (60%) and Primary (34%) sectors. The economy of the Northern Cape continues to dependent heavily on the primary sector and as such Mining and Agriculture remain critical sectors of the economy.

[1] The Primary sector is made up of Agriculture and Mining, whereas the Secondary sector constitutes Manufacturing, Electricity and Construction. Meanwhile the Tertiary sector is premised on the following; Trade, Transport, Finance and the Community Services sector.

Figure 2: Northern Cape Economic Structure – 2013



Source: IHS Global Insight Regional explorer version 745

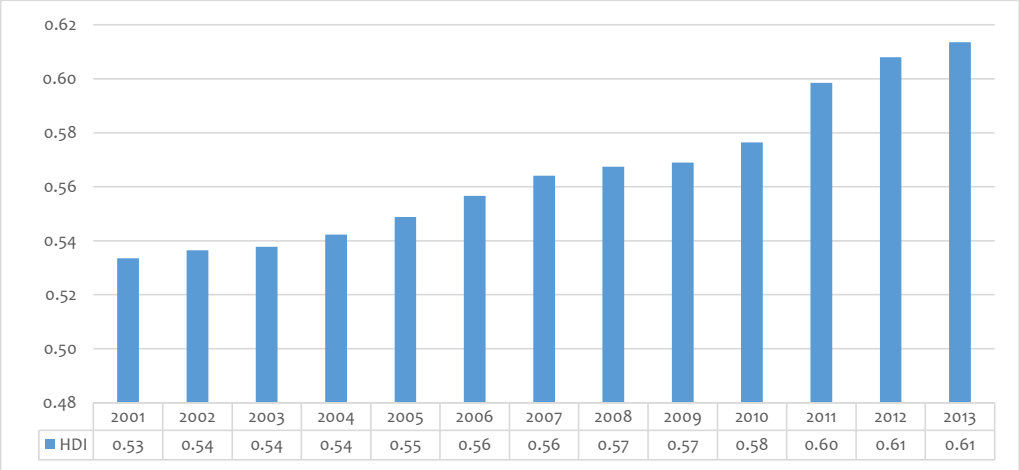
Figure 3, above illustrates the economic structure of the Northern Cape during 2013. It clearly depicts that the Northern Cape economy is nestled in the Mining and the Community Services sector, with both managing a considerable contribution of 27.7% and 26.3% towards the provincial economy. Whilst the least contributors during 2013, were Manufacturing, Electricity and construction, contributing 0.6%, 3.2% and 2.2%, respectively.

2.2 Human Development, Poverty and Inequality

Human Development Index (HDI) is the most utilised measure to quantify, whether a country's population is developing or not. In defining the HDI, the United Nations (UN) proclaims that it measures the quality of life. In that it is a composite statistic of the life expectancy, education attainment, and income status.

Thus through the HDI, one is able to deduct whether a regions population is generally developing or not. As such, in the case of the Northern Cape, the province has noted considerable improvements in the general wellbeing of its citizenry, and development. In 2001, the Northern Cape had an HDI figure of 0.53, which improved to 0.57 at the height of the recession (2009). It furthermore improved between 2010(0.58) and 2013(0.61).

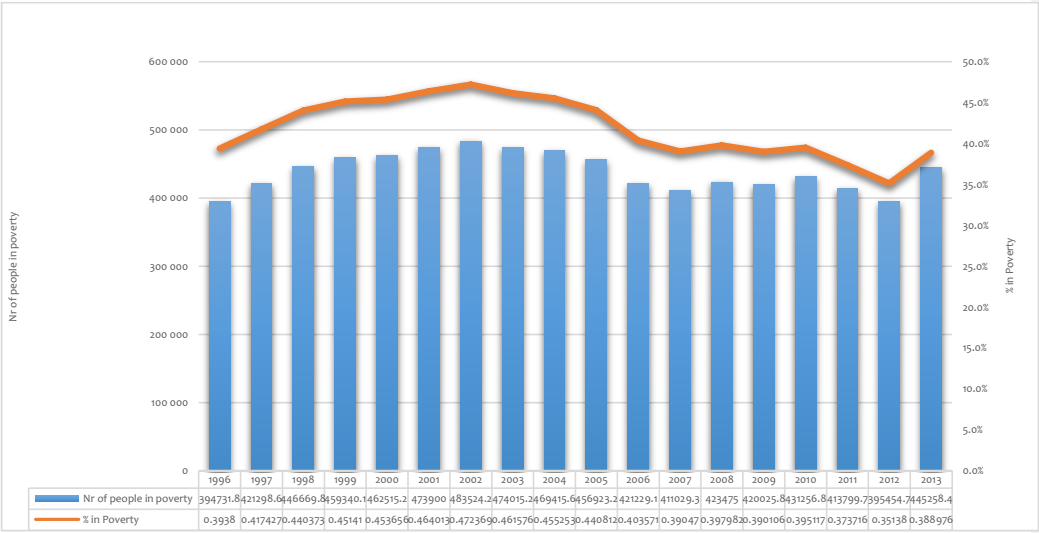
Figure 4: Human Development Index (HDI), Northern Cape: 1996 -2013



Source: IHS Global Insight Regional explorer version 745

However in the latter two years of the period studied, the index has stagnated around 0.61, thus spelling a challenge to the Policy developers and development practitioners to come up with innovative was to improve. An HDI below 0.5 represents underdevelopment, 0.8 medium development, and an HDI above 0.8 represents high development. In context, with an HDI of 0.61, the Northern Cape can be keenly said to be a medium-developing province.

Figure 5: Number of people in poverty, Northern Cape

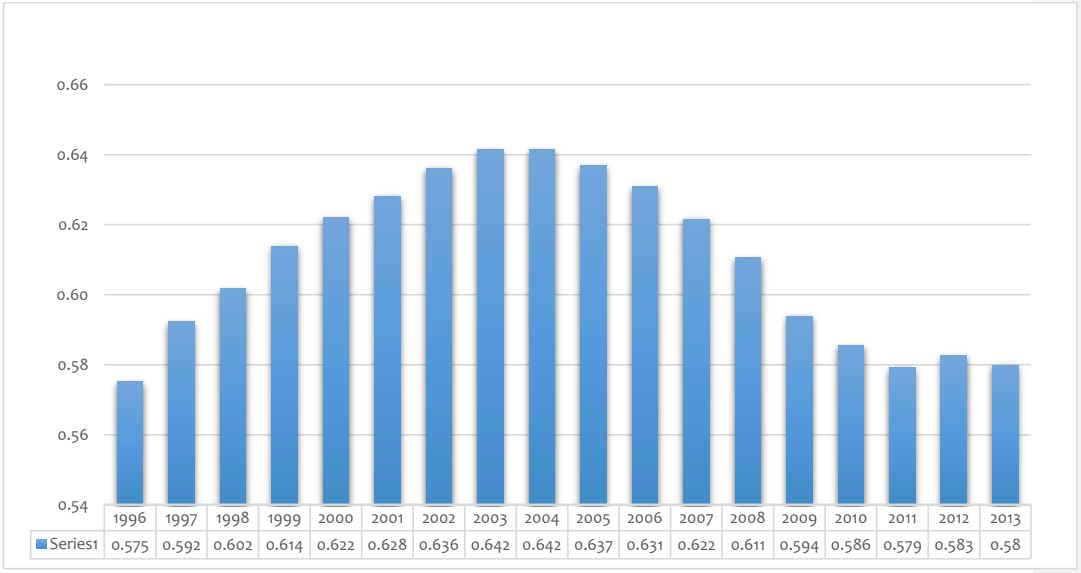


Source: IHS Global Insight Regional explorer version 745

According to the National Development Plan (NDP), ***poverty*** is considered to be one of the triple challenges facing the Democratic South Africa, along with ***inequality*** and ***unemployment***. Thus through the NDPs Vision 2030, the South Africa government proclaims to turn the tide against these developmental challenges. The above figure indicates the number of people living in poverty and the rate thereof, for the period 1996 and 2013. There has been a slight decrease in the overall provincial number of people living in poverty since 2009, from 39, 6% to 38.9% in 2013. However, two of the five district municipalities have had increases in poverty levels, and these are Frances Baard and ZF Mqcawu.

One of the identified developmental challenges in the Democratic dispensation is the inequality that is prevalent. With the most prominently used measure of Inequality the world over is the Gini-Coefficient and South Africa is seen as the most unequal society in the world (UN Development Report, 2012).

Figure 6: Gini Coefficient, Northern Cape

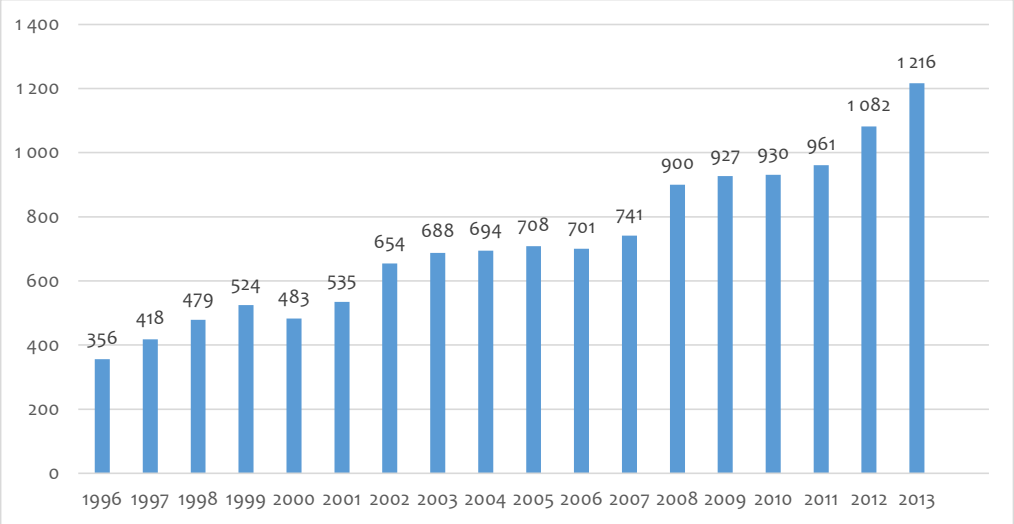


Source: IHS Global Insight Regional explorer version 745

Income inequality has decreased between 2002 and 2012, from 0.64 to 0.58 respectively. It remained at 0.58 in 2013. Inequality remains one of the structural constraints plaguing the provincial growth. Between 2012 and 2013, income inequality in the Northern Cape (as measured by the Gini Coefficient[2]) has remained unchanged at 0.58.

[2] The Gini Coefficient can still be considered high however, since perfect inequality is measured at 1, while perfect equality is measured at 0.

Figure 7: Poverty Gap (R million) Total, Northern Cape



Source: IHS Global Insight Regional explorer version 745

The above figure indicates the poverty gap between 1996 and 2013. It is a measure used to reflect the intensity of poverty, looking at the average shortfall of the population from the poverty line. Simplistically, the Poverty gap puts into context the amount of monetary resources needed to pull those in poverty out. Therefore for the people of the Northern Cape to be out of poverty, roughly R 356 million would have been required, during 1996. This figure has however grown overtime, with the widening of inequality in both the province and the country. Thus, poverty gap in the Northern Cape has increased over time and was R1, 216 billion in 2013. Therefore, over R 860 million would be needed compared to eighteen years age, amounting to annual increases of R 48 million yearly.

