



treasury

Department of  
Treasury  
FREE STATE PROVINCE



---

ECONOMIC ANALYSIS DIRECTORATE  
Staff Working Paper Series  
February 2016

**Evaluating Poverty Incidence and Inequality Nexus in the Free State Province:  
A Quantitative Analysis**

G.G Mashibini and O.S. Omshoro-Jones



---

**NOTE:** This Working Paper should not be reported representing the views of Free State Provincial Treasury (FSPT) and/or Economic Analysis Directorate (EAD). All expressed views are those of the author based on critical analysis, intellectual insights and applicability of theories and empirics supported by available data / information. The authors views do not necessarily reflect those of the FSPT or EAD.

---



---

#### Recommended Citation

Mashibini, G. G., and Omoshoro-Jones, O.S. (2016). "Evaluating Poverty Incidence and Inequality in the Free State: *A Quantitative Analysis*", Economic Analysis Staff Working Paper No.6, Free State Provincial Treasury, Bloemfontein: South Africa.

© Free State Provincial Treasury: Economic Analysis Directorate, 2016

Address: 11<sup>th</sup> Floor, 55 Elizabeth Street, Provincial Government Building, Free State, South Africa  
Telephone: +27 (051) 405 4065 / 4961  
Internet: <http://www.treasury.fs.gov.za>  
Fax: +27 (051) 405 4230

All right reserved.

*For citation, reprint in the form of a different publication and reproduction either in printed or electronic version, in whole or in part, is permitted only with the explicit written authorisation of the FSPT or the author(s). Economic Analysis Directorate's objectives towards the fiscal and economic policy design and implementation in the Free State Province is available from the FSPT website, [http://www.treasury.fs.gov.za/?page\\_id=1531](http://www.treasury.fs.gov.za/?page_id=1531) [or] intranet: <http://www.dot.fs.gov.za/EconomicAnalysis.html>*

## CONTENTS

1. INTRODUCTION .....	4
2. REVIEW OF LITERATURE.....	5
2.1. Economic Theory and Empirical Evidence: Interrelationships between Economic Growth, Poverty and Inequality.....	5
2.2. Evidence of Increasing Poverty and Inequality in South Africa .....	8
3. METHODOLOGY.....	11
3.1. Data Source .....	11
3.2. Applied Quantitative Techniques: Measuring Poverty Incidence And Inequality.....	11
4. EMPIRICAL RESULTS AND DISCUSSION .....	14
4.1. Decomposing Poverty Rate in the Free State.....	14
4.1.1. Analysing the extent of Poverty Rate using Minimum (income) Thresholds.....	16
4.1.2. Analysing the extent of Poverty Rate using Poverty Gap.....	16
4.1.3. Changing Poverty Rate in the Free State ? Evidence from Sectoral Decomposition.....	17
4.1.4. Using Qualitative Method to Analyse Poverty in the Free State.....	19
4.2. How wide is the Inequality Gap in the Free State?.....	24
4.2.1. Analysing Inequality Gap: One-Stage Theil-T Decomposition and Gini Coefficient Technique .....	26
4.2.2. Other Measures of Inequality Gap: Lorenz Curve, Gini Coefficient and Palma Ratio.....	30
5. CONCLUSION AND RECOMMENDATION .....	34
REFERENCES .....	38
TECHNICAL APPENDIX .....	40
APPENDIX A: TABLES.....	40

## LIST OF TABLES

Table 1: Poverty gap rate (from upper poverty).....	17
Table 2: Poverty Regional Decomposition .....	19
Table 3: Human Development Index .....	20
Table 4: Types of Social Grants .....	23
Table 5: Relative Salaries .....	25
Table 6: Comparisons of Racial Inequality from 1996 to 2014 - Gini coefficient.....	26
Table 7 : One-Stage Inequality Decomposition by Theil- $T$ .....	28
Table 8: Decomposed Theil T-Indices Across Local Municipalities / Districts in Free State.....	28
Table 9: Municipal Contributions to District Theil Indices .....	29
Table 10: Population and Income Share .....	31
Table 11: District Decile Income Shares.....	32
Table 12: Palma Ratio and Gini by District Municipality .....	34
Table 13: Estimated Poverty Line .....	40
Table 14: Poverty Measures by Province.....	40
Table 15: District Poverty Estimates .....	40
Table 16: Closing the Gap .....	41
Table 17 : Qualitative Poverty Measures .....	42
Table 18: Disparity ratios – Comparing Mangaung Metro to other Municipalities.....	42
Table 19: Number of Income Categories, 2014.....	43

## LIST OF FIGURES

Figure 1: Snapshot of F.S poverty rates, 2014.....	15
Figure 2: Well Being Indicators Data source: Global Insight (2015), Own illustration.....	21
Figure 3: Asset Ownership .....	22
Figure 4: Households by Income Category: Comparing 2006 and 2014 .....	26
Figure 5: Gini Coefficient vs Theil Statistic for Free State.....	27
Figure 6: Lorenz Curve: District Municipality In 2014.....	30
Figure 7: Number of households by income category.....	33

## ACRONYMS

DM	District Municipality
FPL	Food poverty line
GDP	Gross Domestic Product
HC	Head Count
HDI	Human development Index
LBPL	lower-bound poverty line
NDP	National Development Plan
PG	Poverty Gap
UBPL	Upper-bound poverty line
WHO	World Health Organization

# Evaluating Poverty Incidence and Inequality Nexus in the Free State Province: A Quantitative Analysis

Mashibini, G.G<sup>1</sup>, and Omoshoro-Jones, O.S<sup>2</sup>.

## Abstract

---

At provincial level, Free State has the highest unemployment rate (StatsSA) at 36%, while both poverty incidence and inequality remains relative high at 22% (headcount ratio) and 0.62 respectively. Unquestionably, the deteriorating welfare and socioeconomic conditions in the province are directly linked to the ensuing triple challenges. Although, in the extant literature, large number of studies have been devoted to assess the impact of rising unemployment rate on output -, income -, and total factor productivity growth in SA, in spite of the inter-relationship between unemployment rate, poverty incidence and inequality, studies evaluating this nexus are few. this paper contribute to existing literature exploring the poverty-inequality nexus by examining the extent of poverty severity and inequality in a localised region, in this case, the Free State. Specifically, this study seeks to identify the possible factors driving high poverty rate and inequality in the province. To understand the multi-dimensional characteristics of poverty in Free State, in contrast to previous studies, we decomposed poverty into: (i) headcount ration, (ii) poverty severity and (iii) poverty gap, as well as employed arrays of inequality measuring ratios such as, Theil Index, Lorenz curve, Gini coefficient and Palma ratio to examine the inequality gap at microeconomic level. In so doing, our analysis covered both quantitative (income) and qualitative (human-index) techniques. Adding to this, we evaluates intra and inter contributions of both poverty and inequality among district municipalities. Empirical results from all the three composite index of poverty suggests that poverty incidence and severity in Free State have decline at an excruciatingly slow pace since 1996, however, this decline is not characterized as a sharp decline or being dramatic. Second, at district level, poverty severity is substantially high in rural areas than urban in Free State. For example, using the food poverty line as a benchmark, poverty incidence is the highest in Thabo Mofutsanyane (at 25%), followed by Lejweleputswa (24.5%), Fezile Dabi (21.7%), compared to 18.6% in Mangaung (metropolitan). Third, income distribution shows regional imbalance of wealth and income driven by labour market structure – more capital intensive and high skill oriented. Fourth, direct comparison of income per capita of Whites and Africans shows is characterized by widening income differential such that the minority (Whites) earned significantly more than the African Blacks (the majority). On spatial distribution, households living in Mangaung typically earn twice more than those in Thabo Mofutsanyane. further decomposition of inequality by inter and intra-regional effects shows that income inequality is driven by income distribution bias in between districts. it is evident that income inequality gap between the affluent and poor households in Free State is shrinking gradually, with the poor households (bottom decline) moving upward the inequality spectrum, while the rich households are shifting downward towards the middle of the spectrum.

JEL Classification: **H53, J08, P35,P36**

Keywords:

---

---

<sup>1</sup>Policy Analyst, Modelling and Forecasting Sub-directorate, Economic Analysis Directorate, Free State Provincial Treasury. Email: [mashibig@treasury.fs.gov.za](mailto:mashibig@treasury.fs.gov.za), Tel: +27 51 405 4254 / +27 51 405 4961

<sup>2</sup> PhD student, Department of Economics and Econometrics, University of Johannesburg  
Snr, Econometrician: Modelling and Forecasting Sub-directorate, Economic Analysis Directorate, Free State Provincial Treasury. Email: [yinkaoj@treasury.fs.gov.za](mailto:yinkaoj@treasury.fs.gov.za), Tel: +27 51 405 4065 / +27 51 405 4961

## 1. INTRODUCTION

Poverty reduction, employment creation, eradicate inequality and maintain a sustainable growth forms the fundamental goal of any government, essentially to achieve stability, build human capital, attract foreign investment, create high output and income growth. In the absence of these socioeconomic priorities in any economy leads to instability, insufficient economic, social and human development. It is well documented that in South Africa's poverty levels, inequitable income distribution and unemployment rate is excessively high with (in)direct negative influence which continues to exacerbates the prevailing socioeconomic conditions in the country. For instance, recent data from StatsSA shows that more than 45% of South African population lived in poverty (using an upper bond poverty line) in 2011 while 20.2% (using a food poverty line) in lived in extreme poverty. While there is persistent correlation in literature between poverty and the following factors such as: race, gender, rural or urban divide, access to basic services, unemployment, age, and household size.

Many studies that explore the poverty-inequality-unemployment nexus generally linked the root-cause of these socioeconomic dilemma in South Africa to several factors such as the past Apartheid regime that adopts a draconian law of racial segregation; evolution of the labour market becoming capital – and skill –intensive where labour demand for highly skill workers is high relative to oversupply of unskilled labour; the structural nature of unemployment rate, labour market rigidities, amongst others.

Unquestionably, the deteriorating welfare and socioeconomic conditions in the province are directly linked to the ensuing triple challenges. Although, in the extant literature, large number of studies have been devoted to assess the impact of rising unemployment rate on output-, income-, and total factor productivity growth- in SA, in spite of the inter-relationship between unemployment rate, poverty incidence and inequality, studies evaluating this nexus are few. Furthermore, at regional level, while large body of literature examine the link between poverty incidence and inequality adequately in South Africa, few studies focuses on sub-national level due to the unavailability of data and hardly (if ever) disaggregate to municipal levels. It is worth mentioning that, despite the existing prolific and extensive research work on the impact of unemployment rate on SA, little attempt have been made to evaluate the extent of poverty severity and inequality at the national and provincial level.

Against this backdrop, this paper contribute to existing literature exploring the poverty-inequality nexus by examining the extent of poverty severity and inequality in a localised region, in this case, the Free State. Following an extensive review of extant studies, to the best of our knowledge, at regional and international level, this is the first study to attempt an in-depth quantitative analysis on the extent of poverty rate and inequality gap in the Free State.

In this paper, to close the existing research gap on regional assessment of poverty and inequality gap, our empirical assessment explicitly focused on the empirical objective of understanding the multi-faceted dimension of poverty and inequality, as well as, identify reinforcing factors responsible for acute poverty incidence including unequal income distribution in a specific region, in this case, Free State. Specifically, we seek to answer the following policy-related questions: First, what is the extent of poverty severity and inequality in the Free State? Second, is there any change since 1994 in poverty and inequality gap? If so, what are the factors behind the observed changes? Third, what are the factors underlying the persistently high poverty rate and inequality in Free State? Finally, is there any way out, that is, what are feasible policies that the policy makers can implement?

To answer the posed research questions, we employed a multiple pronged estimation techniques was employed to examine the poverty-inequality nexus in the Free State. First, to fully understand the multi-

dimensional features of poverty, and assess the extent of poverty incidence using the Foster-Greer-Thorbecke (FGT) Index technique by decomposing poverty rate further and estimated as: (i) head count ratio, (ii) poverty severity and (iii) poverty gap. Second, to trace the source of contributing factors driving high poverty rate, and the evolving pattern of poverty in the province, we estimated the additive features of poverty rate as intra-regional (changes in poverty within districts), intra-regional (changes in poverty as a result of changes in population share of districts) and intra-regional effects (changes in poverty as a result of interaction between inter-regional and intra-regional effects (c.f. Ravallion and Huppi, 1991). Next, we utilise variety of inequality measurement, in particular Thiel-T Index, Palma ratio, Lorenz Curve and Gini coefficient to systematically evaluate the existing inequality gap between the affluent (high income) household and their poor(er) counterparts. Using census and poverty dataset published by Statistic South Africa (hereafter StatsSA), our analytical and comparative assessment covered three periods, which are: 1996, 2005 and 2014.