3. Methodological approach and the Data

Methodology and data used signify the bedrock of any credible research work and thus it would be impractical and even unfathomable not to analyse. Therefore the methodology's practicality needs to be understood and thus the assessment of the data is paramount. This section of the report is geared at articulating the methodological approach to the research. Impervious is the fact that the report is rather a quantitative undertaking resting on a few literature work, however a burgeoning field. First and foremost the section would attempt to discuss the thought behind the approach (methodology), and thus follow-on with an analysis of the variables key to the approach:

3.1 The Thought

Poverty reduction is a major goal for today's globalised world. Many countries, more so in the Emerging-markets and Developing countries, have developed poverty reduction strategies inquest to defeat the insurgent growth in poverty levels. Many Developmental Scholars (Chen (2003), McCulloch (2000) and Kakwani (2000), etc.), contend that poverty reduction can be achieved by economic growth and/or favourable redistribution of income. Whilst also the resounding consensus being that economic growth alone would not be sufficient for poverty reduction. And therefore many emphasising that redistribution of income should be an integral ingredient.

The transition of Development Economics is rather intriguing given the worryingly persistent poverty levels. Scholars on the subject, have transitioned from the pro-poor quandary to the latest buzzword "inclusiveness or inclusive-growth". The transition is premised on the realisation that most countries are still faced with stubbornly high percentages of their populations living in poverty. Implying that rapid growth rates experienced pre-recession and post, did not have favourable impact on the marginalised poor. The transition to a more inclusive than pro-poor growth, is set to be a more appropriate measure of development.

Therefore this report has a rather a quantitative retrospective approach to the current developmental dilemma. Wherein, the report first assesses and notably estimates measures of pro-poor growth and then attempts to qualify inclusivity, by quantifying an inclusivity growth index premised on the work of Ramos et al (2013) and Anand et al (2013).

3.2 Data and data sources

The study uses data from IHS Global Insight database, to estimate and quantify the various pro-poor growth measures and also the calibration of an inclusive growth index. The data used spans from 1996 to 2013, and IHS Global Insight depends on varied sources (surveys) to build its database. Table 1 below depicts a number of variables studied, and thus the table offers a descriptive statistics of each studied variable. Whereas table 2 explains in brief the relationship between variables using the correlation coefficient[3] (i.e. *r*).

Simplistic data analysis is essential in contextualising variables/indicators in such an undertaking, and thus implicitly gives credence to the reporting. Table 1(see below) provides the descriptive statistics of the individual variable, under the null hypothesis of normality. And also key is that all the variables studied are normally distributed at 5% percent level of significance.

[3] The correlation coefficient, denoted by r, is a measure of the strength of the straight-line or linear relationship between two variables. The correlation coefficient takes on values ranging between +1 and -1. The following points are the accepted guidelines for interpreting the correlation coefficient: 0 indicates no linear relationship, +1 indicates a perfect positive linear relationship: as one variable increases in its values, the other variable also increases in its values via an exact linear rule; and-1 indicates a perfect negative linear relationship: as one variable increases in its values, the other variable decreases in its values via an exact linear rule.

Table 1: Descriptive Statistics

	Total population	Gini coefficient	Number of Poverty	% Poverty	Poverty gap (R million)	Economically Active Population	EAP %	Number of unemployed people	Unemployment rate	GDP growth	EPR	EPR %
Mean	1050476.42	0.609668	439103.47	0.419	722.055675	364481.9	0.34685633	101764.446	0.27733978	0.021377	262717.424	0.250072
Standard Error	9963.72581	0.00558	6592.90961	0.008527	56.3701936	6293.196	0.00470936	4316.04935	0.0086262	0.013076	3267.37469	0.001892
Median	1033830	0.612336	438257.59	0.410499	697.333085	371182.9	0.35122753	106459.911	0.27935305	0.014538	263576.012	0.247865
Standard Deviation	42272.5085	0.023675	27971.3466	0.036175	239.158477	26699.77	0.01998014	18311.4466	0.03659788	0.053916	13862.2968	0.008025
Sample Variance	1786964977	0.000561	782396228	0.001309	57196.7771	7.13E+08	0.00039921	335309076	0.00133941	0.002907	192163272	6.44E-05
Kurtosis	0.00658498	-1.588051	-1.25738948	-1.239604	-0.52813169	1.20865	0.66223895	0.46346147	-0.2189836	-0.561215	-1.0523929	-1.168463
Skewness	1.02373789	-0.077826	-0.01154602	-0.077209	0.4075434	-1.326879	-1.13237608	-1.1984366	-0.6277	-0.149303	0.04664969	0.339242
Range	142328	0.06647	88792.3724	0.120989	860.399037	98815.1	0.06687821	58264.2231	0.12271071	0.183463	46703.0499	0.024427
Minimum	1002366.5	0.575104	394731.827	0.35138	355.841997	302418.3	0.30170437	60690.4111	0.20068363	-0.075559	241727.938	0.238888
Maximum	1144694.5	0.641575	483524.2	0.472369	1216.24103	401233.5	0.36858258	118954.634	0.32339433	0.107905	288430.988	0.263314
Sum	18908575.5	10.97402	7903862.46	7.542007	12997.0021	6560674	6.24341387	1831760.02	4.99211601	0.363413	4728913.63	4.501302
Count	18	18	18	18	18	18	18	18	18	17	18	18

Source: NC DEDaT Research and Development Unit calculations based on IHS Global Insight data

Table 2: Correlation Matrix

	Total population	Gini coefficient	Number in Poverty	% Poverty	Poverty gap (R million)	EAP	EAP %	Number of unemployed	Unemployment rate	GDP growth	EPR	EPR %
Total population	1											
Gini coefficient	-0.5241519	1										
Number in Poverty	-0.38626682	0.71691886	1									
% Poverty	-0.7246515	0.7617848	0.915177491	1								
Poverty gap (R'm)	0.961693922	-0.32755442	-0.25324946	-0.61099473	1							
EAP	0.655730666	0.23071531	0.136861484	-0.1857452	0.7529322	1						
EAP %	0.14727469	0.67613736	0.45999936	0.27690318	0.30163103	0.84320367	1					
Number of unemployed	0.349829546	0.58747148	0.421064993	0.1600142	0.5075926	0.87543826	0.8996515	1				
Unemployment rate	0.164866316	0.71669923	0.539361826	0.32933514	0.34133404	0.73588453	0.849855755	0.97071201	1			
GDP growth	-0.40616052	-0.02904486	0.486744758	0.52351432	-0.55872307	-0.49447134	-0.29158597	-0.39183722	-0.28659818	1		
EPR	0.800875405	-0.33164829	-0.29260224	-0.56912975	0.77969485	0.76965807	0.435672623	0.36520305	0.13510072	-0.3746303	1	
EPR %	0.069645455	0.11289685	0.007194409	-0.02685887	0.08087279	0.45622843	0.544175567	0.17089677	0.0223229	-0.07427489	0.65298174	1

Source: NC DEDaT Research and Development Unit calculations based on IHS Global Insight data

Studying the relationship between variables is key in understanding the movements thereof. And thus somewhat inference could be made based on the interrelationships. However, it is crucial to state that strong correlation does not imply that one variable influences the other[4]. But rather the likelihood that if one variable increases, the probability that other will move in a similar direction is high. Since economic growth is a key variable in the report, it would be the first to be studied.

Growth has a rather peculiarly moderate yet positive relationship with poverty, wherein r = 0.52 for percentage of people living in poverty, and r = 0.49 in terms of the numbers thereof. The peculiarity stems from the fact that, Development Economics theory suggest that growth should have a rather inverse relationship to poverty. Meaning they should move in opposite direction, not necessarily similar direction as in this instance. Which points to the fact that in the case of the Northern Cape poverty and growth move in tandem (study with Table 2 above).

What is also peculiar is the relationship between growth and employment-to-population (EPR or often referred to as absorption rate in some studies). Developmental studies literature teaches that growth should translate to an increase in labour absorption, thus intuitively, the expectation is that a strong positive relationship should exist. However, the inverse is true in this instance. A moderately weak relationship exist between growth and EPR, with a correlation coefficient of –0.38(for the actual number of EPR) and -0.08 in terms of percentages. Therefore, simply implying economic growth is realised without increases in the employment-to-population ratio. Whilst also mindful that correlation does not necessarily mean causality.

The bane of the Democratic South Africa's existence has been the ever-widening inequality that continues to permeate in the country. Studies by McCullough and Baulch (2000), have explored the relation between inequality (measured using the Gini-Coefficient) and growth. In the case of the Northern Cape, growth has a "some-what" weak correlation to inequality, with a correlation coefficient of r = - 0.03. The somewhat weak relationship is unexpected, as the expectation would be the transition should be strong. A strong negative correlation would mean that with substantive economic growth, an inverse relationship should exist where inequality would decline.

4. Defining and spelling the uses of "*Pro-Poor growth*" measures

This section of the report scantly reviews some of the pro-poor measures used in the realm of Development economics. The idea is to simplistically assess the performance of the Northern Cape based on these measures. The section starts off with a review and computation of the Poverty Bias of Growth, followed by the simplistic Growth Elasticity of poverty measure. Following on will be a synoptic computation and analysis of the Pro-Poor Growth Index, and thus ends off by tackling the Poverty Equivalent Growth rate.

[4] Influence of one variable on another could be established through the use of causality testing methodologies. With the most preferred causality test being the ***Engle-Granger Causality test***. However since the purpose of this research initiative is to calibrate the pro-poor measures and the inclusiveness of growth, will only negate to referring than analysis.

4.1 Poverty Bias of Growth (PBG)

In summary of their paper McCullough and Baulch (2000: 01), posit that despite the widespread agreement, that in developing countries economic policy should endeavour to promote pro-poor growth, . McCullough and Baulch (2000), however, concede that there is little agreement regarding the definition of pro-poor growth. Furtherance, McCullough et al (2000) developed a measure called the '***poverty bias of growth***' (PBG), in an attempt to qualify the argument of giving credence to what actual pro-poor is and who are those benefitting from pro-poorness growth.

Premised on the attempt to both qualify and quantify pro-poorness, the Poverty Bias of Growth is calculated by subtracting changes in the poverty headcount; which occurred between any two periods under actual circumstances, from the change in poverty that would have occurred if all had gained equally.

Table 3: Northern Cape Poverty Bias of Growth using GDP-R growth – 1997 – 2013

	GDP-R	GDP-R growth	Gini-Coefficient	Gini-Coefficient - growth	PBG	
1996	29 113 560		0.575			
1997	30 331 054	0.042	0.592	0.030	-0.072	Anti-Poor
1998	30 969 649	0.021	0.602	0.016	-0.037	Anti-Poor
1999	31 752 650	0.025	0.614	0.020	-0.046	Anti-Poor
2000	32 466 736	0.022	0.622	0.013	-0.036	Anti-Poor
2001	31 929 895	-0.017	0.628	0.010	0.006	Pro-Poor
2002	32 418 321	0.015	0.636	0.013	-0.028	Anti-Poor
2003	33 564 911	0.035	0.642	0.008	-0.044	Anti-Poor
2004	34 398 120	0.025	0.642	0.000	-0.025	Anti-Poor
2005	35 648 816	0.036	0.637	-0.007	-0.029	Anti-Poor
2006	37 159 843	0.042	0.631	-0.010	-0.033	Anti-Poor
2007	38 617 937	0.039	0.622	-0.015	-0.025	Anti-Poor
2008	39 351 723	0.019	0.611	-0.018	-0.001	Anti-Poor
2009	38 153 329	-0.030	0.594	-0.028	0.058	Pro-Poor
2010	39 119 822	0.025	0.586	-0.014	-0.011	Anti-Poor
2011	39 986 221	0.022	0.579	-0.011	-0.011	Anti-Poor
2012	40 411 113	0.011	0.583	0.006	-0.016	Anti-Poor
2013	41 048 867	0.016	0.580	-0.005	-0.011	Anti-Poor

Source: NC DEDaT Research and Development Unit calculations based on IHS Global Insight data

The poverty bias of growth measure reveals that in the Northern Cape growth is rather anti-poor. With only the recession period offering relieve to the poor (see Table 1, above). During the two recession periods, the Northern Cape economy grew at a level of -1.7 %(2001) and -3.1 %(2009), leading to a PGB of 0.01 and 0.06, for the respective periods. Noting that the PGB only reflected "*pro-poor growth*" during recession period, thus the table below utilises the GDP-R per capita growth as a measure of pro-poorness in the Northern Cape. That is, it uses the same analytic premise for the PGB, however, using GDP per Capita instead of the confirmative GDP growth.

Table 4: Northern Cape Poverty Bias of Growth using GDP-R per Capita growth – 1997 - 2013

	GDP-R per Capita[5]	GDP-R per Capita growth	Gini-Coefficient - growth	Poverty Bias of Growth	Remark
1996	29 045				
1997	30 052	0.035	0.030	-0.065	Anti-Poor
1998	30 533	0.016	0.016	-0.032	Anti-Poor
1999	31 205	0.022	0.020	-0.042	Anti-Poor
2000	31 845	0.021	0.013	-0.034	Anti-Poor
2001	31 264	-0.018	0.010	0.008	Pro-Poor
2002	31 670	0.013	0.013	-0.026	Anti-Poor
2003	32 684	0.032	0.008	-0.040	Anti-Poor
2004	33 360	0.021	0.000	-0.021	Anti-Poor
2005	34 392	0.031	-0.007	-0.024	Anti-Poor
2006	35 602	0.035	-0.010	-0.026	Anti-Poor
2007	36 686	0.030	-0.015	-0.016	Anti-Poor
2008	36 983	0.008	-0.018	0.009	Pro-Poor
2009	35 436	-0.042	-0.028	0.069	Pro-Poor
2010	35 842	0.011	-0.014	0.003	Pro-Poor
2011	36 113	0.008	-0.011	0.003	Pro-Poor
2012	35 907	-0.006	0.006	0.000	Pro-Poor
2013	35 860	-0.001	-0.005	0.006	Pro-Poor

Source: NC DEDaT Research and Development Unit calculations based on IHS Global Insight data

Similar to using the PGB computed by GDP-R growth, the use of GDP-R per Capita also reveals that for the recession periods, growth in income was pro-poor. What is also positive to note, is that the income growth has been pro-poor since the 2009 financial recession. Which could be related to the expansion of employment creation by the Public Sector. As the sector has recorded cumulative improvements, in employment creation over the recent past. Also what could be construed as a contributor is the social grant network, and the general improvements in the dissemination thereof (Social Grants Implementation and management).

4.2 Growth Elasticity of Poverty (GEP)

Heltberg (2002:01), purports that social scientists have long debated the relationship between growth and poverty. Emphasizing his articulation, Heltberg (2002) writes that one side of the debate is represented by the growth optimists, whose argument is premised on the "trickle-down effect" of growth. This is the notion that, growth in average incomes would automatically sink down to and benefit the impoverished. Whereas, the other side of the discourse, punts a view that places much emphasis on the distribution of income and wealth at its epicentre. And therefore puts forward the argument that reductions in inequality would lead to declines in the number of persons living in poverty.

[5] In the simplest form GDP per Capita is calculated by diving the Gross Domestic Product by the total population in the region/province/country.

In furtherance of his assertion Heltberg (2002) defines this notion as the "immiserizing growth", which is the idea that growth in average income may well occur whilst the number of the impoverished continues growing. Growth Elasticity of Poverty (GEP) is mainly dependent on two factors which are initial level of inequality and degree of poverty. Simply it can be defined as percentage ratio between differences in poverty, in relation to per capita income with an assumption that Income is distributed evenly amongst the broader populace. The GEP measure has attempted to explain the concern, of whether Growth in economy will reduce poverty and inequality within a society.

Traditional Economists always focused on improving economic growth as a means of reducing poverty, with the assumption that the poor will benefit automatically, with increases in the overall economy. In a nutshell, growth and poverty should have an inverse relationship, that is, when growth accelerates poverty should decelerate. Thus simplistically, to quantify the poverty (deceleration) and growth (acceleration) quandary, they developed the Growth Elasticity of Poverty (GEP). Which simply refers to the responsiveness of poverty to economic growth;

- Ideally, 1% increase in economic growth should translate to an even bigger decrease in poverty. Thus GEP is supposed to be negative, when economic growth is positive.
- Negative GEP means growth is generally pro-poor, positive GEP means growth is non-poor or anti-poor;

4.2.1 Computation of the Northern Cape Growth Elasticity of Poverty[6] (GEP)

For the purpose of this report the growth elasticity of poverty would be measured in two ways. Firstly, it would be through the Elasticity of poverty with respect to the GDP-R growth in the Northern Cape:

$$\text{GEP} = -\frac{\Delta\, GDP{-}R}{\Delta Poverty}$$

Secondly, the elasticity of poverty with respect to income (GDP-R per Capita): percentage change in the poverty headcount over the percentage change in growth.

$$\text{IEP} = -\frac{\Delta\, GDP{-}R\ per\ Capita}{\Delta Poverty}$$

[6] Elasticity measurement ranges from 0 to 1 whereby 1 means ability of people to respond to poverty situation is 100% through an increase in 1 unit of per capita income whereby 0 means no changes in poverty (non-responsive) is observed when per capita income changes. The measure emphasize close relationship between two approaches of poverty i.e. Income and capability whereby improving human development stimulates increase in income level.

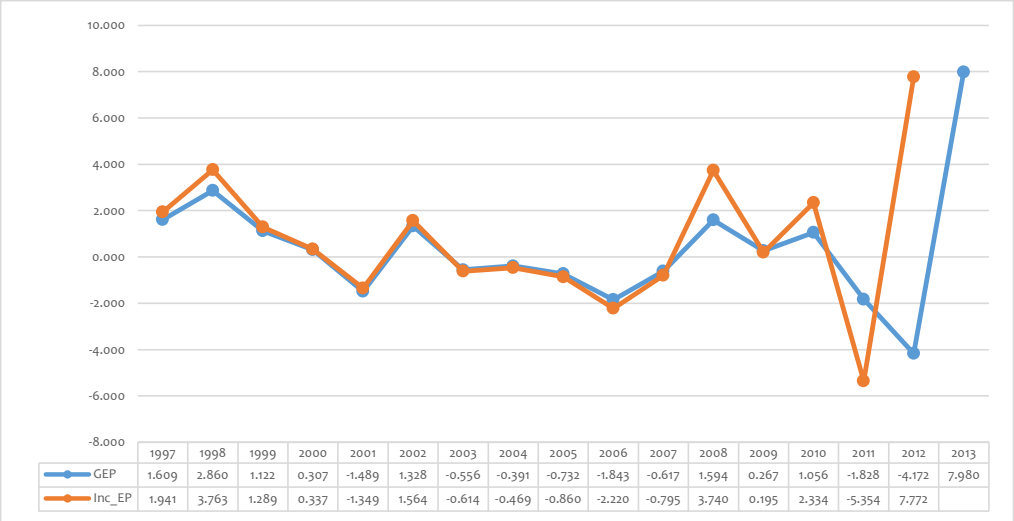
Table 5: Northern Cape Growth Elasticity of Poverty – 1997 - 2013

	# of People living in Poverty	Change in # of People living in Poverty	GDP-R	GDP-R growth	Growth Elasticity of Poverty	Remark
1996	394732		29 113 560			
1997	421299	0.067	30 331 054	0.042	1.6094	Anti-Poor
1998	446670	0.060	30 969 649	0.021	2.8603	Anti-Poor
1999	459340	0.028	31 752 650	0.025	1.1220	Anti-Poor
2000	462515	0.007	32 466 736	0.022	0.3074	Anti-Poor
2001	473900	0.025	31 929 895	-0.017	-1.4887	Pro-Poor
2002	483524	0.020	32 418 321	0.015	1.3276	Anti-Poor
2003	474015	-0.020	33 564 911	0.035	-0.5560	Pro-Poor
2004	469416	-0.010	34 398 120	0.025	-0.3909	Pro-Poor
2005	456923	-0.027	35 648 816	0.036	-0.7319	Pro-Poor
2006	421229	-0.078	37 159 843	0.042	-1.8430	Pro-Poor
2007	411029	-0.024	38 617 937	0.039	-0.6171	Pro-Poor
2008	423475	0.030	39 351 723	0.019	1.5935	Anti-Poor
2009	420026	-0.008	38 153 329	-0.030	0.2675	Anti-Poor
2010	431257	0.027	39 119 822	0.025	1.0555	Anti-Poor
2011	413800	-0.040	39 986 221	0.022	-1.8277	Pro-Poor
2012	395455	-0.044	40 411 113	0.011	-4.1721	Pro-Poor
2013	445258	0.126	41 048 867	0.016	7.9802	Anti-Poor

Source: NC DEDaT Research and Development Unit calculations based on IHS Global Insight data

Generally, growth in the Northern Cape has neither been consistently pro-poor nor anti-poor based on the computation of the growth elasticity of poverty. In fact, there has been shifts between pro-poor to anti-poor and vice-versa. The period 1997-2000, growth was considered anti-poor and transitioned to pro-poor between 2003 and 2007. And during this period (i.e. 2003 until 2007) the South Africa economy reached levels, last recorded in the 1980s. Meanwhile during the tumultuous period of recession, which refers to the period 2008-2010, growth tended to be rather anti-poor, meaning based on the growth elasticity of poverty measure of the pro-poorness growth benefitted the well-of during recession.

Figure 8: Northern Cape Growth Elasticity of Poverty and Income Elasticity of Poverty – 1997 - 2013



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
GEP	1.609	2.860	1.122	0.307	-1.489	1.328	-0.556	-0.391	-0.732	-1.843	-0.617	1.594	0.267	1.056	-1.828	-4.172	7.980
Inc_EP	1.941	3.763	1.289	0.337	-1.349	1.564	-0.614	-0.469	-0.860	-2.220	-0.795	3.740	0.195	2.334	-5.354	7.772	

Source: NC DEDaT Research and Development Unit calculations based on IHS Global Insight data

The figure above depicts two elasticity of poverty measures, which are based on per capita income growth (GDP-R per Capita) and the overall economic growth. Observable from the graph is that the two measures move in unison, thus implicitly implying that those benefitting from general increases in per capita income growth tended to benefit from economic growth. Ideally, the expectation would be that both measures should exhibit a gravitation towards pro-poor growth. However, only the period between 2003 until 2007 could be construed to have indicatively exhibited sustained pro-poor growth, based on the two measures.

4.3 Pro-Poor Growth Index (PPGI)

Kakwani and Pernia (2000:06) considers that growth is pro-poor when the poor receive the benefits of growth proportionally more than the non-poor. Like McCulloch and Baulch, they proposed a pro-poor growth index (PPGI) using the poverty decomposition method similar to the one proposed by Kakwani (2000).