Our empirical results from all the three composite index of poverty suggests that poverty incidence and severity in Free State have decline at an excruciating pace since 1996, however, this decline is not characterized as a sharp decline or being dramatic. This inference is supported by the substantial decline in poverty rate “between periods”. For instance, the estimated percentage change in poverty between 1996 and 2005 was roughly -5%, compared to the 12 percent fall in poverty incidence between 2005 and 2014. Noticeably, the apparent decline in poverty incidence could be attributable to the implemented fiscal policy of using a progressive tax system to re-distribute income from rich households to the poor in form of conditional grants (social benefits), which have reduce the rate of extreme poverty in SA (cf. World Bank, 2014), nonetheless, poverty rates remains relatively high due to intra-regional effects more than inter-regional factors.

The remainder of this paper is organised as follows. Section 2 discusses the theoretical underpinnings and empirical evidence on the interrelationship between economic growth, poverty and inequality, in addition a synoptic review of the relevant literature is provided. Next section outline the methodological techniques employed to decomposed poverty rate and investigate the extent of inequality gap at macro (municipal) and micro level (households) in the Free State. Section 4 discusses the empirical results and motivate these findings, while conclusion and policy recommendation for policy purpose is presented in Section 5.

## 2. REVIEW OF LITERATURE

### 2.1. Economic Theory and Empirical Evidence: Interrelationships between Economic Growth, Poverty and Inequality<sup>3</sup>.

Characteristically, poverty is a multi-dimensional social phenomenon to quantify and adequately assessed because of the unquantifiable physiological effect it exert ion the poor. Intuitively, lack of access to a source of income such as, via remunerative employment or social grant, directly amplify the deleterious impact of poverty incidence on the poor as result of low level of consumption, nutrition and inability to meet basic needs. Theoretically, White and Anderson (2001) maintained that changes in income distribution induce larger effects on poverty severity and depth. By implication, poverty

---

<sup>3</sup> See Hull (2009), Islam (2004), Ames et al. (2001) and Khan (2001) provide excellent theoretical arguments and cross-country empirical evidence establishing the link between economic growth, poverty, inequality, employment and human capital accumulation via education/training.

increases as inequality (income gap) widens, as gains from economic growth is lesser for the poor than that of the rich (see Wodon, 1999; Lombardo, 2008; Deolalikar, 2002), as well as, if the economic growth does translate into employment opportunities (see Islam, 2004).

In this context, the general consensus in the literature studying the economic growth-poverty-inequality nexus, that, foremost, economic growth is the single most important factor to reduce poverty (see, e.g. Hull, 2009; Ames et al. 2001), nonetheless, the adverse effect of economic growth on inequality (income per capita) because increase in economic growth raises output productivity, which in turn, create an effective demand for labour in the capital-intensive productive sector, typically employing few high skilled workers relative to the excess supply of labour from the large number of low skilled or semi-skilled workers. The wage disparity between the highly skilled workers and their low-skilled counterparts, as well as, the segmented labour market cause an increased in growth to widen income inequality gap. As such, the inverse relationship between economic growth and inequality exacerbates the complexity of disentangling the interwoven relationship between employment-growth-inequality nexus.

Then again, in cross-country studies, ample empirical evidence has established the positive correlation between economic growth and poverty, as well as, the inverse effect of the latter on inequality (see World Bank, 2002). For example, while the empirical works of Kray (2002); Deaton and Dreze (2001); Bhagawati (2001); Ravallion and Datt, 1996,2002); Jain and Tendulkar (1995), Agrawal (2008), Kolawole et al. (2015) and Fosu (2009) – all found that higher economic growth reduces poverty by inducing higher employment and higher real wages. In the same vein, Islam (2004), Alesina and Rodrik (1994), Alessina and Perotti, (1996), Ahituv and Moav (2003) Kim (2014), and Ncube, et al. (2013) provide concrete evidence that income inequality can undermine economic growth, in effect, diminishing the poverty reducing effect of growth (e.g., see, Kakwani, 1993; Bourguignon, 2004). Whereas, other empirical studies examining the income inequality-economic growth nexus found no diminishing effect of inequality on economic growth (see, e.g. Kray, 2002; Lee and Roemer, 1998; Panizza, 2002). In the policy circle, this mixed evidence on the adverse effect of economic growth on income inequality present a difficult strategy to tackle poverty and inequality simultaneously.

Arguably, the missing point in some of the studies on poverty-inequality-economic growth nexus, is the indistinguishable definition of inequality in itself, which can relate to income inequality or skill inequality. While, an increased in economic growth can lead to higher wages with a positive effect on income per capita, thereby widening income inequality gap, it is possible that aggregate inequality is influenced the type of employment generated as a result of the economic growth, as well as, the sector where such employment opportunities lies. For instance, according to labour market segmentation theory, labour markets (especially in developing countries) are usually segmented between “more productive” and “less productive” jobs sectors, while, the former sector is more capital-intensive, higher rents and demand highly skilled workers (e.g. manufacturing), and the latter sector is more labour intensive, pay lower rents with excess supply of low and/or semi-skilled workers (e.g. agriculture). According to labour market segmented models, access to more productive job sectors is limited by job rationing due to high institutional wages (i.e. unionization) leading to employment in low job sector since some workers cannot afford to remain unemployed.

In the literature, one profound consensus is that economic growth alone is insufficient to reduce poverty but other coperant factors such as improved governance, access to credit, removal of barriers to labour market, implementation of public employment programmes, increased literacy and education to build

human capital, intensive infrastructure investment<sup>4</sup>, land reform, pro-poor public expenditure and so on (see ILO, 2012; Stern, 2003, Ames et al. 2001, Van der berg, 2010). In particular, on infrastructure investment, empirical evidence have confirmed the reducing effect of high infrastructure investment on poverty and economic growth (see, e.g. Calderon and Sérvén, 2004; Corong et al. 2012), on reducing inequality (Fereira, 1995; Lopez, 2003; Estache and Fay, 1995) and income per capita (see Chong and Calderon, 2001; Romp and de Haan, 2007)<sup>5</sup>.

Evidently, lack of infrastructure creates structural bottle necks that hinder sustainable economic growth and reduction in poverty ( see, Sahoo et al. 2010; World Bank, 2014). Likewise, Ramey and Ramey (1995) emphasized the importance of private sector participation in the economy by arguing that capital accumulation by the private sector drives growth, as such, crowding out of private sector would impose adverse effect on economic growth and employment (e.g. see, Behar and Mok, 2015; Stepanyan et al. 2015; Aysu et al. 2011, and Algan et al. 2002 among others). On the other hand, Hulten (1997) and Canning and Pedroni (2004) found that an over investment adversely affect economic growth by shifting investment from more productive sectors.

Secondly, some studies have shown that impact of economic growth on poverty, and inequality can manifest through sectoral composition. Purely based on labour market segmentation theory, it is logical that sizeable growth in sectors of the economy where poor is concentrated (e.g. agricultural sector) would have a significant impact on poverty compared to non-farm sectors, which tends to be mainly capital intensive (e.g. manufacturing). For instance, Growth in agricultural sectors that generates employment tends to reduce poverty, as many of the poor lives in the rural areas because income is generated to farmers, and demand for GNS increases. Various country-specific and cross-country studies have shown that growth in agriculture and tertiary sectors have major effects on reducing poverty, while growth in manufacturing sector has not (Datt and Ravallion, 1998; Thorbecke and Jung, 1996; Borguignon and Morrison, 1998). However, Hull (2009) maintained that While faster growth in agriculture may address rural poverty in the short-term, reliance on agricultural activity may also intensify output variability, which could in turn, contribute to increasing rather than decreasing poverty.

A more diversified economy with a vibrant manufacturing sector might offer the best chances for a sustainable improvement in living standards in the long run. For empirical support, Similarly, there are a strong evidence that the sectoral pattern of growth and its employment and productivity-intensities matter for poverty reduction. For instance, the result from the study of Gutierrez et al. (2007) suggests that while employment-intensive growth in the tertiary sectors is correlated with poverty reduction, employment-intensive growth in agriculture is correlated with increases in the poverty headcount. Also, Satchi and Temple (2006) reported that an increase in agricultural productivity can increase poverty while growth in the urban sectors could impose an adverse effect. On the contrary, productivity-intensive growth in agriculture is significantly correlated with poverty reduction, whether through increases in sectoral productivity or through the movement of workers into other sectors. For example, Loayza and Raddatz (2006) find that growth in unskilled intensive sectors contributes to poverty reduction. In addition, Coxhead and Warr (1995) find that increases in agricultural productivity reduce poverty, whereas, Warr (2002) found a negligible impact of agricultural productivity on poverty.

---

<sup>4</sup> For comprehensive survey of literature on infrastructure-economic growth-poverty or inequality nexus, see (2013), Pereira and Andraz (2012), Romp and de Haan (2005), Gramlich (1994), Kessides (1996), For poverty reducing and employment generating impact of public works programmes, for literature survey, see Omoshoro-Jones (2014,2015), McCord (2008), Subbarao (1996).

<sup>5</sup> For empirical studies on South Africa, see Fedderke and Garlick (2008), Fedderke and Bogetic (2006), Perkins (2005), Ngadu (2010); Gnade (2012), Kumo,(2012) and Amusa (2016).

Thirdly, many cross-country empirical studies find that countries with high economic growth are usually successful in reducing poverty, in particular those in Asian and Latin American region (e.g. see, Islam, 2004; Khan, 2001; Agrawal, 2008). In this context, rapid economic growth is a key factor to spur output growth, which in turn, creates remunerative employment. Through this channel, another consensus in the literature is that employment is the escape route out of poverty, however, the nature of employment generated, as well as, the sectors where the large proportion of the job created located are equally important (see, Hull, 2009; Ames et al. 2001).

From this viewpoint, high unemployment rate has a positive correlation with income inequality and poverty, hence, employment (creation) plays an active role between economic growth and poverty reduction. This inference suggests that government policies should support productive employment in order for economic growth to be able to reduce poverty, since such policy promotes greater participation of the poor in the labour market and production process (ILO, 2012), whilst, at the same time, allow the poor to acquire the benefit of growth. In this way, an increase in generating decent work for the low- and semi-skilled can, also has a reducing effect on income inequality (see Tregenna et al. 2008).

In a cross-country study, Islam (2004), using an empirical cross-country data, established a link between poverty reduction and employment intensity of growth, he postulate that employment has a reducing effect on poverty through five main channels in the presence of high economic growth that leads to an increased output growth and labour productivity, as such, the employed poor can graduate out of poverty due to: (i) access to labour market accompanied by an increase in demand for labour put upward pressure on wages, (ii) rise in real wages due to an increase in productivity, (iii) possibility to engage in self-employment, (iv) an increase in productivity of the poor in self-employment, and (v) an increase in the terms of exchange of the output of poor's self-employment.

On the impact of employment on poverty and inequality, two issues stands out, while employment-intensive growth can improve labour productivity of the poor, it is probable that high skilled workers, an owners of other factor of production (i.e. land and capital) could obtain larger income gain than the poor, in effect, widening income inequality gap and increasing poverty rate. Equally, Investing in labour-intensive sectors, where there is a considerable depository of low skills, or large proportion of the poor can lead to fall in labour productivity and wages, but not necessarily in poverty reduction (see, e.g. Kakwani, 2005 for Cote d'Ivoire). Evidently, the inverse relationship between labour-intensity and productivity becomes critical point for consideration in terms of public employment generating programmes.

## **2.2. Evidence of Increasing Poverty and Inequality in South Africa**

Most empirical studies investigating the impact of economic growth on South Africa economy note that higher economic growth during the post-Apartheid period, during 2000 to 2005 led to decline in poverty and unemployment, for example, Casale, Muller and Posel (2005) finds that between October 1995 and March 2003, about 1.4 million jobs were created by the South African government as result of implemented pro-poor policies, radical economic reform strategies which includes trade and capital liberalisation, and high public infrastructure investment, all these combined, spurred economic growth (see e.g. Jonsson and Subramanian, 2000; Rattsø and Stokke, 2008, Edwards, Cassim and van Seventer, 2009). Nonetheless since 2005, economic growth slowdown markedly from 5.3 percent (2005) to 0.6 percent in 2015 (IMF, 2015), while, at the same time, unemployment rate and poverty incidence have risen substantially.

Given the dwindling economic growth and shrinking employment opportunities, the only means for the national government to ameliorate negative shock of poverty on the poor is via the expansion of the social grant system, largely financed with generated tax revenue through its adopted progressive tax system. In response to the socioeconomic problems in the country, the national government have implement three anti-poverty policies<sup>6</sup> with little modicum of success, albeit, these polices were phased out given their failure as an effective policies, or panacea to socioeconomic problems they are designed to resolve. But, in 2002, the nascent democratic government introduced the Basic Income Grants (BIG) as social grant system to provide safety net for the poor. Over the years, BIG has evolved into a crucial social protection pro-poor policy to meet the increasing demand of poor as households as structural unemployment rate remains high, poverty intensifies, and inequality gap widens.

A recent cross-country study by World Bank (2014) using the Commitment to Equity (CEQ) methodology to a sample of twelve (12) middle-income countries including South Africa, to determine the effectiveness of fiscal policy in these countries, especially to identify how taxes and spending work to benefit the poor and alleviate inequality finds that the country's income re-distribution strategy using a progressive tax system that impose higher tax on the rich, has lifted about 3.6 million people out of chronic poverty, and reduces income inequality (from the high of 0.77 in 1994) to 0.59<sup>7</sup>. However, by international standards, income inequality and poverty rates in South Africa is extremely high (World Bank, 2008, 2014)<sup>8</sup>. Even though, the use of cash transfers remain a contentious issue in the academia and political circle, studies on poverty and income inequality has reported a slight decline in poverty incidence attributable to the growing cash transfer system (see Seekings et al. 2005; Hoogeveen et al. 2005; Van der berg et al. 2005; Bhorat, 2006; Bhorat et al. 2008) which is accompanied by a widening inequality gap (Leibbrandt et al. 2009, 2011).

The persistently high and inequality in the country have been, to a large extent, linked to lack of adequate education, excess supply of low- and/or-semi skills and labour market segmentation (see, e.g., McCord, 2002). Seekings and Natrass (2005) argued that income inequality and poverty would continue to rise in the absence of skill enhancing education policies to improve the growth of low wage jobs for the unskilled unemployed. Recent study examining the increasing inequality gap have shown that, in South Africa's labour market, the importance of education as a predictor of income has increased considerably, while workers with low education are becoming worsen off<sup>9</sup> due to the shift in the structure of the labour market to more capital-intensive, and highly skilled trajectory .

To this end, poverty rate, inequality and unemployment is on the rise due to severely weak economic growth, low infrastructure investment, low private sector employment, resultantly, the burgeoning proportion of the poor unemployed are increasingly depending on the social grant system as the last straw to cope with declining consumption and nutrition level, nonetheless, the use of the social grant

---

<sup>6</sup> Central to these policies is poverty reduction, job creation and fostering sustainable economic growth. These polices includes the Reconstruction and Development Programmes (RDP, 1994), Growth, Employment and Redistribution (GEAR, 1996); Accelerated and Shared Growth Initiative for South Africa (AsGISA, 2006). Recently, the National Development Plan (2012) has been adopted as a national policy document to achieve the aforementioned objectives.

<sup>7</sup> The remaining eleven (11) middle-income countries are: Armenia, Brazil, Bolivia, Costa Rica, El Salvador, Ethiopia, Guatemala, Indonesia, Mexico, Peru, and Uruguay.

<sup>8</sup> In comparison to other middle income countries such as Thailand, Argentina, Poland and Romania, South Africa has the most unequal distribution of income. On poverty, more than 31% of the population is living on/less \$2 a day. While India and Indonesia have the higher levels of poverty than South Africa both registering 69% and 46% respectively in 2010. (USAID, 2012).

<sup>9</sup> See Leibbrandt et al. (ibid)

to reduce poverty and ensure equitable distribution of income is becoming limited<sup>10</sup>. More so, it is important to note that persistently high poverty, widening inequality gap and unemployment rate, in the post-Apartheid era remain perennial problems, emerging as the top priority of the new democratic government up till now, to solve. To tackle the growing negative impact of acute poverty incidence and inequality, the national government re-focused its efforts to reduce poverty incidence and narrow inequality gap as outlined in the National Development Plan (NDP, 2012) by setting a target of eliminating all poverty below the lower bound poverty line (R443 in 2011 prices) and reducing Gini coefficient to 0.6 by 2030. Meanwhile, at provincial level, Free State has the highest unemployment rate (StatsSA, 2015) at 36%.<sup>11</sup>

Against this backdrop, this paper, focus explicitly on the Free State with the empirical objective of applying variety of poverty and inequality gap measures to study the pattern of the acutely high poverty and inequality gap existing within the province. The main aim is to gain deeper insight into the contributing factors driving poverty and income inequality, especially, along different racial line, and in the labour market. The closet empirical paper to ours, is the work of Elsenburg (2005) using the Income and Expenditure Survey (IES) of 2000 and the Labour Force Survey (LFS) of September 2000, in addition to other populations statistics are extracted from the National Census of 2001, this author examines the comparative difference between two sectors namely, agricultural and non-agricultural sectors in terms of demographic statistics, poverty -, inequality and unemployment – estimates.

Nevertheless, our study differs from that of Elsenburg (2005), since extend existing empirical work in terms of sampling period spanning from 1996 – 2014 to capture the shifts in poverty and inequality over time. Then again, this paper contribute to extant work using the Foster-Greer-Thorbecke (FGT) Index to depose poverty rate into head count ratio, poverty severity and poverty gap. In this way, following Ravallion et al. (1991), our analytical lens centers on the factors responsible for the persistently high poverty rate in Free State attributable to intra- or inter-regional factors such as migration, urbanization, and so on. Thirdly, in contrast to prior study, existing inequality gap between the rich income household and their poor(er) counterparts is assessed using estimation techniques which includes Gini coefficient, Palma ratio, and Lorenz curve for consistency and robust analysis.

Lastly, the empirical aim of this paper is more relevant to the contemporary lackluster economy condition and labour market rigidities, which combined, expose the unemployed poor to idiosyncratic shocks related to aggregate economic recession and tight financial conditions. Further, to equip the policy makers with accurate knowledge required to design and implement pro-poor policy that, not only focus on stimulating economic growth, our assessment of the poverty-inequality nexus, is anticipated to unearth useful inferences that could shape, and culminates into an effective anti-poverty policy and foster equitable skills and income.

---

<sup>10</sup> See World Bank (2014). Presently, the social grant system is a crucial policy tool that offer some form of protection to the poor to cope with the harsh reality of poverty and unemployment, however, as a risk coping tool, the effectiveness of social grants is unsustainable in the long-run (see Chibba et al. 2011).

<sup>11</sup> For cross-provincial labour data, see Table 14 in the appendix.

### 3. METHODOLOGY

#### 3.1. Data Source

The paucity of up-to-date and finely disaggregated income or expenditure data which are two main variables typically used in estimating income poverty (e.g. the Income and Expenditure Survey (IES) usually undertaken by StatsSA) do not disaggregate expenditure and earning patterns per household beyond the national and provincial levels to the local municipal (district) level, where poverty incidence is predominant and inequality is masked by undifferentiated poverty data. To achieve the pre-set research aim, in addition to the published 2008 IES survey compiled by Stats SA, other reputable alternative data source were utilised, viz: Global Insight database (provide well disaggregate data using the reported 2011 Census data published by StatsSA), several South African Reserve Bank (SARB) *Quarterly Bulletin* that is a rich source of adjusted personal income data per year<sup>12</sup>, income data based on different employment patterns, gross domestic product (GDP) growth rates and so on, for each region.

#### 3.2. Applied Quantitative Techniques: Measuring Poverty Incidence And Inequality

In the literature on poverty and inequality, the Foster, Greer and Thorbecke (1984, hereafter referred to as FGT) technique is generally to decompose poverty rate into different components in order to evaluate the extent of poverty severity in a specific set of population. The FGT is widely use due to its quantitative appeal to allow a thorough assessment of poverty incidence, as well as, provide insight into the varying contribution of different source of income to the aggregate poverty rate. In practice, the most commonly used measures of income poverty are: (i) headcount index, (ii) poverty gap, (ii) squared poverty gap. Mathematically, the FGT is computed as:

$$P_h = \frac{1}{m} \sum_{i=0}^{qp} \left[ Z - \frac{y_i}{Z} \right]^h \quad \text{Eq.1}$$

where,  $m$  represent population size,  $qp$  denotes poor population,  $y_i$  captures the average consumption/income of the poor, and  $Z$  is the poverty line. From Eq. 1, the three component of the FGT commonly used to assess the severity of poverty can be extracted and defined as the head count ratio, poverty gap ratio and squared poverty gap. First, the headcount ratio (HC) of poverty ( $P$ ) is defined as the percentage of the population for whose consumption or income,  $y$  is below the poverty line  $Z$  (also known as the subsistence minimum (see Table 1 in the appendix). As such,  $P$  is dependent on average income per capita ( $Y^*$ ) and the poverty line ( $\bar{Y}$ ), as well as, income inequality or distribution ( $D$ ). This relationship can be written as:

$$P = P(Y^*, \bar{Y}, D) \quad \text{Eq.2}$$

However, one of the shortcoming of headcount ratio as a poverty measure is associated with the inability of the measurement index to identify the "exact" distance of poor individuals below the poverty line (i.e. how far does those considered to be poor fall below the poverty line). and thus does not capture any changes in the living conditions of those already in poverty as long as they remain below the line.

---

<sup>12</sup>Note that, personal income includes current transfers from general government, Income from property, Labour remuneration and Transfers from the rest of the world.

For example, if individuals below the poverty line become poorer or relatively well-off under the poverty line, HC will remain the same. Here, the headcount index is defined as:

$$HC = \frac{qp}{m} \quad \text{Eq.2.1}$$

From Eq.2.1,  $qp$  is the total population, while  $m$  denote the population size.

The second measure of poverty considered in the exploratory analysis is the poverty gap index (PG). The PG can be mathematically assumed as:

$$PG_1 = \frac{1}{m} \sum_{i=0}^{qp} \left[ z - \frac{y_i}{z} \right] \quad \text{Eq.3.1}$$

where,  $qp$  is the total population,  $z$  is the poverty line,  $y_i$  is the total income of the population and  $m$  denote the population size.

In Eq. 3.1, the poverty gap index estimates the *mean distance* between the total population and the poverty line. This index, captures the *average distance* by which poor individuals fall below the poverty line. Alternatively, poverty gap index can be as expressed as total income or financial resources needed allocated to the poor through perfectly targeted cash transfers to alleviate poverty.

Finally, the third poverty index popularly use to analyse the severity of poverty incidence is the squared poverty gap. By definition, the squared poverty gap is generally taken as the “measure of poverty severity”, and computed by weighting poverty gap by itself, in essence, to capture the extent of inequality among the poor. This index is written as:

$$P_{sqp} = \frac{1}{m} \sum_{i=0}^{qp} \left[ z - \frac{y_i}{z} \right]^2 \quad \text{Eq.3.2}$$

On the other hand, in addition to the three poverty measures employed to capture the varying degree of poverty incidence in the Free State, to disentangle the interrelationship between poverty and inequality often masked in aggregate poverty data, in this context, adequate inequality measures such as, Theil-  $T$  index and Gini coefficient were estimated to clearly assess the extent of inequality generated by income (i.e. earned wages and salaries) differentials at micro- and macro-levels, that is, across the total population, individual households and sectors respectively.

By definition, inequality is taken as the dispersion or the concentration of income or any welfare indicator (Litchfield, 1999), as noted in the introduction, is shapes income distribution by both race and geographical locations. For example, apartheid laws reserved high skill jobs to whites and low skill jobs to non-whites. Therefore, given the impact of real wages and strong positive employment in poverty alleviation, it is necessary to compare the wages of historical privileged groups to less the privileged. In the light of the definition of inequality, both the Theil-  $T$  index and Gini coefficient are sufficient to account for income dispersion and/or welfare indicator associated with different inequality levels. These inequality measures are succinctly discuss in this section.