4.3.1 Computing Northern Cape Pro-Poor Growth Index (PPGI)

The PPGI index shows the ratio of the elasticities for total poverty reduction and poverty reduction in the case of distribution-neutral growth. This ratio will be greater than one when a growth scenario is pro-poor. However, like some other pro-poor measures/index, this index does not increase when the rate of poverty reduction is higher. The PPGI (ϕ) can be formally (mathematically) written as:

$$\Phi = \delta/\eta$$

Where, δ is the total poverty elasticity of growth and η is the growth elasticity of poverty (holding inequality constant). Thus, growth is considered pro-poor (anti-poor) if the change in

inequality that accompanies growth, reduces (increases) the total poverty. Thus, the growth is pro-poor (anti-poor) if the total elasticity of poverty is greater (less) than the growth elasticity of poverty. In simpler terms as proposed by Kakwani and Pernia (2000) and cited by Cheema and Sial (2012:04), the pro-poor growth index can be written as such:

$$\Phi = \eta_g / \eta$$

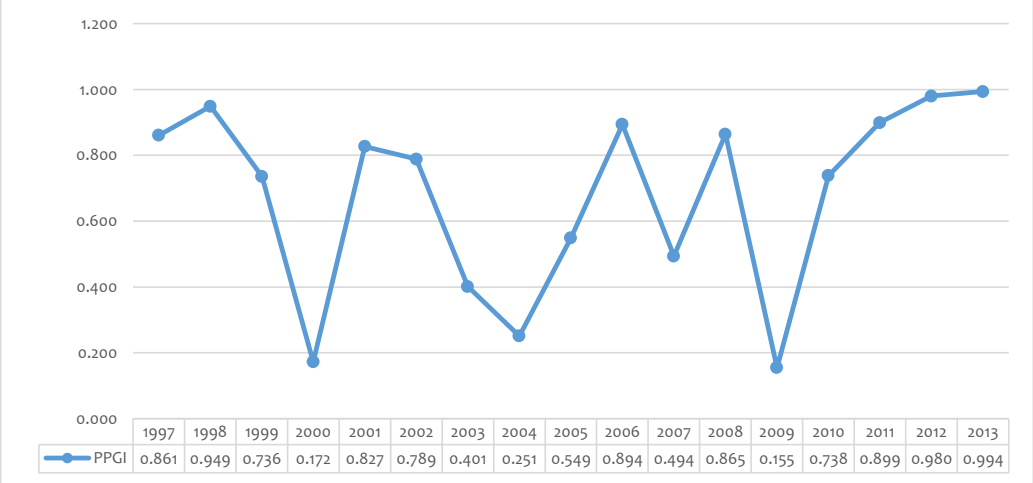
Wherein:

$$\eta = \eta_g + \eta_l$$

η = total poverty elasticity of growth;
η_g = growth elasticity of poverty; and
η_l = inequality elasticity.

Therefore the picture below depicts the general findings pertaining to the Northern Cape pro-poorness measured using the Pro-Poor Growth Index (PPGI).

Figure 9: Northern Cape Pro-Poor Growth Index (PPGI)



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
PPGI	0.861	0.949	0.736	0.172	0.827	0.789	0.401	0.251	0.549	0.894	0.494	0.865	0.155	0.738	0.899	0.980	0.994

Source: NC DEDaT Research and Development Unit calculations based on IHS Global Insight data

For critical comprehension and to simplify the analysis of the index, it crucial that explanatory boundaries be placed. Based on Kakwani et al (2000:14-15) initial empirical results, we arrive at the following value judgments regarding the pro-poor growth index (φ).

If,

- $\varphi < 0$, growth is non-poor;
- $0 < \varphi \leq 0.33$, growth is weakly pro-poor;
- $0.33 < \varphi \leq 0.66$, growth is moderately pro-poor;
- $0.66 < \varphi < 1.0$, growth is pro-poor; and

- Φ ≥ 1.0, growth is highly pro-poor.

For the period under review (i.e. 1997 until 2013), the averaged index for the period is about 0.68, thus in context the index is between 0.66< φ<1.0. Therefore, in general it is sound to infer that growth was pro-poor based on this measure/index. However, interesting to note, that between 2003 and 2005, the Northern Cape provincial economy grew around 3.3%, yet in terms of pro-poorness, it grew moderately pro-poor. In that index was between 0.33 and 0.66, which was an averaged 0.40 index points.

Whilst the period wherein growth impacted immensely on the poor was at the height of the financial crisis(2009), where the index was at 0.15 index points, which is considered weakly pro-poor. In summary, based on the PPGI in the Northern Cape, that growth has been moderately pro-poor (based on the averaged 0.68 index points of the period analysed).

4.4 Poverty Equivalent Growth Rate (PEGR)

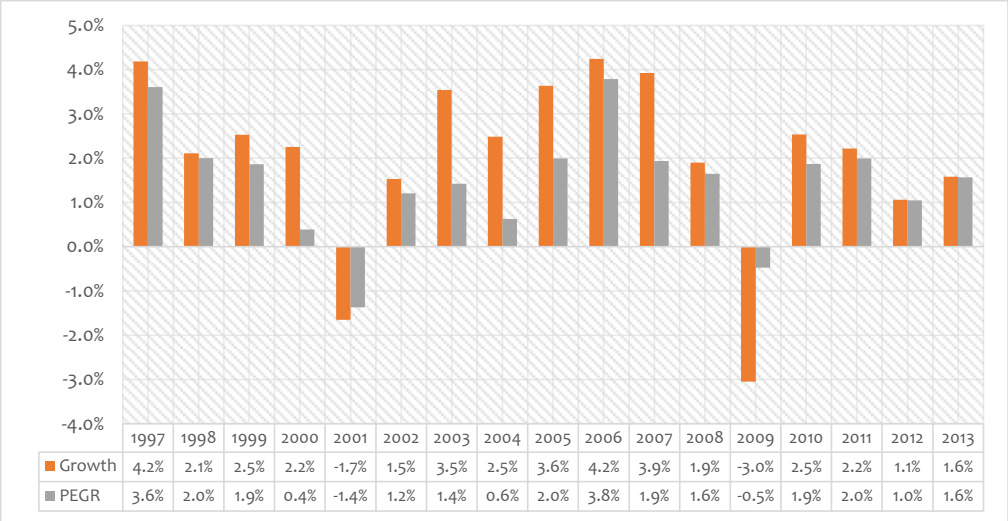
Kakwani, Khandker and Son (2007), are some of the most recognised and prolific students on the poverty and growth dichotomy. In their paper focusing on Korea and Thailand, Kakwani et al (2007), outline that the paper looks into the interrelationship between economic growth, inequality and poverty. Through the idea of pro-poor growth, the study examined to what extent the poor benefit from economic growth (Kakwani et al).

Kakwani et al (2007:01-02), developed a pro-poor growth poverty index measure called '***poverty equivalent growth rate***' (PEGR). The PEGR takes account of both the magnitude of growth and the benefits of growth the poor receive. It is shown that the proportional reduction in poverty is a monotonically increasing function of the poverty equivalent growth rate. Kakwani et al (2007) argued, therefore, that to achieve a rapid reduction in poverty, the poverty equivalent growth rate should be maximized rather than the growth rate itself. Simply put, the Poverty equivalent growth rate should surpass economic growth, for a region to attain increased reduction in the poverty levels.

4.4.1 Calculating the Northern Cape Poverty Equivalent Growth Rate (PEGR)

In the previous section the Pro-Poor Growth Index (PPGI) was computed and thus analysed, however the one discernible feature or variable not incorporated is the actual growth rate. Thus upon this startling realisation Kakwani and Son (2003) developed the Poverty Equivalent Growth Rate (PEGR). As a mechanism to discernibly quantify the impact of growth in the pursuit of achieving poverty reduction. Thus the figure below illustrates the growth and juxtaposes it to the poverty equivalent growth rate for the Northern Cape.

Figure 10: Northern Cape Poverty Equivalent Growth Rate (PEGR) and growth – 1997 – 2013



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Growth	4.2%	2.1%	2.5%	2.2%	-1.7%	1.5%	3.5%	2.5%	3.6%	4.2%	3.9%	1.9%	-3.0%	2.5%	2.2%	1.1%	1.6%
PEGR	3.6%	2.0%	1.9%	0.4%	-1.4%	1.2%	1.4%	0.6%	2.0%	3.8%	1.9%	1.6%	-0.5%	1.9%	2.0%	1.0%	1.6%

Source: NC DEDaT Research and Development Unit calculations based on IHS Global Insight data

After the onset of the financial crisis, actual growth rates became higher than the PEGRs between 2010 and in 2011. This indicates that the crisis had adverse impact on the poor rather than on the well-off. This result is to be expected as poor people are more vulnerable to such unexpected economic shocks. This, in turn, calls for a permanent system of social safety net, which can protect vulnerable groups of people in society from economic downturns (see Kakwani et al (2003)).

In sum, the varied measures on pro-poorness, indicate a somewhat slant to non-convergence on pro-poor growth periods. In simpler terms the expectation would be that the four measures would unequivocally express the same opinion of pro-poorness or non-pro-poorness, or the periods thereof (i.e. pro or anti). However, the computed results indicate otherwise. What was obvious was the fact that the, Northern Cape has registered anti-poor growth rates. The ambiguity in the four pro-poor measures have weight-in on the developed of the inclusive growth index measure. Which its provision is that all should benefit during growth periods. Thus the section that follows hereon attempts to compute the performance of the Northern Cape economy premised on the inclusiveness of its growth.

5. Inclusive growth measure as advanced by Fourie (2014)

Defining inclusive growth is simple intuitively, but practically complex. As it combines the concepts of growth and distribution into a single measure and thus requires one to specify the trade-off between them (see winters (2014:06)). Whilst, according to Fourie (2014:03), inclusive growth, now the preferred concept internationally, is relatively new and the debate on the appropriate definition and measurement of inclusive growth is ongoing. He furthermore insists that most proposals involve two or more components that are related to income, poverty, employment or distribution (or equity). Which were explored in somewhat detail in the pro-poor growth measure section of this report.

Similar to Fourie (2014), the World Bank's attempt in defining inclusive growth, maintain that growth has to be rapid. And furthermore sustained poverty reduction requires inclusive growth that allows people to contribute to and benefit from economic growth. Rapid pace of growth is unquestionably necessary for substantial poverty reduction. But for growth to be sustainable in the long run, it should be broad-based different sectors, and inclusive of the large part of the country's labour force. Thus this definition of inclusive growth implies a direct link between the macro and micro determinants of growth.

5.1 Computing Northern Cape Inclusiveness Index – Ramos et al (2013)

Fourie's (2014:04) is a proponent of the ***Inclusiveness Growth Index (IGI)*** developed by the International Policy Centre for Inclusive Growth (IPCIG) and premised his article on its findings. It contains three equally-weighted components: two outcomes-based, or benefit-sharing measures, i.e. a measure of poverty and a measure of income inequality; and one process-based measure, i.e. a measure of employment participation. The indicators are:

- For participation: the employment-to-population ratio (EPR), i.e. the absorption rate; and
- For benefit sharing: the poverty headcount ratio (H) and the Gini coefficient (G).

Fourie (2014) and Ramos et al (2013), purport that a region's ***Inclusiveness Index*** is calculated relative to the data of the other countries, which are analysed for better analytical understanding. Intuitively, it represents a region's position regarding poverty, inequality and employment relative to the best situations within the group of countries. The ***Inclusiveness Index*** is constructed on a scale ranging from 0 to 1, with a higher index value implying a worse performance in terms of inclusiveness. Whereas, an index value gravitating to a zero, implying best inclusiveness performance.

Therefore the index would mathematically be expressed as:

$$IGI = \frac{3+6+\mathcal{I}}{3}$$

Wherein;

3 = employment-to-population;

Б = Poverty Headcount
$\mathcal{I}$ = Gini-Coefficient/Index

The inclusiveness Index is constructed on a scale ranging from 0 to 1. A higher index value implies a worse performance in terms of inclusiveness. Table 6 above discernibly indicates the index values for all the provinces of South Africa, for the periods 1996, 2001, 2009 and 2013. Important to bear in mind, is that a provincial index is calculated relative to the data of the other provinces analysed.