Firstly, the Theil Index is a member of Generalized Entropy Class (GE) of inequality indexes because it is perfectly decomposable into “*between*” and “*within*” components. Also, this index satisfy certain set of

axioms namely: first, population size independence e.g. change in income by same the proportion in every region's income does not lead to a change of the index, Second, Pigou-Dalton principle of transfers meaning that transfers from a richer to a poorer district does not reduces the value of the index. Third, mean income independence implies that the index will remained unchanged if the district's income change by the same proportion in all districts. Fourth, the symmetry which suggest swapping incomes should not lead to the change in the measure of inequality (cf. World Bank, 2004).

From this viewpoint, in this paper, the one-stage Theil decomposition is utilised to estimate the aggregate contribution of the focal municipalities (or local districts) in terms of "within" and "between" inequality spectrum. The one-stage Theil decomposition is estimated as:

$$GE_{\alpha} = \underbrace{\sum_{k=1}^d \left( \left[ \frac{y_k}{y} \right]^{\alpha} \left[ \frac{n_k}{n} \right]^{1-\alpha} \right)}_{\text{within}} \times \left[ GE_{i\alpha} + \frac{1}{\alpha^{\alpha} - \alpha} \right] * \underbrace{\left[ \left( \sum_{k=1}^d \left[ \frac{n_k}{n} \right] * \left[ \frac{y_k}{y} \right]^{\alpha} \right) - 1 \right]}_{\text{between}} \quad \text{Eq.5}$$

where relative mean and population share are raised by  $\alpha$  and  $1 - \alpha$  respectively,  $GE_j$  represent  $GE$  index of the  $j^{th}$  municipal district and values of  $GE$  measures may vary between 0 and  $\infty$ , with zero representing an equal distribution and higher value representing a higher level of inequality.

Mathematically, the "within" component represent weighted average of  $GE$  indexes for each district while the "between" is calculated  $GE$  index where actual incomes are replaced by districts means, in order to pick up variability only among districts and not within them. Most precisely,  $GE_1$  represent the Theil  $T$  index, which can be expressed as:

$$GE_1 = \frac{1}{N} \sum_{k=1}^d \left( \frac{y_k}{y} \right) \ln \left( \frac{n_k}{y} \right) \quad \text{Eq.5.1}$$

where  $y_k$  is the income of the  $k^{th}$  district,  $y$  is the total income of Free State province,  $n_k$  is the income of the  $k^{th}$ , and  $N$  is the total population of the district.

If we define one the district's Theil-  $T$  say as  $T_j$ , then Theil-  $T$  can be estimated as taking all the "within" contribution plus "between", represented as:

$$GE_1 = \left\| \left( \frac{y_j}{y} \right) * T_j + \left( \frac{y_j}{y} \right) \ln \left( \frac{\frac{y_j}{y}}{\frac{n_j}{y}} \right) \right\| \quad \text{Eq.5.2}$$

To measure inequality, the widely used Gini coefficient is applied to the income and expenditure dataset. Noticeably, the Gini coefficient measures the distribution of income and ranges from 0 (indicating equal) to 1 (which shows unequal). Although, despite the appeal of this measure in terms of its ease to compute and interpret, on the contrary, the Gini coefficient is not easily decomposable and, considered to be overly sensitive to changes in the middle of the income distribution. For example, if the poor are getting relatively poorer, the Gini tends to shows less change than alternative measures of income distribution (cf. Hoogeveen and Özler 2004). Then again, the Gini coefficient is akin to the Lorenz

curve in a diagrammatical way, because the Gini is equivalent to the area between the equidistribution line and the Lorenz curve divided by the entire area beneath the equidistribution line. Technically, the Gini coefficient is the summation of every single income differential in the population, and the coefficient is defined as:

$$Gini = \frac{1}{yn^2} \sum_i \sum_j (y_i - y_j) \quad \text{Eq. 6}$$

where,  $n$  denotes the population size,  $y$  indicates mean income,  $y_i$  represent total household income  $i$  for  $i = 1, 2, 3 + \dots k$  and  $\sum_j$  is the sum of household income  $j$  for  $j = 1, 2, 3 + \dots k$

## 4. EMPIRICAL RESULTS AND DISCUSSION

### 4.1. Decomposing Poverty Rate in the Free State

Having precisely outline the estimation procedure for our empirical analysis, the inference from all estimated indexes capturing the extent of poverty incidence and inequality at the macro- and micro-levels are thoroughly discussed in this section.

Foremost, to gain deep insight into the multi-faceted dynamics of poverty and inequality in the Free State, a notable starting point is to benchmark the focal province with others in South Africa. Thus, based on the two census surveys conducted by StatsSA in 2006 and 2011 in the country (see Table 1), it is clear that, income poverty is acutely high in provinces such as: Limpopo, Eastern Cape and KwaZulu-Natal indicating a large proportion of population is living below the lower bound poverty line (see Table 13 in the Appendix). Further analysis asserts that provinces with high poverty rates, ultimately are susceptible to sizeable poverty gap and severity.

[Insert Table 13 – *Estimated Poverty Line here*]

Interestingly, according to the figures in Table 1, there is a significant change in the patterns of poverty overtime across the provinces, especially in South Africa, for example, between 2006 and 2011, headcount ratio declined from 57% to 45.5%, while poverty severity improved somewhat in the same period under review, this inference suggest that a decline in poverty incidence as a result of the poorest of poor being pulled close to the poverty. It worth noting that, similar findings about fall in poverty rate have been established by large body of research (e.g. see, Hoogeveen et al. 2005; Bhorat et al. 2006; van der Berg et al.(2005, 2007), Bhorat and van der Westhuizen, 2008), yet, the decline in poverty incidence is slow and insufficient to impose tangible fall in poverty rate. Conversely, the decline in poverty rate is not synonymous to fall in poverty incidence. Recent poverty and inequality studies have reported a scenario where poverty incidence is reduced but poverty rate is relatively high (e.g. Leibbrandt et al. 2009,2011). Then again, increased access to social transfers (e.g. grants) to poor as a form of social protection, as well as, the progressive tax system adopted by the government post-1994 to facilitate redistribution from the rich to the poor – combined, these pro-poor policies are suffice to validate the lifting of the poor towards the poverty line (see e.g. World Bank 2014; Gumede, 2009)

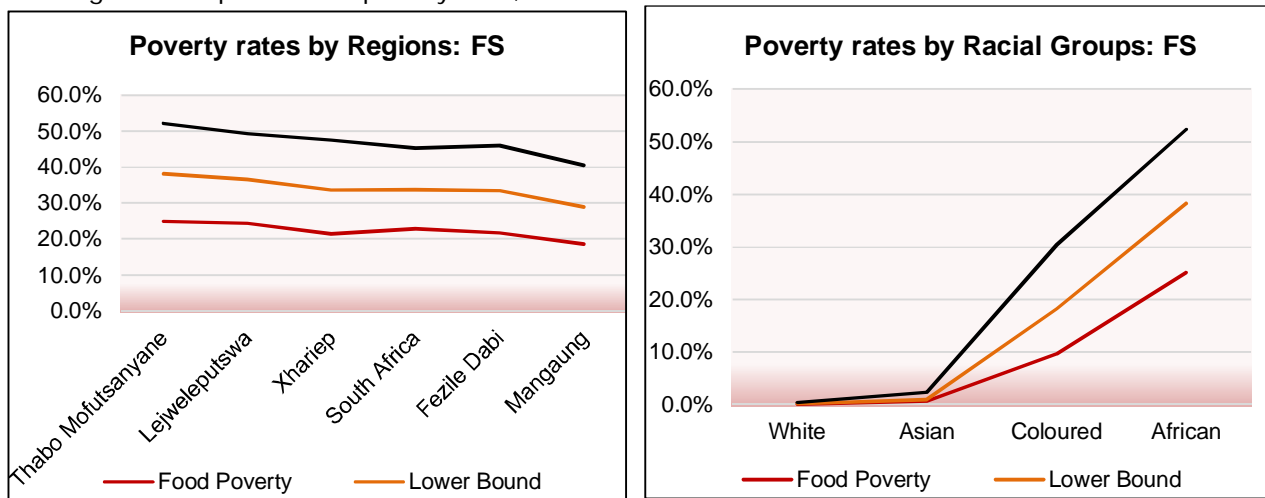
Considering the changing pattern of poverty rate in the Free State, from Table 1, there is an apparent decline in poverty between 2006 and 2011, whichever FGT measuring index is used. In particular, the headcount ratio declined from 61.9 percent (2009) to 41.2 percent (2011), same as the poverty gap fell from 28.4 percent to 17.5, and poverty severity from 15.8 percent to 9.3 percent. Of course, the observed

decline is associated with the national government intensive effort to raise fiscal allocation for targeted social grants, and widen the scope of grants using poor-poor policies that grant the large number of poor household an increased access to grants (World Bank, 2014). For instance, The number of social grant takers in **South Africa has increased from** 4 million (in 1994) to 16.9 million (as of September 2015)<sup>13</sup>.

Focusing on the Free State province, looking at Figure 1, which compares poverty rates by race and municipality at one point in time. Alternatively, the distance between poverty lines may be used, preliminary, to assess the sensitivity of average incomes as higher poverty lines are opted for (see Table 13 in the Appendix) . For instance, Thabo Mofutsanyane and Lejweleputswa recorded a headcount ratio of roughly 25% using the food poverty line in 2014 (i.e. R406), but the proportion of the people living below the upper poverty line in the same period varies by 3 percent indicating the intensity of income poverty between these municipalities.

By looking closely, poverty rates disparity seems to widen along racial groups, poverty is almost non-existent among Whites and Asians racial group, but quite severe in Coloured and African population. Noticeably, poverty is concentrated in Thabo Mofutsanyane and Lejweleputswa and among African and Coloured racial group.

Figure 1: Snapshot of F.S poverty rates, 2014



Data source: Global Insight (2015), Own illustration

<sup>13</sup>See IOL New (online) titled "Social grant on the rise" at <http://www.iol.co.za/business/budget/social-grants-are-on-the-rise-1989452>. In the 2016 Budget Review (National Treasury, 2016), the South Africa government has increased budgetary allocation for social grants to R11.5billion over the next three years. Specifically, about R167.5bn to social security, and old-age and child-support grants were allocated R58.9bn and R52bn respectively. The bulk of the allocation (R140.5bn) is earmarked for the different social grants. Overall, the national government's fiscal spending to support social grants is anticipated to grow from R154.4bn in 2015/16 to R195bn by 2018/19, accounting for 12.9 percent of total spending over the medium-term expenditure framework period

#### 4.1.1. Analysing the extent of Poverty Rate using Minimum (income) Thresholds

[ Insert Table 14 in the Appendix here – *Poverty Measures by Province*]

On the other hand, even if, poverty is analysed using some of form of universally acceptable benchmark of poverty minimum threshold in the like of food poverty line, and lower and higher (income) bounds<sup>14</sup>, the prevalence of poverty incidence in the Free State (across local municipalities) remain high. For instance, the quantitative results based on selected minimum threshold tabulated in Table 15, reflects the proportions of individuals that receive less than a specified minimum threshold from 1996 to 2014. Drawing from the tabulated income data, if the food poverty line is taken to represent a level of income below which individuals are unable to purchase sufficient food for minimum nutritional requirement stood at R111 in and adjusted upwards by inflation to R406 in 2014. In other words, Individuals living under this line (i.e. R406) are in living in extreme poverty.

[ Insert Table 15 in the Appendix here – *District Poverty Estimates*]

The again, considering the lower bound poverty line<sup>15</sup> which, at R548 is a more relaxed definition of poverty or an alternative upper bound line at R767 per month. Estimated results shown in Tables 2 ad 3, suggests that the percentage share of individuals living under extreme poverty declined across all local districts/municipalities in the Free State. Vividly, between 2006 and 2014, poverty incidence were significantly lower in Xhariep and Thabo Mofutsanyane districts, with negligible change in poverty dynamics in Mangaung Metropole.