Table 6: Provincial Inclusive Growth Indices – Measured by based on Ramos et al (2013) method

					Min-Max Normalization			
		Gini-Coefficient	Poverty Headcount	EPR	Gini-Coefficient	Poverty Headcount	EPR	**IGI**
Western Cape	1996	0.554	748558	848458	0.00	0.09	0.24	**0.11**
	2001	0.601	1241315	905045	0.00	0.18	0.23	**0.13**
	2009	0.594	1585375	1079244	0.00	0.25	0.20	**0.15**
	2013	0.596	1813008	1277500	0.33	0.29	0.23	**0.28**
Kwa-Zulu Natal	1996	0.597	4290997	1607758	1.00	1.00	0.55	**0.85**
	2001	0.649	5250664	2133207	0.99	1.02	0.64	**0.88**
	2009	0.628	5171920	2432164	0.65	1.00	0.54	**0.73**
	2013	0.611	5123162	2373013	0.62	1.00	0.49	**0.70**
Gauteng	1996	0.582	1622159	2726282	0.65	0.32	1.00	**0.65**
	2001	0.641	2660724	3195212	0.83	0.47	1.01	**0.77**
	2009	0.647	3660926	4302013	1.00	0.68	1.00	**0.89**
	2013	0.630	4118682	4539599	1.00	0.79	1.00	**0.93**
Free State	1996	0.571	1085412	744401	0.40	0.18	0.20	**0.26**
	2001	0.636	1372979	825640	0.72	0.20	0.20	**0.37**
	2009	0.617	1182230	766520	0.45	0.16	0.12	**0.24**
	2013	0.592	1140207	702835	0.24	0.15	0.10	**0.16**
Northern Cape	1996	0.575	394732	241728	0.49	0.00	0.00	**0.16**
	2001	0.628	473 900	262 185	0.56	0.02	0.01	**0.19**
	2009	0.594	420 026	273 585	0.01	0.00	0.00	**0.00**
	2013	0.580	445 258	288 431	0.00	0.00	0.00	**0.00**
Eastern Cape	1996	0.590	3406026	884 671	0.84	0.77	0.26	**0.62**
	2001	0.649	3971459	1 355 572	1.00	0.75	0.38	**0.71**
	2009	0.620	3535045	1288869	0.50	0.66	0.25	**0.47**
	2013	0.598	3430778	1238550	0.36	0.64	0.22	**0.41**
North West	1996	0.560	1195772	628595	0.14	0.21	0.16	**0.17**
	2001	0.620	1541153	764013	0.39	0.24	0.18	**0.27**
	2009	0.607	1492575	820635	0.24	0.23	0.14	**0.20**
	2013	0.590	1532158	796351	0.19	0.23	0.12	**0.18**
Limpopo	1996	0.583	2791588	627983	0.67	0.62	0.16	**0.48**
	2001	0.633	3245597	890153	0.65	0.60	0.22	**0.49**
	2009	0.615	2973727	919432	0.40	0.54	0.16	**0.37**
	2013	0.583	2862998	995326	0.06	0.52	0.17	**0.25**
Mpumalanga	1996	0.583	1565531	697217	0.67	0.30	0.18	**0.39**
	2001	0.630	1932754	849501	0.60	0.32	0.21	**0.37**
	2009	0.625	1859804	1000812	0.58	0.30	0.18	**0.36**
	2013	0.594	1834217	1074170	0.28	0.30	0.18	**0.25**

Source: NC DEDaT Research and Development Unit calculations based on IHS Global Insight data

Intuitively, it represents a provincial position regarding poverty, inequality and employment relative to the best situations within the group of provinces in the country. In relative terms the Northern Cape seems to have a better inclusiveness index compared to the non-inclusive growth recorded in Gauteng and Kwa-Zulu Natal province. Based on the Ramos et al(2013) inclusiveness calibration methodology, the Northern Cape is by far the most inclusive province in South Africa, with an index of 0.13(1996) and 0.19(2001), as well as 0.00 index for the other year's analysed.

Whilst Gauteng, Kwa-Zulu Natal and the Eastern Cape had the highest inclusive index of 0.93, 0.70 and 0.41, during 2013. Gauteng and Kwa-Zulu Natal provinces are the epitome of a growing South Africa, given the magnitude in contribution to the country's GDP. However, they also indicate the highest inequality, with respective Gini-Coefficients of 0.64 and 0.62, during 2013. The third biggest provincial economy (14.0% contribution to SA GDP (2013)), the Western Cape seemingly has a more inclusive growth, as computed by the Ramos et al (2013) method. The Western Cape, recorded an inclusive growth index of 0.11 in 1996, but has gradually regressed over the period analysed. In 2013, the Western Cape inclusiveness index stood at 0.25, however still considerably inclusive in comparison.

South Africa is place of contrasts and these contrasts bellow in the provinces. Contrasting in terms of the population size, growth outcomes and the employment of resources (labour and capital). These contrasts lend an ambiguity in the computation of the inclusive growth index, since a province with a population of 13 million is compared to one that has just over a million. Therefore the disparity is brought about by the comparative nature in the computation in the index. The index as proposed and applied by Ramos et al (2013), focuses on comparing extremes without proper acknowledgement of these extremes. Thus going forward the index is modified somewhat, and thereof uses the time-series methodology not the comparativeness approach[7].

5.2 Modified Inclusive Growth Index

Ramos R A, Ranieri R & Lammens J (2013), concluded that South Africa had an Inclusive Growth Index value of around 0.75 in 2006. And furthermore asserted that, the index value of 0.75 is considerably very high in a comparative context. Signifying that South Africa has a very low degree of inclusiveness compared to other developing countries in the world. Furtherance, Ramos et al(2013), assert that this low degree of inclusiveness could be attributable to, in most parts, a low labour absorption rate experienced in the country and very high income inequality (See also Fourie (2014)).

Premised on the findings of Ramos et al, as well as Anand et al (2013) conclusion of low degree of inclusiveness for South Africa. The table below (Table 7) tells a similar tale to Ramos findings, however the trick is that, unlike the comparative approach dispersed by Ramos et al, the focus here is intrinsic. In simpler terms the computation is calibrated using the country's own performance over the years (time-series type of approach). Thus according to the modified approach, in 2006, South Africa had an inclusiveness index of 0.82, worryingly high. Whilst,

[7] In the context of this research report a comparative approach refers to the calibration method applied by Ramos et al(2013), wherein they gauge the country's/region's inclusive growth index(IGI) relative to others.

inclusiveness was in contrast better in 2013, at an index value of 0.74, based on the modified approach. Worth highlighting is that at the height of its most prolonged growth periods, South Africa was at its highest non-inclusiveness. The period 2004 until 2008, South African economy recorded averaged growth of 4.92%, however there was little benefit sharing, as it also recorded the highest averaged 0.846 inclusiveness index. At the height of the financial crisis the Republic also exhibited traits of non-conformity as it had a 0.80 index, which is quite telling and implies that the recession was exclusive.

Table 7: Inclusive Growth Index[8] – South Africa – 1997 - 2013

				Min-Max Normalization[9] resultants			IGI_SA[10]
	Gini-Coefficient	Poverty Headcount	EPR Headcount	Gini-Coefficient	Poverty Headcount	EPR Headcount	
1996	0.60	17 100 776	9 562 586				
1997	0.62	18 306 833	9 718 883	0.254	0.214	0.035	0.168
1998	0.63	19 594 596	10 264 027	0.408	0.442	0.155	0.335
1999	0.64	20 474 454	11 120 965	0.621	0.598	0.345	0.521
2000	0.65	20 853 809	11 827 125	0.751	0.665	0.502	0.639
2001	0.66	21 690 546	11 985 919	0.859	0.813	0.537	0.736
2002	0.66	22 668 393	11 932 973	0.927	0.987	0.525	0.813
2003	0.67	22 629 124	12 018 457	1.000	0.980	0.544	0.841
2004	0.67	22 743 918	12 253 383	0.999	1.000	0.596	0.865
2005	0.66	21 973 763	12 675 617	0.975	0.864	0.690	0.843
2006	0.66	21 320 239	13 240 564	0.924	0.748	0.815	0.829
2007	0.66	21 111 531	13 711 220	0.847	0.711	0.919	0.825
2008	0.65	22 033 212	13 920 760	0.762	0.874	0.965	0.867
2009	0.64	21 881 628	13 840 255	0.615	0.847	0.948	0.803
2010	0.64	21 978 766	13 729 427	0.534	0.864	0.923	0.774
2011	0.63	21 702 950	13 717 766	0.456	0.816	0.920	0.731
2012	0.63	20 370 780	13 859 544	0.391	0.579	0.952	0.641
2013	0.62	22 300 468	14 076 737	0.311	0.921	1.000	0.744

Source: NC DEDaT Research and Development Unit calculations based on IHS Global Insight data

[8] The Inclusive Growth Index is built through a min–max normalisation of data on Poverty Headcount, Inequality (Gini-Coefficient) and the Employment-to-Population Ratio (EPR). Therefore, the index is the simple average of the three min–max normalisations. What is critical to note is the fact that contrary to Ramos *et al* (2013), the employment-to–population is not inverted. As when inverted, it diverges from the South African finding as concluded by the Ramos et al. this could be construed to the data quality or computational deficiencies.

[9] Normalizing the data attempts to give all attributes an equal weight. It is particularly useful for classification algorithms involving neural networks or distance measurements, such as nearest-neighbour and clustering. Min-Max Normalisation performs a linear transformation on the original data. Suppose that min_A and max_A, are the minimum and maximum values of an attribute, A. Therefore, Min-Max normalisation maps a value, v_i, of A to v'_i in the range $[new\_max_A, new\_min_A]$, by computing:

$$v'_i = \frac{vi - minA}{maxA - minA} (new_{maxA} - new_{minA}) + new\_minA$$

[10] Important to note that data utilised in this report is sourced from IHS Global Insight, and thus could mean that there are data inconsistencies. However, the index results still give an insightful depiction.

In terms of the Inclusive Growth Index, Fourie (2014:06) South Africa's inclusivity has declined since 1996: amidst high GDP growth rates, the index has climbed from 0.74 in 1996 to 0.77 in 2006. According to the modified index computations, the South Africa Inclusive Growth Index has averaged 0.723, leading to safely conclude that the South African growth has not being inclusive over the period analysed. In this period (1997 until 2013) the two positive elements in the SA inclusive index was the declining poverty ratio and an increasing employment-to-population ratio – but they were overshadowed by growing inequality (which has now stagnated).

Fourie(2014:06) declares that for economic growth to be considered inclusive, it must either lead to an improvement in all three indicators of inclusivity, or at least an improvement in one or two indicators but with the other indicator(s) stable/non-deteriorating (Ramos et al. 2013).