Additionally, using the three set of poverty lines, namely food poverty line (FPL), lower-bound poverty line (LBPL) and upper-bound poverty line (UBPL) published in 2012 by World Health Organisation (WHO). Given these selected poverty lines, obtained empirical results in Tabel 3, shows that, across all the municipalities, Mangaung metro had the lowest headcount ratio in all the three selected FPL, LBPL and UBPL poverty lines. For instance, in 1996, 2005 and 2014 the food line ratio stood at 26.4%, 27.4% and 18.6 respectively. While Thabo Mofutsanyane had the highest incidence of poverty reaching 43.1%, 39.9% and 25.0% in the same period of review. Shifting the poverty line higher to the LBPL, poverty incidences accelerated by 13 percentage points in Thabo Mofutsanyane and by additional 14 percentage points when using a more stricter definition.

#### 4.1.2. Analysing the extent of Poverty Rate using Poverty Gap.

Further, from Eq. 3.1, poverty gap ratio represent the average individual shortfall from the poverty line, a useful analytical ratio to compute poverty depth, as well as, determine how much (fiscal) resources is required to lift (or graduate) the poor out of poverty. It is worth noting that, while the poverty gap ratio is a convenient estimate of minimum financial resources needed to alleviate poverty, it is practically impossible to perfectly allocate the exact amount of money to each poor individual in order to meet their individual requirements.

---

<sup>14</sup> It is a common practice in poverty assessment studies to utilize universally acceptable (and estimated) monetary minimum threshold as a benchmark, for South Africa, see Hoogeveen et al. (2006) and Woodlard et al. (2009)

<sup>15</sup> The minimum threshold estimated by Stats SA used in the NDP (2012) to set policy target for poverty rate in South Africa.

Also, the accrued administrative costs to provide minimum finance assistance needed by the poor is bound to rise dramatically beyond the initial cost estimated owed to general price increase (inflation). As such, the minimum financial requirement is estimated for the five (4) local municipalities including the Managing metropole in the Free State, as depicted in Table 3, yet, owed to variability in projected costs associated with inflationary pressure and administrative costs, the estimated should be treated with caution.

Table 1: Poverty gap rate (from upper poverty)

	Mangaung	Xharies	Lejweleputswa	Thabo Mofutsanyane	Fezile Dabi
1996	30.9%	33.4%	32.5%	33.4%	32.3%
2005	30.9%	31.9%	31.9%	32.4%	31.5%
2014	27.1%	26.9%	28.0%	27.5%	27.3%

Data source: Global Insight (2015), Own calculations

Overall, it is evident that poverty rate have decline across all the municipalities in the Free State as expected, an improvement closely linked to an expanding social transfers, which in turn, induce a positive impact on the poorest population. In the same vein, from Table 1, based on the upper poverty rate, presently (i.e. as of 2014), on aggregate, poverty rate remains acutely high by hovering between 27% and 31%, in particular, poverty incidence is more deep-rooted in Lejweleputswa local municipality, closely followed by, Mofutsanyane, Fezile Dabi, Mangaung, while Xharies is closest to the estimated poverty line for the period under review.

[ Insert Table 16 in the Appendix here – *Closing the Gap*]

Table 16 explains the poverty gap by quantifying the amount of financial resources needed to bring the income of the poor up to the upper bound poverty line. Masilonyana, Maluti a Phofung, Nala, Matjhabeng and Setsoto Local Municipality have the highest severity of poverty in the province. While municipalities such as Letsemeng, Dihlabeng, Tokologo, Nketoana and Mantsopa have the least intense poverty in the Free State. However, cost estimation process also involves population count in each municipality and therefore densely populated municipality will need more resources to eradicate poverty. Mangaung require the largest share of fiscal transfers, followed by Thabo Mofutsanyane and Lejweleputswa district municipality each requiring R163 million, R153 million and R133 million per annum respectively.

#### 4.1.3. Changing Poverty Rate in the Free State ? Evidence from Sectoral Decomposition

Hitherto, concrete evidence from our exploratory analysis on the extent of poverty incidence in the Free State suggests a decline in poverty incidence as large proportion of poor household gain access to social transfers, nonetheless, the marginal decline in poverty incidence does not have any impact on the growing poverty rate across the local municipalities.

Next, apart from examining the changing pattern of poverty in a particular region, it is also important to identify the dynamic evolution of poverty a certain time period purposely to determine the contributing factors to persistently high poverty rate (and/or its increase/decrease) associated with either inter-regional or intra-regional factors. In this way, by isolating the main contributing factors to a changing pattern in poverty rate could aid in designing an effective anti-poverty policy.

Using the additive property of the FGT, we decomposed the 'shifts' in poverty over time into two components, viz: (i) inter-regional (changes in poverty *within* local municipalities/ districts) and (ii) intra-

regional (changes in poverty resulting from *changes in population share* of local municipalities/districts). This decomposition is possible because poverty rate as a multi-dimensional problem is influenced by the interaction between inter-regional and intra-regional effects (cf. Ravallion and Huppi, 1991).

Following, Ravallion et al. (1991) technique, we assumed that a shift (i.e. change) in poverty can be expressed as a sum of changes generated within and between the districts as well as the interaction thereof. Mathematically, it can be represented as follows:

$$\Delta P_t = \sum_{i=1}^d N_{i(t-1)} (P_{it} - P_{it-1}) + \sum_{i=1}^d P_{i(t-1)} (N_{it} - N_{i(t-1)}) + \sum_{i=1}^d (P_{it} - P_{it-1}) (N_{it} - N_{i(t-1)}) \quad \text{Eq.4}$$

where,  $P_{it}$  is the poverty measure in municipal district  $i$  at time,  $t$  while  $d$  is the number of municipal districts, and  $N_{it}$  is the population share per district.

By applying Eq. 4, we analysed the 'shift' (changes) in poverty rate across the four local municipalities/district including the metropole, by decomposing shifts in poverty between municipal districts. Technically, the additive property of the FGT (the three different poverty measures) enables the quantification of various sub-groups to changes in overall poverty over time.

For instance, decomposition of poverty overtime may be expressed as: (i) changes in poverty due to changes in the population shares of district, or inter-regional changes, (ii) changes in poverty within a specific district, or intra-regional changes, and (iii) changes in poverty owed to the possible correlation between intra-regional and inter-regional changes, or interaction effects. The results of the empirically estimated "shift" in poverty as regional decomposition is presented in Table 2.

From results in Table 5, evidence reveals that the aggregate shift (change) in poverty between 1996 and 2005 is mostly attributable to changes *within* the districts, this evidence is supported by the fall in overall food poverty by 2.3% and 10.9% in the period between 1995 and 2005 and 2005 and 2014 respectively, compared to the inferred fall by 1.8% associated with intra-regional contribution. On the contrary, possible exogenous factors (i.e. outside the local municipalities / districts) filtering into the municipalities/districts tend to marginally increase poverty between 1995 and 2014, with a stronger effect on poverty between from 2005 to 2014.

On this finding, it is conceivable that rural-urban migration in search for better lives, in particular, jobs by poor able bodied workers (especially, into Mangaung metropole) is a contribution factor driving localised poverty rates externally. In addition, as estimated from Eq. 4, the correlation associated with shifts "changes" in population shares and changes in poverty within district contributed favorably in poverty reduction averaging -0.1%.

Meanwhile, the estimated provincial average percentage change in poverty between 1996 and 2005 is roughly -5%, whereas, between 2005 and 2014 the estimated shift is -12% signifying a significant decrease. Finally, in terms of regional decomposition of poverty shifts, the local municipality highest decline overall poverty is Thabo Mofutsanya, followed by Lejweleputswa, Fezile Dabi, Xhariep and Mangaung Metro municipality.

Table 2: Poverty Regional Decomposition

	<b>Overall Change</b>	<b>Mangaung</b>	<b>Xhariep</b>	<b>Lejweleputswa</b>	<b>Thabo Mofutsanyane</b>	<b>Fezile Dabi</b>
<b>Food Poverty</b>						
Change (1996-2005)	<b>-2.3%</b>	0.8%	-0.3%	-1.5%	-0.9%	-0.4%
Intra-regional	<b>-1.8%</b>	0.2%	-0.4%	-0.3%	-0.9%	-0.4%
Inter-regional	<b>-0.6%</b>	0.5%	0.2%	-1.3%	0.0%	0.0%
Interaction effect	<b>0.0%</b>	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Food Poverty</b>						
Change (2005-2014)	<b>-10.9%</b>	-1.5%	-0.9%	-2.4%	-4.5%	-1.6%
Intra-regional	<b>-11.3%</b>	-2.2%	-0.8%	-2.4%	-4.2%	-1.8%
Inter-regional	<b>0.6%</b>	1.0%	-0.2%	0.0%	-0.5%	0.4%
Interaction effect	<b>-0.2%</b>	-0.3%	0.1%	0.0%	0.2%	-0.1%
<b>Lower bound Poverty</b>						
Change (1996-2005)	<b>-6.0%</b>	0.3%	-0.5%	-2.9%	-1.9%	-1.0%
Intra-regional	<b>-5.3%</b>	-0.5%	-0.7%	-1.2%	-1.9%	-1.0%
Inter-regional	<b>-0.8%</b>	0.8%	0.2%	-1.8%	-0.1%	0.0%
Interaction effect	<b>0.1%</b>	0.0%	0.0%	0.2%	0.0%	0.0%
<b>Lower bound Poverty</b>						
Change (2005-2014)	<b>-12.1%</b>	-1.6%	-1.0%	-2.7%	-5.1%	-1.7%
Intra-regional	<b>-12.8%</b>	-2.6%	-0.8%	-2.7%	-4.6%	-2.1%
Inter-regional	<b>0.9%</b>	1.4%	-0.3%	-0.1%	-0.7%	0.6%
Interaction effect	<b>-0.2%</b>	-0.4%	0.1%	0.0%	0.2%	-0.1%
<b>Upper bound Poverty</b>						
Change (1996-2005)	<b>-7.6%</b>	0.0%	-0.5%	-3.7%	-2.2%	-1.2%
Intra-regional	<b>-6.7%</b>	-1.0%	-0.7%	-1.6%	-2.2%	-1.2%
Inter-regional	<b>-0.9%</b>	1.1%	0.3%	-2.3%	-0.1%	0.1%
Interaction effect	<b>0.1%</b>	-0.1%	0.0%	0.2%	0.0%	0.0%
<b>Upper bound Poverty</b>						
Change (2005-2014)	<b>-11.4%</b>	-1.2%	-1.1%	-2.7%	-5.0%	-1.4%
Intra-regional	<b>-12.4%</b>	-2.7%	-0.8%	-2.7%	-4.3%	-2.0%
Inter-regional	<b>1.2%</b>	1.8%	-0.4%	-0.1%	-0.9%	0.7%
Interaction effect	<b>-0.2%</b>	-0.4%	0.1%	0.0%	0.2%	-0.1%

Data source: Global Insight (2015), Own calculations

#### 4.1.4. Using Qualitative Method to Analyse Poverty in the Free State.

It is a contentious view in the poverty analysis literature that quantitative scrutiny of poverty mainly narrow assessment of poverty on “shifts”, that is changes, and measured poverty in terms of income (money metric measures) without taking into account the qualitative quantification of poverty in a broader perspective (cf. Gumede, 2009), as such quantitative assessment of poverty are useful to some extent, for policy design and/or implementation. To give a balanced assessment, following extant literature, an array of qualitative indicators are used in this section, to assess the extent of poverty in the Free State, viz: human development index, access by poor in the rural areas to basic amenities and asset ownership.

Focusing on the human development indices (HDI)<sup>16</sup>, we compare the three criteria of human development (i.e longevity, knowledge and standard of living) across district municipalities to highlight regional variations and differences thereof. As shown in estimated results in Table 17, Mangaung metropole has the highest human development rating revealing better living standards and lower multidimensional poverty. Note that, Mangaung is an urban metropolitan area compared to the remaining local districts which are largely rural areas. Along the same line, Xhariep and Thabo Mofutsanyane scored the lowest HDI, indicating slow development, as well as, an unbalanced socioeconomic development. Palpably, decent living standards is observed across all the municipalities.

Table 3: Human Development Index

Years	Mangaung	Xhariep	Lejweleputswa	Thabo	
				Mofutsanyane	Fezile Dabi
1996	0.61	0.49	0.54	0.51	0.56
2005	0.57	0.48	0.51	0.48	0.53
2014	0.63	0.56	0.59	0.57	0.60

**Source:** Global Insight, 2015

Furthermore, even though, previous section focused more on income poverty measures which reveals an essential dimension of poverty since it quantifies the amount of income available to households in order to acquire basic goods and services. Somehow, it conceals the differentiated experience of human development particularly the access to basic services. As a result, proceed to gauge the extent of poverty incidence in the Free State using a non-monetary approach to add another dimensions income poverty.

Looking at the accessibility of the population in the province to basic amenities, such as: portable water, electricity, flushed toilets, sanitation, and so on. From Table 8, which reflect qualitative measure used to assessed poverty in terms of easy access to services, as well as, the disparities linked to standard of living between the poor and the non-poor municipalities; it is notable that between 1996 to 2014, literacy standard (a proxy for educational attainment) is highest in Mangaung metropole, whereas, Xhariep has the lowest literacy rate.

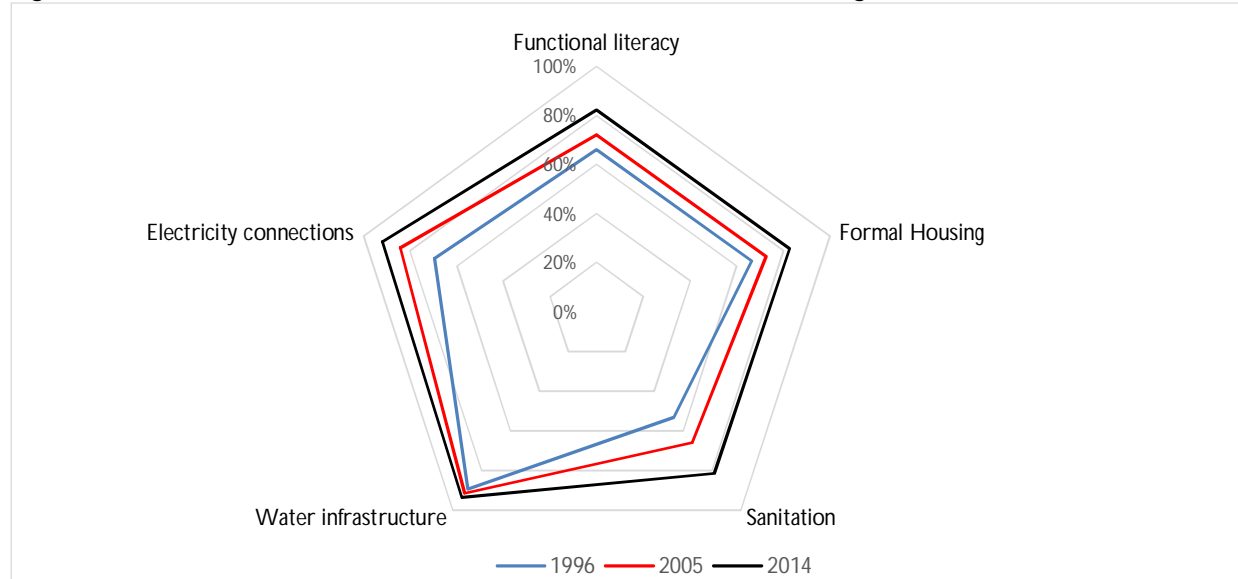
Moreover, in terms of measuring standard of living, the proportion of households occupying formal dwellings has increased significantly (reaching an average share of 84%) across all district. The biggest improvement in occupation of formal dwelling occurred in Lejweleputswa, recording an increase of 21 percentage points between 1996 and 2014. For the period under review, hygiene toilets are the most improved basic service delivered in the Free State. The share of households with hygienic toilets increased by 28 percentage points with most improvements occurring in Thabo Mofutsanyane. Using access to clean portable water as another qualitative measure of poverty, the data presented in Table 8 shows that piped water is the most accessible service in the Free State province as a whole, this is followed by access to electricity which is mostly concentrated in Xhariep local municipality. Additionally, refuse disposal is the least provided service with Thabo Mofutsanyane receiving the poorest refuse disposal services. Overall, Mangaung and Fezile dabi are the highest recipients of basic services while Thabo Mofutsanyane receives the least services among all districts in the Free State.

[ Insert Table 16 in the Appendix here – *Qualitative Measures of Poverty* ]

<sup>16</sup> HDI is made of three major dimension of human development, namely: long and healthy life (longevity), access to education - knowledge accumulation and (iii) decent standard of living.

To substantiate the inference of an improved access to basic amenities in the province, a glance at Fig. 2 validate that, in terms of provision of basic infrastructure, large number of households have access to portable clean water, followed by electricity, access to these services improved significantly since 1996. Notably, although provision of sanitation service has improve, accessibility remains relatively lower.

Figure 2: Well Being Indicators



Data source: Global Insight (2015), Own illustration.

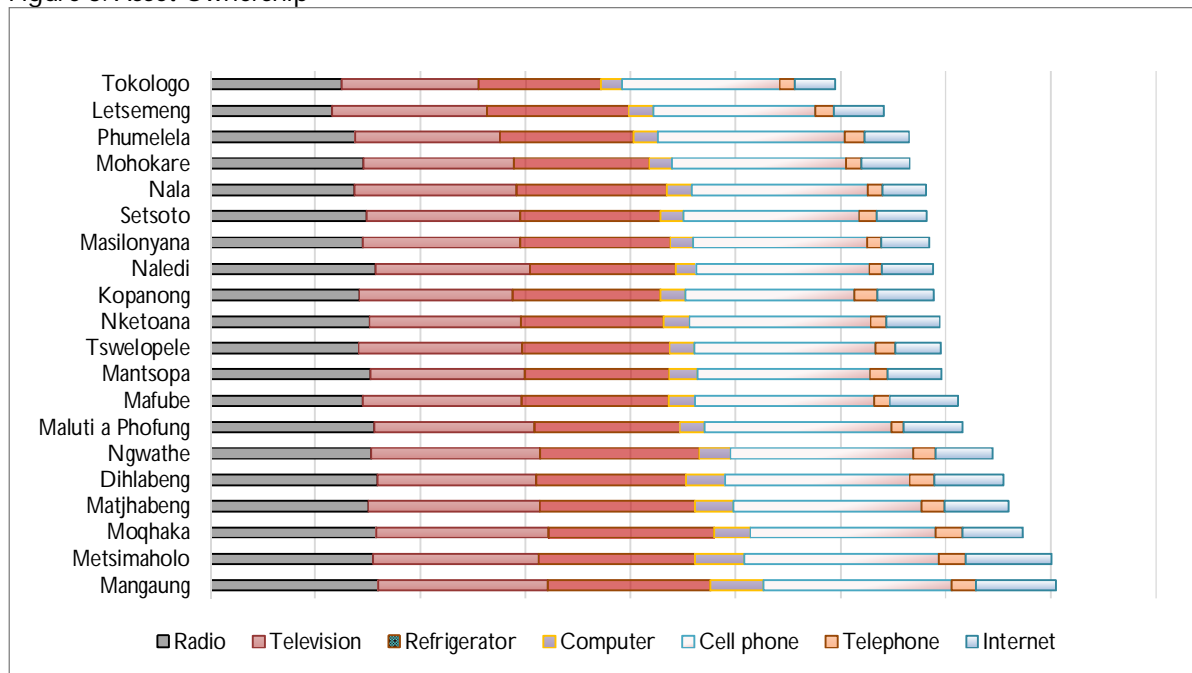
Finally, asset ownership is another relevant qualitative measure to determine the extent of poverty incidence. For example, the graphical illustration presented in Figure 3 shows the pattern of asset ownership patterns in all local municipalities in the Free State. First, it clear that municipalities with higher income per capita or with lower incidence poverty tend to have higher assets individual holdings. For instance, Mangaung households own most assets whereas Tokologo owns the least which is indicative of regional imbalance wealth distribution. Furthermore, cellphones are the most preferred assets followed by television sets and radios. On the other hand, internet accessibility is much higher than computer ownership. The least preferred asset is landline telephone.

Nevertheless, the usceptibility of the poor to severe poverty shocks in the absence of (transitory) income stream, from the fiscal and welfare gain viewpoint, cash transfers (or social wage) is a widespread anti-poverty tool used by most government (if not all) in developed and developing countries to provide some sort of a risk coping mechanism and relief for the poor. Thus, as cited, in South Africa, cash transfer has been crucial for redistribution of income in the post-Apartheid era (since 1994), this is so, because accrued benefits by the poor translates into a direct impact, such as meeting basic needs to smoothen consumption and improve their nutrition level. In essence, the South African government contribute to the costs living of the poor through its adopted progressive tax system ( see van der Berg, 2009),nonetheless, the finding of Leibbrandt et al. (2011) suggests that impact of fiscal redistribution to alleviate poverty and eradicate inequality remains relatively low.

To this end, we present a synoptic view of the social grants system in South Africa. As shown in Table 4, the most important types of grants are the Child Support Grant, Old-Age and the Disability Pension. Government spending on social grants increased from 3.0 million in 2000/01 to an estimated roughly

17 million 2015/16 (National Treasury, 2013, 2016), which contributed in highly redistributive fiscal stance although inequality still persist.

Figure 3: Asset Ownership



Source: StatsSA, 2011 Census, Own illustration.

Nevertheless, the susceptibility of the poor to severe poverty shocks in the absence of (transitory) income stream, from the fiscal and welfare gain viewpoint, cash transfers (or social wage) is a widespread anti-poverty tool used by most government (if not all) in developed and developing countries to provide some sort of a risk coping mechanism and relief for the poor. Thus, as cited, in South Africa, cash transfer has been crucial for redistribution of income in the post-Apartheid era (since 1994), this is so, because accrued benefits by the poor translates into a direct impact, such as meeting basic needs to smoothen consumption and improve their nutrition level.

In essence, the South African government contribute to the costs living of the poor through its adopted progressive tax system ( see van der Berg, 2009),nonetheless, the finding of Leibbrandt et al. (2011) suggests that impact of fiscal redistribution to alleviate poverty and eradicate inequality remains relatively low.

To this end, we present a synoptic view of the social grants system in South Africa. As shown in Table 4, the most important types of grants are the Child Support Grant, Old-Age and the Disability Pension. Government spending on social grants increased from 3.0 million in 2000/01 to an estimated roughly 17 million 2015/16 (National Treasury, 2013, 2016), which contributed in highly redistributive fiscal stance although inequality still persist. On the downside, further fiscal redistribution is now constrained by the size of the budget and therefore limits government intervention in alleviation of poverty (e.g. see., van der Berg, 2009) as fiscal space to generate ample revenue to meet the growing demand for social transfers by the way of imposition of high taxes on the rich households is currently limited (World Bank, 2014).

Table 4: Types of Social Grants

Thousands	2009/10	2010/11	2011/12	2012/13 <sup>1</sup>	2013/14	2014/15	2015/16
	Actual		Revised Estimates			Projected	
Type of grant							
Old age <sup>2</sup>	2 491	2 648	2 711	2 851	2 931	3 013	3 096
Disability	1 299	1 212	1 172	1 179	1 180	1 181	1 181
Foster care	489	490	518	529	569	604	633
Care dependency	119	121	122	130	135	140	146
Child support	9 381	10 154	10 675	11 406	11 699	11 937	12 116
<b>Total</b>	<b>13 779</b>	<b>14 625</b>	<b>15 198</b>	<b>16 095</b>	<b>16 514</b>	<b>16 875</b>	<b>17 172</b>
<b>Free State</b>	<b>806</b>	<b>869</b>	<b>900</b>	<b>941</b>	<b>961</b>	<b>977</b>	<b>992</b>

Source: National Treasury, 2013

Concluding the discussion on the extent of poverty rate in the Free State province, heretofore, theories and empirics emphasizes the importance of employment-intensive growth (Hull, 2009; Ames et al. 2001; Stern, 2003; Khan, 2004), an increased public investment in labour-intensive infrastructure projects (e.g. see World Bank, 2001, 2014)<sup>17</sup>, fiscal transfers (see, eg. Van der berg et al. 2005; Woodlard et al. 2009; Leibbrandt et al. 2011, Chibba et al. 2011); access to finance and credits to encourage self-employment and micro-business establishment (ILO, 2012; Hull, 2009; Khan, 2001) and effective governance (e.g. Van der berg, 2010) are key ingredients to stimulate economic growth suffice to generate employment, reduce poverty and inequality.