Table 8: Inclusive Growth Index – Northern Cape – 1997 - 2013

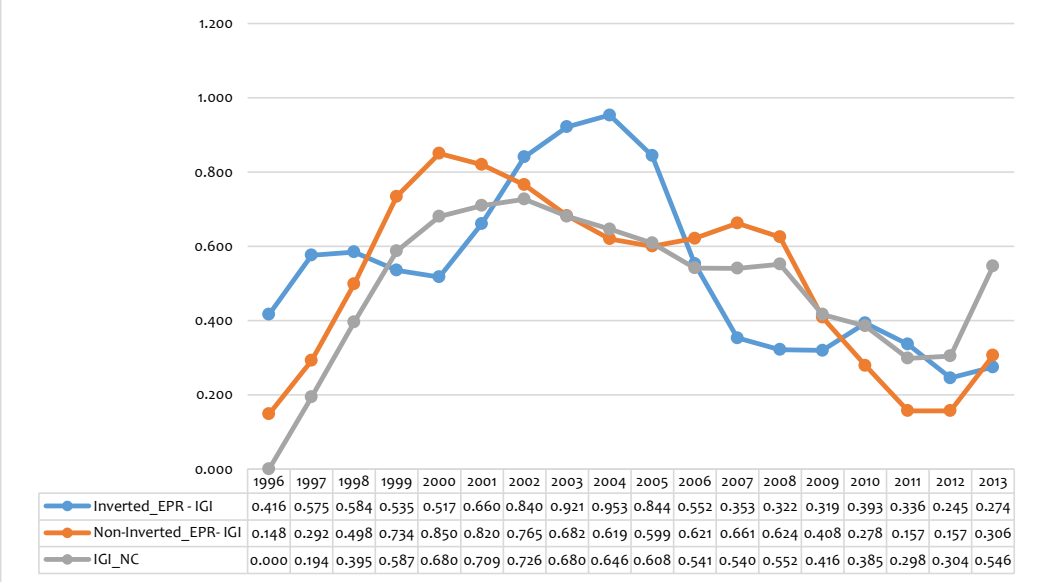
				Min-Max Normalization			IGI_NC
	Gini-Coefficient	Poverty Headcount	EPR Headcount	Gini-Coefficient	Poverty Headcount	EPR Headcount	
1996	0.58	394 732	241 728				
1997	0.59	421 299	242 859	0.2586	0.2992	0.0242	0.194
1998	0.60	446 670	251 213	0.3996	0.5849	0.2031	0.395
1999	0.61	459 340	262 728	0.5841	0.7276	0.4497	0.587
2000	0.62	462 515	268 456	0.7049	0.7634	0.5723	0.680
2001	0.63	473 900	262 185	0.7990	0.8916	0.4380	0.709
2002	0.64	483 524	253 917	0.9194	1.0000	0.2610	0.726
2003	0.64	474 015	248 720	1.0000	0.8929	0.1497	0.680
2004	0.64	469 416	246 320	0.9996	0.8411	0.0983	0.646
2005	0.64	456 923	250 858	0.9313	0.7004	0.1955	0.608
2006	0.63	421 229	264 424	0.8395	0.2984	0.4860	0.541
2007	0.62	411 029	276 189	0.7000	0.1835	0.7379	0.540
2008	0.61	423 475	278 944	0.5361	0.3237	0.7969	0.552
2009	0.59	420 026	273 585	0.2825	0.2849	0.6821	0.416
2010	0.59	431 257	269 198	0.1566	0.4114	0.5882	0.385
2011	0.58	413 800	270 520	0.0628	0.2147	0.6165	0.298
2012	0.58	395 455	278 640	0.1138	0.0081	0.7904	0.304
2013	0.58	445 258	288 431	0.0718	0.5690	1.0000	0.546

Source: NC DEDaT, Research and Development Unit calculation based on IHS Global Insight

Table 8 above depicts the Inclusiveness index derived using the modified computational approach, for the Northern Cape. At first glance the Northern Cape inclusiveness appears to be rather inclusive compared to the national scenario. For the period 1997 until 2013, the province has recorded an averaged 0.518 inclusive index, below the National average.

The only period that could be construed as comparatively lacking in inclusivity, is between 1999 and 2005. In which, the index hovered around an averaged 0.662. In stark contrast to the National picture, during the height of the financial crisis (2009), the province managed to register an inclusive growth index of 0.416. And continued to decline subsequent to the recession period, only to increase in 2013, where it recorded a growth index of 0.546.

Figure 11: Inclusive Growth Index – Northern Cape – 1996 - 2013

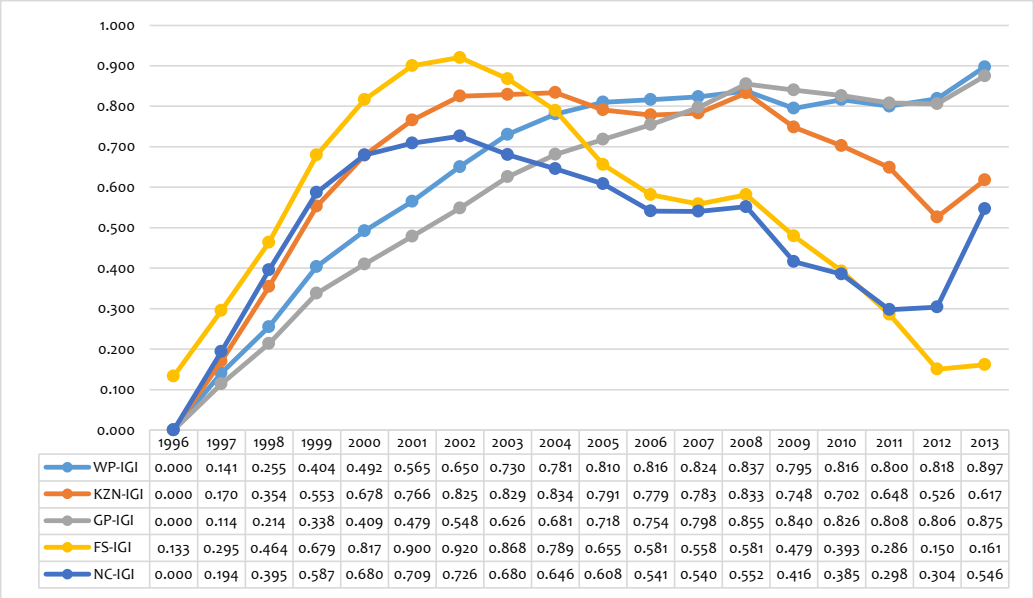


	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Inverted_EPR - IGI	0.416	0.575	0.584	0.535	0.517	0.660	0.840	0.921	0.953	0.844	0.552	0.353	0.322	0.319	0.393	0.336	0.245	0.274
Non-Inverted_EPR- IGI	0.148	0.292	0.498	0.734	0.850	0.820	0.765	0.682	0.619	0.599	0.621	0.661	0.624	0.408	0.278	0.157	0.157	0.306
IGI_NC	0.000	0.194	0.395	0.587	0.680	0.709	0.726	0.680	0.646	0.608	0.541	0.540	0.552	0.416	0.385	0.298	0.304	0.546

Source: NC DEDaT, Research and Development Unit calculation based on IHS Global Insight

The figure 11 above quantifies the different approaches to calculating the modified inclusiveness of growth index for the Northern Cape. Looking at the inverted approach, it's discernibly apparent that the period pre-and post-Asian (1996-2000 and 2002-2005) crisis was considerably the most exclusive for the province. Whilst shifting focus to the non-inverted methodology, the period 1999 until 2003, indicated an exclusive growth sentiment.

Figure 12: Inclusive Growth Index – South African Provinces – 1996 – 2013



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
WP-IGI	0.000	0.141	0.255	0.404	0.492	0.565	0.650	0.730	0.781	0.810	0.816	0.824	0.837	0.795	0.816	0.800	0.818	0.897
KZN-IGI	0.000	0.170	0.354	0.553	0.678	0.766	0.825	0.829	0.834	0.791	0.779	0.783	0.833	0.748	0.702	0.648	0.526	0.617
GP-IGI	0.000	0.114	0.214	0.338	0.409	0.479	0.548	0.626	0.681	0.718	0.754	0.798	0.855	0.840	0.826	0.808	0.806	0.875
FS-IGI	0.133	0.295	0.464	0.679	0.817	0.900	0.920	0.868	0.789	0.655	0.581	0.558	0.581	0.479	0.393	0.286	0.150	0.161
NC-IGI	0.000	0.194	0.395	0.587	0.680	0.709	0.726	0.680	0.646	0.608	0.541	0.540	0.552	0.416	0.385	0.298	0.304	0.546

Source: NC DEDaT, Research and Development Unit calculation based on IHS Global Insight

The figure above illustrates the computation of the modified inclusive growth index for five of the South African nine provinces, which include the three highest contributors (i.e. Gauteng (34.1%), Kwazulu-Natal (15.8%) and the Western Cape (14.0%)) to the South African GDP. With also the Free State, as the second least contributor following the Northern Cape.

Limiting the analysis to the inclusiveness indicator for 2013, it is starkly apparent that the Free State had the lowest IGI of 0.161, making it the most inclusive of the five. Whereas Gauteng and the Western Cape economies indicated non-inclusiveness or low inclusiveness degree, with an index reading of 0.875 and 0.816, respectively. The Northern Cape and Kwazulu-Natal province showed a medium degree of inclusiveness, ranging from 0.546 and 0.617, correspondingly.

5.3 Calibrating Northern Cape District Municipalities Inclusive Growth Index

Frances Baard is the most populous district in the Northern Cape, in 2013, 381 737 people resided in the District. This constituted an increase of 54 933 from 326 804 in 1996. Frances Baard is followed by the ZF Mqcawu, which has since 1996 gradually increasing, even surpassing John Taolo Gaetsewe district. The notable increases in the ZF Mqcawu population, could be construed to be from in-migration, given the economic development found in the district. Whilst Namakwa was the least populous district, with about 115 702 person living in the District during 2013.

In terms of economic activity, Frances Baard District Municipality lends itself as the largest contributor to the provincial economy, with a 38.6% stake, during 2009. Increasing to 40.3% in 2013, indicative of a solid Community Services sector found in the District. Followed closely by the ZF Mqcawu District, with a 25.1 percent contribution to the provincial economy. Whilst the smallest contributor has marginally exchanged hands between Namakwa and Pixley ka Seme

District Municipalities, with the former being the current least contributor with around 11.1% contribution.

As appropriately hinted in the heading above, this section of the report will attempt to compute the inclusive growth index for the Northern Cape District Municipalities. The computation of the index will based on the two methodological approaches explored in the preceding sections of the report. Similar to the approach undertaken in the previous sections of the report, the analysis will focus first on the comparative inclusive index advanced by Ramos et al, and thus subsequently the analysis will transcend to the modified approach, which would take a glimpse at the time-focus approach.

Table 9 and figure 13 below, quantifies the Northern Cape District Municipalities' inclusive growth indices premised on the writings of Ramos et al (2013), and that of Anand (2013). Given its historical economic dominance and the inequality levels, it is no surprise that the Frances Baard district municipality is the least inclusive of all the Municipalities in the province. Based on the comparative approach, Frances Baard District has an averaged Inclusiveness Index value of around 0.832, for the four years studied. Which is very high in a comparative context, and the alarming fact is that the District's inclusiveness index is on an upward moving trajectory. Moving from a comparatively low base of 0.68 index in 1996 to 0.933 during 2013.

Similar to the South African case, this index signifies that Frances Baard has a very low degree of inclusiveness compared to other districts. This is mostly due to a low labour absorption rate and very high income inequality, as earlier highlighted. The Frances Baard District is closely followed by the John Taolo Gaetsewe District. The district is beacon of the Northern Cape economy, housing a burgeoning Mining Sector. In 2013, the JT Gaetsewe district recorded an inclusive index of 0.56, this was on the back of a 0.55 during the financial crisis. Granted the index for the JT Gaetsewe district is considerably medium in comparison to that of the Frances Baard. However, given the developments in the district, stagnating inequality and resurging poverty levels, should send alarm bells ringing.