It is worth noting that, the South African fiscal redistribution system of using cash transfers to ameliorate vulnerability of the poor to (extreme poverty), over the years, have been found to be effective, among other developing countries as reported by World Bank (2014), however, the incentive of progressive tax system to generate revenue required to finance the growing social safety net is waning<sup>18</sup> due to increasing tax burden on the rich which could trigger off shore investment to preserve their wealth, disinvestment in the economy and tax evasion/avoidance problems.

As such, it is imperative that government policy are pro-growth and allow active participation of the private sector to create wage-generating employment, raise output and labour productivity and provide the much needed revenue, required by the government to augment funds from foreign donors, to be able to meet the increasing social demands related to expanding the current safety net, as well as, initiate public employment programmes to draw the poor into productive work, in effect, raising the absorption rate of the domestic labour market, which in turn, stimulates economic growth which is also driven by the performance of the economy.

<sup>17</sup> For comprehensive survey of literature on infrastructure-economic growth-poverty or inequality nexus, see Gramlich (1994), Kessides (1996), Romp and de Haan (2005), Pereira and Andraz (2012). For specific empirical evidence on the reducing effect of high infrastructure investment on poverty (see, e.g. Calderon and Sérvén, 2004; Corong et al. 2012), on reducing inequality (Fereira, 1995; Lopez, 2003; Estache and Fay, 1995) and income per capita (see Chong and Calderon, 2001; Romp and de Haan, 2007). Amongst others, for South Africa, see Fedderke and Garlick (2008), Fedderke and Bogetic (2006), Perkins (2005), Ngadu (2010); Gnade (2012), Kumo, (2012) and Amusa (2016).

<sup>18</sup> For example, see World Bank (2014) and Seekings (2002). Indeed, van der Berg et al. (2005) maintained that social assistance, in South Africa is, somewhat, insufficient to alleviate poverty.

## 4.2. How wide is the Inequality Gap in the Free State?

It is general consensus in the literature on poverty-inequality nexus that inequality is closely associated with poverty, yet, factors driving inequality are mostly labour market related, particularly, the existence of labour market segmentation (i.e. the lower wage sector consisting of low skilled workers, and the high wage sector that is capita intensive requiring higher skill), wage disparity, level of education and training – core determinant of skill level.

Per definition, inequality is considered as the dispersion and/or concentration of income or any welfare indicator (Litchfield, 1999). Plethora of poverty and inequality studies in South Africa concurred that inequality is evident along racial lines, driven forcefully by skill level/work experience, wage disparity, and the segmented labour market<sup>19</sup>. Indeed, Woodlard et al. (2011) provides evidence for persisting income inequality driven by skill level, and concludes that the inability of domestic growth to stimulate sizeable employment opportunities for the large proportion of unskilled and semi-skilled workers in the labour market effectively remove any poverty-alleviation impetus from the labour market. This is evidenced by increasing use (and predominant role) of social grants to mitigate poverty in the post-Apartheid era.

The characteristic nature of poverty and inequality is mainly driven by income distribution along the racial line, as well as, geographical locations. Given the policy shift to redress the inequality gap created by past Apartheid regime, which completely isolate the majority of the population (i.e. African Black) from: active participation in the labour market (due to lack of skill, work experience and training), adequate education – necessary for human capital development, and so on. To adequately analyse the existing inequality gap in province, we rely on available income data published by StatsSA, and follow a comparative analysis approach. Table 9 present relevant results of the cross-sectional income analysis.

Focusing on the period from 1997 to 2014, from Table 5, it is evident that there is an income bias across the different race, as well as, local municipalities in the Free State. Although there is slight improvement, Thabo Mofutsanyane has the lowest individual relative income to Mangaung. On race, Africans are relatively the poorest and are experiencing a declining per capita income in terms of White level. The stark contrast in wages between Africans and Whites confirmed the huge income inequality gap between these race, and the persistent high poverty rate among the former – racial groups, because smaller share of income is available to the poor household, which made up the bottom decile, in effect, the unbalance income distribution lowers the consumption function of the poor household, and exacerbates their exposure to severe poverty.

The large share of income related to earnings / wages among the minority group (Whites), which occupies the top deciles is not surprising, but due to the perverse laws and policy enacted during the Apartheid era. This have spur intra-generational poverty among the majority racial groups in South Africa. In fact, the result of World Bank's (2014) in the cross-country study on the effectiveness of adopting fiscal re-distribution policy among 12 emerging countries with high poverty and inequality gaps, for South Africa, evidence suggests that the income of the 10% of rich household (occupying the top income decile) is 66 times higher than the income of the 10% of the poor (in the lower income decile).

---

<sup>19</sup> For example, see Leibbrandt et al. (2011) and Woodlard et al. (2009) among others.

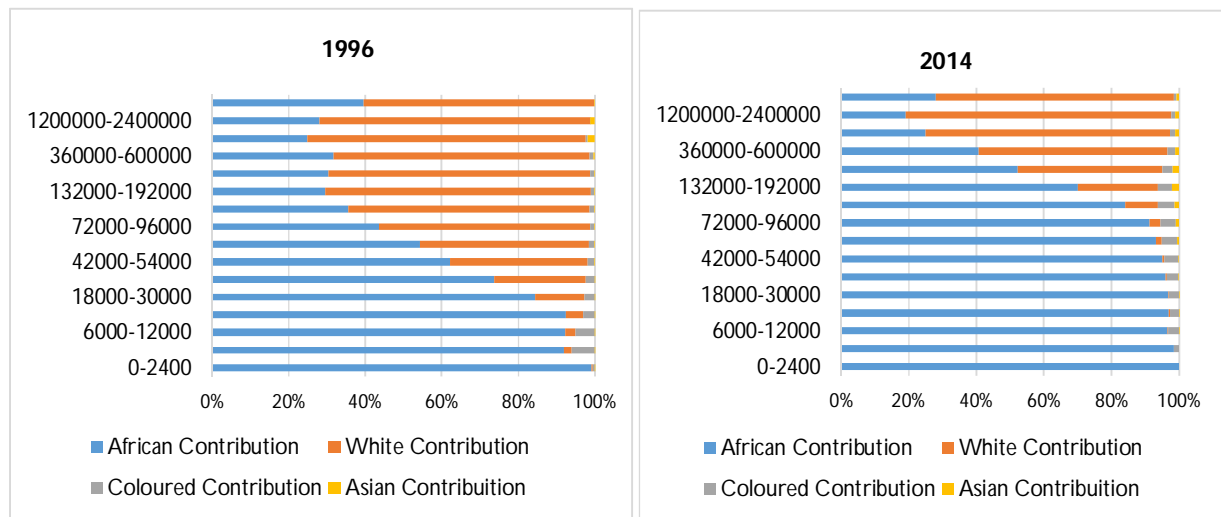
Table 5: Relative Salaries

Year	Xhariep	Mangaung	Lejweleputswa	Thabo Mofutsanyane	Fezile Dabi
<b>Relative per Capita personal Income as a % of Mangaung Metro income earners</b>					
1997	59%	100%	71%	54%	76%
1998	59%	100%	71%	53%	76%
1999	60%	100%	71%	53%	76%
2000	60%	100%	72%	52%	76%
2001	61%	100%	72%	52%	76%
2002	63%	100%	71%	53%	77%
2003	65%	100%	70%	54%	78%
2004	67%	100%	69%	55%	79%
2005	68%	100%	69%	56%	79%
2006	69%	100%	69%	56%	80%
2007	69%	100%	68%	56%	79%
2008	69%	100%	69%	57%	79%
2009	68%	100%	69%	57%	79%
2010	68%	100%	69%	57%	79%
2011	67%	100%	68%	57%	79%
2012	64%	100%	68%	56%	78%
2013	66%	100%	68%	58%	80%
2014	71%	100%	73%	63%	85%
1996	58%	100%	71%	55%	76%
<b>Relative per Capita personal Income as a % of White earnings</b>					
	<b>African</b>	<b>Whites</b>	<b>Coloured</b>	<b>Asian</b>	
1996	17%	100%	17%	54%	
1997	17%	100%	17%	67%	
1998	17%	100%	18%	75%	
1999	17%	100%	19%	74%	
2000	17%	100%	20%	72%	
2001	17%	100%	21%	80%	
2002	17%	100%	22%	78%	
2003	17%	100%	21%	71%	
2004	17%	100%	22%	64%	
2005	17%	100%	23%	58%	
2006	17%	100%	23%	58%	
2007	17%	100%	24%	62%	
2008	17%	100%	26%	72%	
2009	17%	100%	27%	80%	
2010	16%	100%	26%	77%	
2011	16%	100%	25%	71%	
2012	15%	100%	24%	64%	
2013	15%	100%	23%	58%	
2014	15%	100%	21%	55%	

Data source: Global Insight (2015), Own calculations

Figure 5 shows a racial composition of a total number of households by income category, from the graphical inspection a bulk contribution of low income categories comes from Africans household while the top remaining categories mainly belongs to white households. For the period between 1996 and 2014, share of white household in high income categories increased and virtually declined in low income categories. In contrast, large proportion African households are relegated to lower categories.

Figure 4: Households by Income Category: Comparing 2006 and 2014



Data source: Global Insight (2015), Own calculations

#### 4.2.1. Analysing Inequality Gap: One-Stage Theil-T Decomposition and Gini Coefficient Technique

To investigate the evidence of inequality gap, as well as, identify the magnitudinal effect of the existing inequality gap, we follow the set out commonly use techniques set out in Eqs. 5.1, 5.2 (one-stage Theil-T decomposition) and 6 (Gini coefficient).

Although, the paper essentially aims to highlight patterns of poverty and inequality in Free State, it is an empirical tradition to accentuate the extant racial inequalities given the past history of racial segregation in the country. From Table 6, since 1996 till date, to some extent, racial inequality has improved, this is a common consensus in the poverty and inequality literature on South Africa. However, inequality gap significantly widens along the racial lines, between the White and other racial groups, in particular, the African Black households (the majority of the population), followed by the Indians/Asian. Noticeably, “within” group inequality shows that the White population is relatively equal, whereas inequality is high among the African Blacks, and the Asian/Indian groups.

Table 6: Comparisons of Racial Inequality from 1996 to 2014 - Gini coefficient

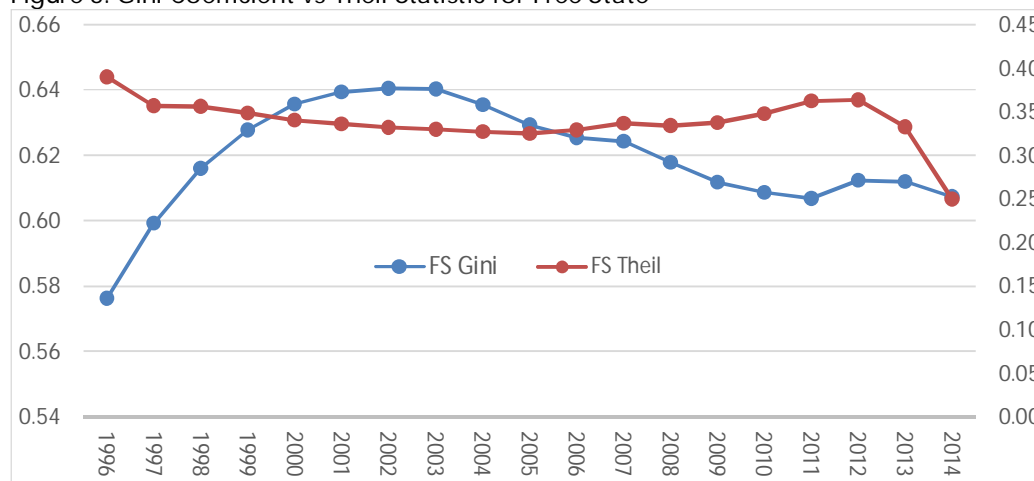
	1996	2005	2014
<b>African</b>	0.62	0.58	0.57
<b>Coloured</b>	0.53	0.48	0.43
<b>Indian/Asian</b>	0.48	0.53	0.48
<b>White</b>	0.44	0.48	0.43
<b>National</b>	0.68	0.65	0.64

Data source: Global Insight (2015), Own calculations

Next, looking at the results of the Gini coefficient and Theil-T Index employed as inequality measuring tools, as illustrated in Figure 6, Tables, 7, 8 and 9. First, for the period between 1996 and 2003, inequality among households deteriorated and showed a slight improvement in recent years. Likewise, Theil index improved from 0.4 in 1996 to 0.25 in 2014 indicating general improvement in the provincial inequality. In fact, the shrinking Theil index may imply the following, the wealthy become less wealthier or/and

poor become less poorer. Table 9 will show that while two factors are pushing the overall index slightly downwards, it is the poorer that are becoming well off in comparison to the rich getting less richer.