Table 9: Northern Cape District Municipalities' Inclusive Growth Index – 1996, 2001, 2009 and 2013

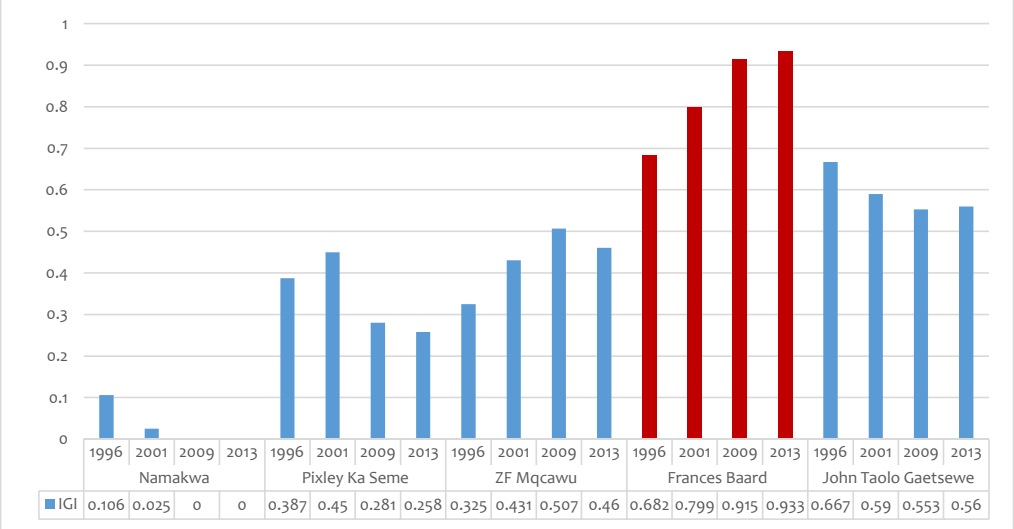
					Min-Max Normalization			
		Gini-Coefficient	Poverty Headcount	EPR Headcount	Gini-Coefficient	Poverty Headcount	EPR Headcount	**IGI**
Namakwa	1996	0.569	32948	30346	0.286	0.000	0.032	**0.106**
	2001	0.610	42193	33845	0.000	0.000	0.075	**0.025**
	2009	0.549	31838	34772	0.000	0.000	0.000	**0.000**
	2013	0.548	29937	35794	0.000	0.000	0.000	**0.000**
Pixley Ka Seme	1996	0.574	74234	41965	0.411	0.508	0.243	**0.387**
	2001	0.632	86894	43946	0.641	0.461	0.248	**0.450**
	2009	0.575	68820	43634	0.332	0.330	0.180	**0.281**
	2013	0.567	67791	44000	0.341	0.277	0.156	**0.258**
ZF Mqcawu	1996	0.557	70084	57091	0.000	0.457	0.517	**0.325**
	2001	0.616	88822	67144	0.165	0.481	0.646	**0.431**
	2009	0.576	77541	72871	0.341	0.408	0.772	**0.507**
	2013	0.562	81781	75314	0.251	0.379	0.752	**0.460**

Frances Baard	1996	0.565	103281	83743	0.182	0.866	1.000	**0.682**
	2001	0.624	139208	87749	0.397	1.000	1.000	**0.799**
	2009	0.608	143918	84124	0.745	1.000	1.000	**0.915**
	2013	0.593	166746	88367	0.800	1.000	1.000	**0.933**
John Taolo Gaetsewe	1996	0.598	114185	28584	1.000	1.000	0.000	**0.667**
	2001	0.644	116783	29501	1.000	0.769	0.000	**0.590**
	2009	0.629	97909	38184	1.000	0.589	0.069	**0.553**
	2013	0.604	99003	44957	1.000	0.505	0.174	**0.560**

Source: NC DEDaT, Research and Development Unit calculation based on IHS Global Insight

In comparative terms, the Namakwa, ZF Mqcawu and Pixley Ka Seme District Municipalities have the "more" inclusive growth outcomes, with inclusive growth index of 0.106, 0.325 and 0.387, respectively. Interesting to note that ZF Mqcawu and Pixley Ka Seme, have experienced mixed fortunes. With the former's inclusive index increasing, thus gravitating towards the moderately inclusive growth, at 0.460 index in 2013.

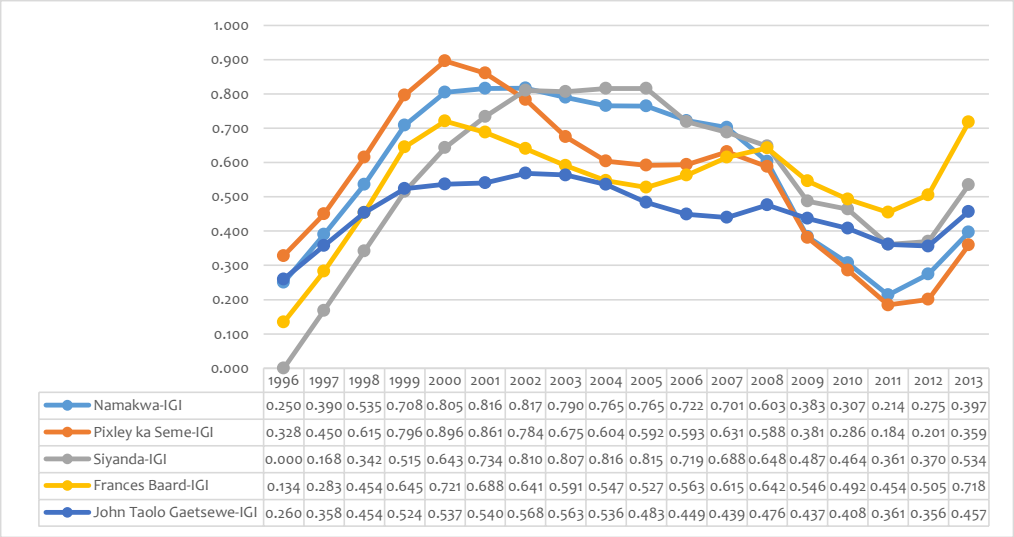
Figure 13: Northern Cape District Municipalities –Inclusiveness Index – 1996-2013



Source: NC DEDaT, Research and Development Unit calculation based on IHS Global Insight

Whilst the latter has noted shifts in terms of the inclusiveness measure, shifting from a moderate inclusiveness to a highly inclusiveness growth over the four years examined. In 2013, the Pixley Ka Seme District recorded its lowest inclusive growth index (at 0.258), which conversely implies that the district was in its highest inclusive growth for the period investigated.

Figure 14: Northern Cape District Municipalities' –Modified Inclusiveness Index – 1996-2013



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Namakwa-IGI	0.250	0.390	0.535	0.708	0.805	0.816	0.817	0.790	0.765	0.765	0.722	0.701	0.603	0.383	0.307	0.214	0.275	0.397
Pixley ka Seme-IGI	0.328	0.450	0.615	0.796	0.896	0.861	0.784	0.675	0.604	0.592	0.593	0.631	0.588	0.381	0.286	0.184	0.201	0.359
Siyanda-IGI	0.000	0.168	0.342	0.515	0.643	0.734	0.810	0.807	0.816	0.815	0.719	0.688	0.648	0.487	0.464	0.361	0.370	0.534
Frances Baard-IGI	0.134	0.283	0.454	0.645	0.721	0.688	0.641	0.591	0.547	0.527	0.563	0.615	0.642	0.546	0.492	0.454	0.505	0.718
John Taolo Gaetsewe-IGI	0.260	0.358	0.454	0.524	0.537	0.540	0.568	0.563	0.536	0.483	0.449	0.439	0.476	0.437	0.408	0.361	0.356	0.457

Source: NC DEDaT, Research and Development Unit calculation based on IHS Global Insight

Limiting the analysis to the inclusiveness indices during the two notably periods of economic crises, which were the 2001 Asian crisis and the 2008/09 Global financial crisis. It is safe to concede that there is a stark contrast between the two periods of crises. During the 2001 crisis, Namakwa and Pixley Ka Seme recorded unprecedentedly high index point (0.816 and 0.861, respectively). Meaning there was low inclusiveness in the respective economies. Whilst in apparently different scenario, the 2009 crisis, meant the opposite was true for the two District Municipalities. They recorded the lowest index points, with Namakwa registering 0.383, whilst Pixley Ka Seme 0.381. The 2009 inclusiveness index offers a truer picture of the scenario on the ground, given the stagnating inequality and lowering poverty levels for the two Municipalities.

6. Concluding Remarks

This report undertook a two-fold approach, first exploring growth-poverty dichotomy through the use of pro-poor measures. In order to gauge the relationship between growth and poverty in the Northern Cape, with regards to whether the poor are advantaged or otherwise. And secondly, has attempted to quantify inclusive growth index, which seemingly the buzz word in the realm of development economics, of late. What has been discernible is the fact that the four measures of pro-poorness fail to find uniformity, as to whether the province growth has benefited the poor or the "nouveau riche". To provide credence to the postulation that no uniformity is realised using the four measures, the following are high-level outcome of each.

- *Poverty Bias of Growth*
  - Based on this measure of pro-poor growth, the Northern Cape has highly favoured the rich, with only periods of recession acceding to pro-poor biasness.
- *Growth Elasticity of Poverty*

    - No intrinsic establishment of pro-or-anti poorness, based on the results computed using this measure.
- *Pro-poor Growth Index*
    - Based on the index the Northern Cape could be construed moderately pro-poor (based on the averaged 0.68 index points of the period analysed).
- *Poverty Equivalent Growth Index*
    - The premise of the ***PEGI*** is that it should outwit growth to be considered pro-poor, however, barring the recession period growth has outpaced it.

Thus, due the ambiguity in the results of the pro-poor measures of growth, the discourse in the realm of developmental economics and public policy, has mutated towards inclusivity (i.e. the inclusiveness of growth) and the quantification thereof. Whilst, according to Fourie (2014: 02-03) the concept of inclusive growth is used only intuitively and rather loosely, by both Policy-makers, Government bureaucrats in an attempt to justify proposed policy mechanisms and rationalisation thereof. And furthermore Fourie (2014) insists that inclusive growth is not utilised as a more precise analytical tool to guide policy design.

Thus the latter is where this article endeavoured to place itself in. That is, to offer credence to "inclusive-growth rhetoric", through the quantification of an index. From which weighted debated can be nestled, and it is by-in large embedded on the work of Ramos et al (2013) and that of Anand et al (2013).

Therefore it set out to quantify the Northern Cape and South Africa's inclusive growth index, in order to expedite the implementation of critical policies to ensure all ***benefit*** and ***share*** in the growth of the province and country. In sum, the measure of inclusiveness as proposed and applied by Ramos et al (2013), reveal that Gauteng and Kwa-Zulu Natal provinces have considerably high index values. Leading to the view that they have low degree of inclusive growth. Northern Cape is considerably the highly inclusive province, in South Africa based on the Ramos et al (2013) method.

Premised on the measure of inclusiveness as proposed by both Ramos et al (2013) and Anand (2013), two districts within the province have a low degree of inclusiveness (seen in their respective high index values) that is Frances Baard and John Taolo Gaetsewe and need to be central to the focus of inclusive growth.

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8. Appendix

8.1 Inclusive Growth Index by Northern Cape District Municipality

Table 8: Namakwa District Municipality

				Min-Max Normalization			
	Gini-Coefficient	Poverty Headcount	EPR Headcount	Gini-Coefficient	Poverty Headcount	EPR Headcount	Namakwa-IGI
1996	0.569	32948	30346	0.3808	0.3691	0.0000	0.2500
1997	0.585	35567	30602	0.5957	0.5317	0.0425	0.3899
1998	0.592	38134	31712	0.6888	0.6911	0.2262	0.5353
1999	0.602	40093	33329	0.8189	0.8127	0.4938	0.7084
2000	0.607	41054	34324	0.8834	0.8724	0.6585	0.8047
2001	0.610	42193	33845	0.9259	0.9432	0.5793	0.8160
2002	0.615	43109	33180	0.9811	1.0000	0.4691	0.8167
2003	0.616	42582	32777	1.0000	0.9673	0.4025	0.7899
2004	0.613	42385	32658	0.9571	0.9551	0.3828	0.7649
2005	0.603	42374	33395	0.8347	0.9544	0.5047	0.7645
2006	0.594	37510	35161	0.7165	0.6524	0.7971	0.7219
2007	0.583	35745	36387	0.5618	0.5428	1.0000	0.7015
2008	0.569	34678	36047	0.3878	0.4765	0.9437	0.6026
2009	0.549	31838	34772	0.1170	0.3002	0.7326	0.3832
2010	0.542	32425	33705	0.0294	0.3367	0.5561	0.3074
2011	0.540	29197	33402	0.0000	0.1363	0.5059	0.2140
2012	0.548	27003	34673	0.1073	0.0000	0.7163	0.2745
2013	0.548	29937	35794	0.1056	0.1822	0.9019	0.3965

Source: NC DEDaT, Research and Development Unit calculation based on IHS Global Insight

Table 9: Pixley *ka* Seme District Municipality

				Min-Max Normalization			
	Gini-Coefficient	Poverty Headcount	EPR Headcount	Gini-Coefficient	Poverty Headcount	EPR Headcount	Pixley ka Seme-IGI
1996	0.574	74234	41965	0.1818	0.4902	0.3123	0.3281
1997	0.593	78569	41804	0.4156	0.6553	0.2787	0.4498
1998	0.602	82838	42889	0.5217	0.8178	0.5047	0.6147
1999	0.614	83965	44564	0.6752	0.8607	0.8535	0.7964
2000	0.624	84868	45268	0.7944	0.8951	1.0000	0.8964
2001	0.632	86894	43946	0.8861	0.9722	0.7248	0.8609
2002	0.639	87624	42296	0.9696	1.0000	0.3812	0.7835
2003	0.641	84639	41134	1.0000	0.8864	0.1392	0.6751
2004	0.640	83081	40465	0.9854	0.8271	0.0000	0.6041
2005	0.633	81669	40967	0.8970	0.7733	0.1046	0.5916
2006	0.624	73505	42963	0.7977	0.4625	0.5201	0.5933
2007	0.612	71030	44692	0.6437	0.3683	0.8800	0.6306
2008	0.597	71415	44871	0.4635	0.3829	0.9173	0.5878
2009	0.575	68820	43634	0.1977	0.2841	0.6598	0.3805
2010	0.565	70796	42494	0.0763	0.3593	0.4225	0.2860
2011	0.559	65965	42277	0.0000	0.1754	0.3772	0.1842
2012	0.566	61357	42983	0.0788	0.0000	0.5242	0.2010
2013	0.567	67791	44000	0.0973	0.2450	0.7359	0.3593

Source: NC DEDaT, Research and Development Unit calculation based on IHS Global Insight

Table 10: ZF Mqcawu District Municipality

				Min-Max Normalization			
	Gini-Coefficient	Poverty Headcount	EPR Headcount	Gini-Coefficient	Poverty Headcount	EPR Headcount	Siyanda-IGI
1996	0.557	70084	57091	0.0000	0.0000	0.0000	0.0000
1997	0.576	73996	58355	0.2561	0.1800	0.0693	0.1685
1998	0.586	78975	61226	0.3895	0.4091	0.2269	0.3418
1999	0.599	82202	64923	0.5582	0.5576	0.4298	0.5151
2000	0.608	84882	67396	0.6839	0.6809	0.5655	0.6434
2001	0.616	88822	67144	0.7877	0.8621	0.5517	0.7338
2002	0.627	91818	66175	0.9325	1.0000	0.4985	0.8102
2003	0.632	90759	65634	1.0000	0.9513	0.4688	0.8066
2004	0.632	91337	65653	0.9998	0.9779	0.4698	0.8158
2005	0.626	91078	67278	0.9214	0.9659	0.5590	0.8154
2006	0.619	82466	70927	0.8276	0.5697	0.7593	0.7188
2007	0.608	80028	73869	0.6855	0.4575	0.9207	0.6878
2008	0.596	80594	74296	0.5154	0.4836	0.9441	0.6476
2009	0.576	77541	72871	0.2530	0.3431	0.8660	0.4873
2010	0.567	79901	71758	0.1343	0.4517	0.8049	0.4636
2011	0.561	74519	72064	0.0581	0.2041	0.8216	0.3612
2012	0.566	72131	73522	0.1137	0.0942	0.9017	0.3698
2013	0.562	81781	75314	0.0652	0.5382	1.0000	0.5344

Source: NC DEDaT, Research and Development Unit calculation based on IHS Global Insight

Table 11: Frances Baard District Municipality

				Min-Max Normalization			
	Gini-Coefficient	Poverty Headcount	EPR Headcount	Gini-Coefficient	Poverty Headcount	EPR Headcount	Frances Baard-IGI
1996	0.565	103281	83743	0.0000	0.0000	0.4020	0.1340
1997	0.583	115509	83948	0.2369	0.1927	0.4191	0.2829
1998	0.594	124702	86573	0.3865	0.3375	0.6368	0.4536
1999	0.608	132147	89926	0.5643	0.4548	0.9150	0.6447
2000	0.617	134121	90950	0.6765	0.4859	1.0000	0.7207
2001	0.624	139208	87749	0.7644	0.5661	0.7344	0.6882
2002	0.633	144301	83649	0.8812	0.6463	0.3943	0.6405
2003	0.640	143613	80766	0.9816	0.6355	0.1551	0.5907
2004	0.642	144030	78897	1.0000	0.6421	0.0000	0.5473
2005	0.640	140036	79269	0.9714	0.5791	0.0309	0.5271
2006	0.635	132248	82687	0.9176	0.4564	0.3145	0.5628
2007	0.629	131386	85762	0.8332	0.4428	0.5696	0.6151
2008	0.621	139785	86347	0.7332	0.5752	0.6181	0.6421
2009	0.608	143918	84124	0.5653	0.6403	0.4337	0.5464
2010	0.601	149514	82231	0.4725	0.7285	0.2766	0.4925
2011	0.595	147510	82204	0.3917	0.6969	0.2744	0.4543
2012	0.596	144764	84356	0.4096	0.6536	0.4529	0.5053
2013	0.593	166746	88367	0.3672	1.0000	0.7857	0.7176

Source: NC DEDaT, Research and Development Unit calculation based on IHS Global Insight

Table 12: John Taolo Gaetsewe District Municipality

				Min-Max Normalization			
	Gini-Coefficient	Poverty Headcount	EPR Headcount	Gini-Coefficient	Poverty Headcount	EPR Headcount	John Taolo Gaetsewe-IGI
1996	0.598	114185	28584	0.0000	0.7538	0.0257	0.2598
1997	0.612	117657	28151	0.2103	0.8629	0.0000	0.3577
1998	0.619	122020	28812	0.3217	1.0000	0.0393	0.4536
1999	0.630	120934	29986	0.4966	0.9659	0.1092	0.5238
2000	0.637	117589	30518	0.6094	0.8608	0.1408	0.5369
2001	0.644	116783	29501	0.7045	0.8354	0.0803	0.5400
2002	0.653	116673	28617	0.8460	0.8319	0.0277	0.5685
2003	0.661	112421	28408	0.9764	0.6983	0.0153	0.5633
2004	0.663	108582	28647	1.0000	0.5777	0.0295	0.5357
2005	0.661	101766	29949	0.9796	0.3635	0.1070	0.4833
2006	0.657	95500	32686	0.9097	0.1665	0.2698	0.4486
2007	0.650	92840	35479	0.7987	0.0829	0.4361	0.4392
2008	0.641	97004	37384	0.6649	0.2138	0.5494	0.4760
2009	0.629	97909	38184	0.4714	0.2422	0.5970	0.4368
2010	0.618	98622	39009	0.3124	0.2647	0.6461	0.4077
2011	0.607	96609	40573	0.1423	0.2014	0.7392	0.3609
2012	0.610	90201	43107	0.1782	0.0000	0.8899	0.3560
2013	0.604	99003	44957	0.0938	0.2766	1.0000	0.4568

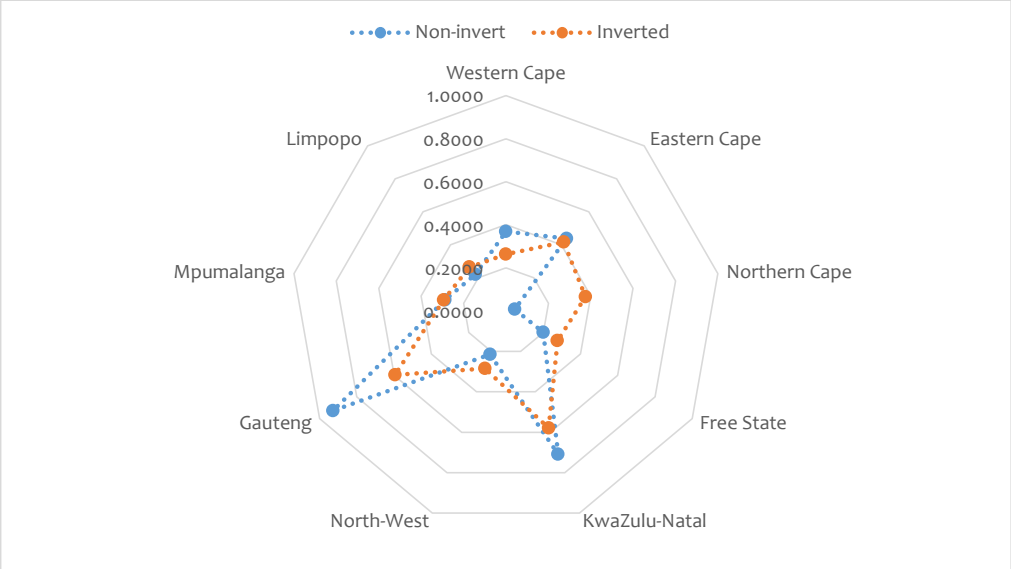
Source: NC DEDaT, Research and Development Unit calculation based on IHS Global Insight

8.2 Computing Inclusiveness of Growth in the South African Province

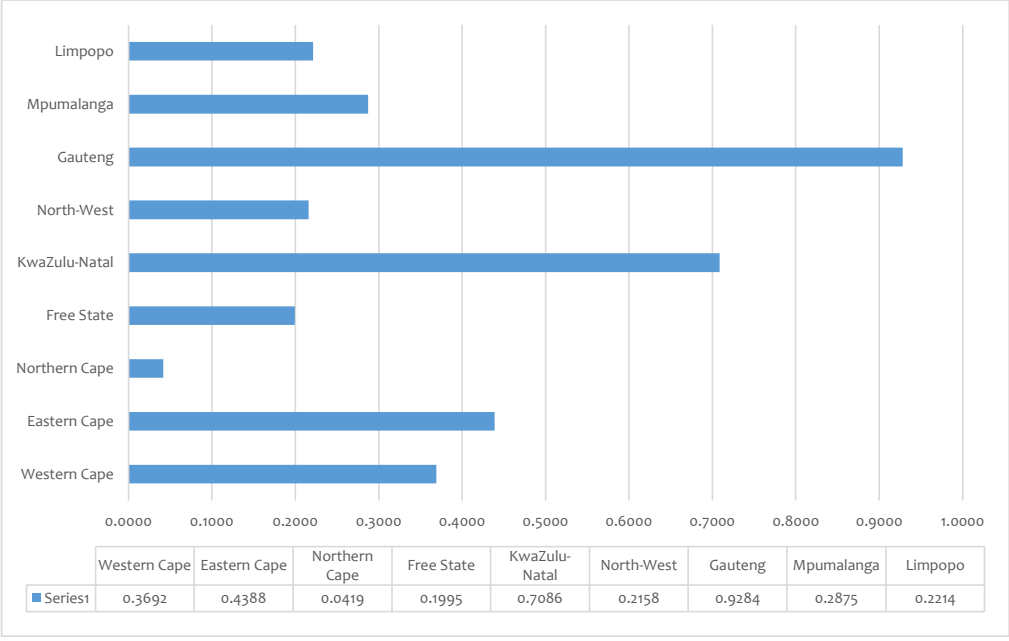
	Non-invert	Inverted	Differenced
Western Cape	0.3692	0.2636	0.1056

Eastern Cape	0.4388	0.4170	0.0218
Northern Cape	0.0419	0.3752	-0.3333
Free State	0.1995	0.2766	-0.0770
KwaZulu-Natal	0.7086	0.5791	0.1295
North-West	0.2158	0.2848	-0.0690
Gauteng	0.9284	0.5951	0.3333
Mpumalanga	0.2875	0.2934	-0.0059
Limpopo	0.2214	0.2647	-0.0432

Source: NC DEDaT, Research and Development Unit calculation based on IHS Global Insight



Source: NC DEDaT, Research and Development Unit calculation based on IHS Global Insight



Source: NC DEDaT, Research and Development Unit calculation based on IHS Global Insight