Figure 5: Gini Coefficient vs Theil Statistic for Free State



Data source: Global Insight (2015), Own illustration.

Furthermore, taking into account the existence of inequality in a particular local municipality/district, the Theil-T decomposition based on *between*-district and *within*-district components reveals that a significant share in the overall district income inequality between 1996 and 2014 is mainly driven by *between*-district component which accounts for an average of 68% of the total inequality (refer to Table 8). Albeit, it should be noted that, the *between-district component* improved from 0.43 in 1996 to 0.27 in 2014. On the other hand, *within-district component*, although declining in absolute terms, is increasing in relation to the *between-district component*, implying that **provincial income inequality is increasingly shaped by within-between district income disparities.**

Then again, a further decomposition of the aggregate Theil T index results into individual municipality/districts Theil T indices in a given year. The Tabulated results in Table 9, firmly asserts that the period under review (1996 -2014), Mangaung metropole and Fezile Dabi are marked by persistently large Theil-T indices, an indicative of the most unequal distribution of income. In contrast, Xhariep appear to be the most equitable local municipality. Overall, moderate income distribution is observable across the local municipalities/districts in the Free State, indication a relative reduction in income gap between high and low income household.

Conversely, further analytical exercise to decompose the local municipalities/districts according to the nature of the decomposed Theil-T as positive or negative contributors Theil, where, positive contributions elucidates higher municipal average income relative to the whole district's and the opposite is true for the latter. Given this distinction, looking at the results in Table 13, in the Free State, there are two distinct geographical aggregation associated with inequality, that is, local regions with high average income and those with low average income, suggesting an existence of spatial imbalance in income distribution. For example, local municipalities such as Metsimaholo shows stronger positive contributions which indicates high income disparities while Tswelopele, for instance, shows stronger negative contribution. In addition, for the period under review, 1996 to 2014, analytical results affirmed that positive contributions outweigh negative contributions, by implication, **income inequality is driven by the high income households relative to the poorer households.** However, deterioration in the aggregate Theil-T index over time, given by the sum of both negative and positive contributions, shows both terms(negative and positive) are improving i.e. wealthy are becoming less wealthier and the

poor becoming less poorer. As discussed earlier, this inference can be explained by the progressive tax system adopted in South Africa serving as an income distribution tool in favour of the poor households.

Table 7 : One-Stage Inequality Decomposition by Theil-  $T$

Free State Province				
Years	Within	% Within	Between	% Between
1996	0.181	29%	0.436	71%
1997	0.187	30%	0.443	70%
1998	0.192	30%	0.447	70%
1999	0.194	30%	0.446	70%
2000	0.195	31%	0.443	69%
2001	0.194	31%	0.438	69%
2002	0.186	31%	0.413	69%
2003	0.177	31%	0.389	69%
2004	0.170	32%	0.367	68%
2005	0.164	32%	0.350	68%
2006	0.162	32%	0.341	68%
2007	0.165	33%	0.341	67%
2008	0.165	33%	0.336	67%
2009	0.167	33%	0.335	67%
2010	0.171	34%	0.338	66%
2011	0.176	34%	0.342	66%
2012	0.188	34%	0.357	66%
2013	0.173	34%	0.331	66%
2014	0.131	33%	0.271	67%

Data source: Global Insight (2015), Own calculations

Table 8: Decomposed Theil T-Indices Across Local Municipalities / Districts in Free State

Years	Thabo				
	Mangaung	Xhariep	Lejweleputswa	Mofutsanyane	Fezile Dabi
1996	0.523	0.006	0.016	0.019	0.052
1997	0.535	0.006	0.019	0.019	0.053
1998	0.541	0.006	0.022	0.019	0.052
1999	0.540	0.006	0.025	0.018	0.051
2000	0.537	0.006	0.028	0.017	0.049
2001	0.531	0.006	0.031	0.017	0.048
2002	0.510	0.005	0.028	0.015	0.041
2003	0.487	0.004	0.025	0.014	0.036
2004	0.466	0.003	0.023	0.013	0.031
2005	0.450	0.003	0.021	0.013	0.028
2006	0.444	0.002	0.019	0.013	0.026
2007	0.447	0.003	0.017	0.013	0.026
2008	0.443	0.003	0.015	0.014	0.027
2009	0.443	0.003	0.014	0.015	0.027
2010	0.449	0.003	0.013	0.015	0.028
2011	0.458	0.003	0.012	0.016	0.029
2012	0.480	0.002	0.015	0.016	0.032
2013	0.445	0.002	0.015	0.016	0.027
2014	0.342	0.005	0.016	0.013	0.026

Source: Global Insight, 2015, Own calculations

Table 9: Municipal Contributions to District Theil Indices

FS Local Districts	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Metsimaholo	0.72	0.71	0.70	0.67	0.65	0.63	0.57	0.52	0.48	0.45	0.44	0.45	0.45	0.47	0.48	0.49	0.53	0.49	0.48
Mangaung	0.52	0.53	0.54	0.54	0.54	0.53	0.51	0.49	0.47	0.45	0.44	0.45	0.44	0.44	0.45	0.46	0.48	0.44	0.34
Dihlabeng	0.47	0.46	0.45	0.44	0.42	0.41	0.39	0.37	0.36	0.35	0.35	0.35	0.37	0.38	0.39	0.40	0.40	0.38	0.32
Matjhabeng	0.43	0.45	0.46	0.47	0.48	0.47	0.44	0.42	0.39	0.37	0.35	0.35	0.35	0.34	0.34	0.33	0.37	0.34	0.28
Mantsopa	0.07	0.10	0.12	0.14	0.15	0.17	0.15	0.14	0.13	0.12	0.12	0.11	0.10	0.09	0.08	0.08	0.07	0.08	0.09
Letsemeng	0.15	0.16	0.15	0.15	0.15	0.14	0.11	0.09	0.07	0.05	0.04	0.03	0.03	0.04	0.03	0.02	0.03	0.08	0.17
Tokologo	-0.03	0.01	0.04	0.07	0.08	0.11	0.11	0.10	0.10	0.10	0.11	0.10	0.08	0.07	0.07	0.06	0.06	0.07	0.13
Kopanong	0.07	0.07	0.06	0.06	0.05	0.06	0.07	0.08	0.09	0.10	0.10	0.11	0.11	0.12	0.13	0.13	0.08	0.00	-0.11
Moqhaka	-0.10	-0.08	-0.06	-0.04	-0.02	0.00	0.00	-0.01	-0.01	-0.02	-0.02	-0.03	-0.04	-0.05	-0.05	-0.06	-0.08	-0.09	-0.10
Masilonyana	-0.11	-0.09	-0.07	-0.04	-0.01	0.01	0.01	0.01	0.01	0.00	-0.02	-0.04	-0.05	-0.07	-0.09	-0.11	-0.15	-0.19	-0.21
Setsoto	-0.02	-0.04	-0.05	-0.07	-0.08	-0.09	-0.09	-0.08	-0.08	-0.07	-0.07	-0.07	-0.06	-0.06	-0.06	-0.06	-0.06	-0.07	-0.07
Nketoana	-0.10	-0.11	-0.12	-0.13	-0.13	-0.13	-0.12	-0.10	-0.09	-0.07	-0.06	-0.05	-0.04	-0.03	-0.02	-0.01	-0.01	0.01	0.04
Naledi	-0.11	-0.09	-0.07	-0.05	-0.03	-0.02	-0.03	-0.04	-0.05	-0.06	-0.07	-0.07	-0.08	-0.09	-0.10	-0.10	-0.09	-0.08	-0.07
Mohokare	-0.10	-0.11	-0.12	-0.13	-0.15	-0.15	-0.13	-0.11	-0.09	-0.08	-0.06	-0.06	-0.05	-0.05	-0.04	-0.03	-0.01	0.00	0.03
Phumelela	-0.20	-0.19	-0.18	-0.17	-0.15	-0.15	-0.13	-0.11	-0.10	-0.09	-0.09	-0.09	-0.09	-0.10	-0.10	-0.10	-0.10	-0.11	-0.09
Ngwathe	-0.17	-0.18	-0.18	-0.18	-0.18	-0.18	-0.15	-0.13	-0.11	-0.09	-0.09	-0.09	-0.09	-0.10	-0.11	-0.11	-0.13	-0.11	-0.11
Nala	-0.10	-0.11	-0.13	-0.14	-0.16	-0.17	-0.16	-0.15	-0.15	-0.14	-0.14	-0.13	-0.13	-0.12	-0.12	-0.11	-0.11	-0.11	-0.12
Maluti a Phofung	-0.10	-0.11	-0.11	-0.11	-0.10	-0.10	-0.12	-0.14	-0.15	-0.16	-0.17	-0.18	-0.19	-0.20	-0.20	-0.21	-0.20	-0.21	-0.21
Tswelopele	-0.10	-0.15	-0.19	-0.23	-0.25	-0.26	-0.26	-0.25	-0.24	-0.23	-0.21	-0.19	-0.17	-0.15	-0.13	-0.11	-0.08	-0.04	-0.01

Source: Global Insight, (2015), Own calculation.

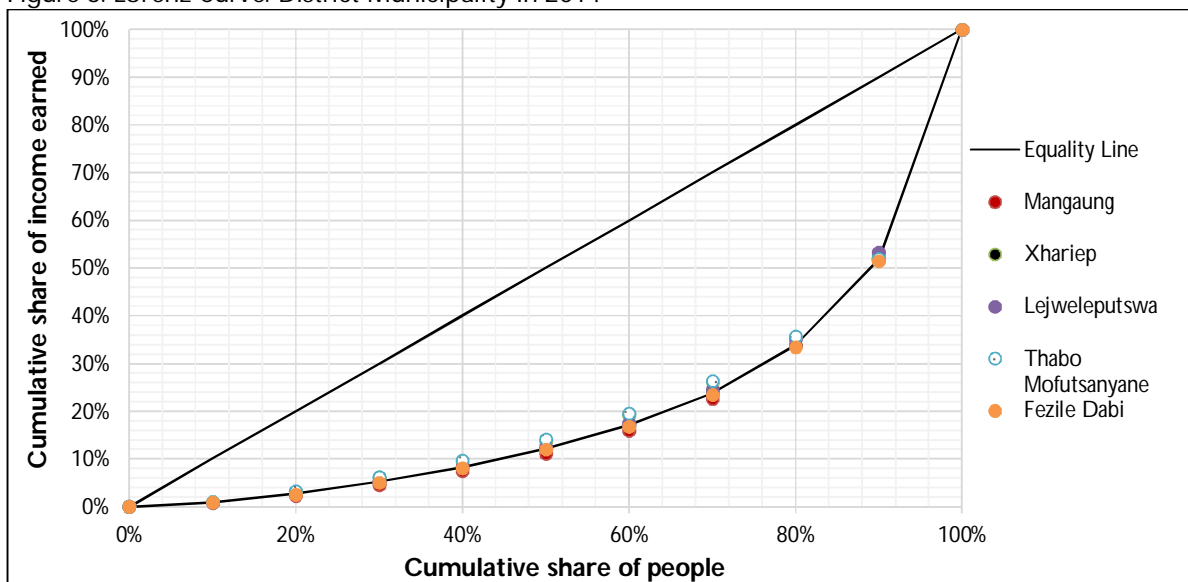
\*\*The [ ] grey shaded area denotes local municipalities with positive Theil-T index while light pink [ ] shaded area indicates local municipalities with negative Theil-T index

#### 4.2.2. Other Measures of Inequality Gap: Lorenz Curve, Gini Coefficient and Palma Ratio.

Generally known, the Lorenz curve is a graphical representation of income or wealth distribution and helps to answer the questions such as how much proportion of total income is accrued to the lowest or highest income earners. Additionally, Lorenz Curve forms the basis of many common inequality measures such as the Gini coefficient which is viewed as twice the area between the considered curve and the straight line of equality.

In this context, in this paper, as an additional measure of inequality gap., the Lorenz curve is estimated, Figure 6 is the graphical representation of the estimation. Evidently, the visual illustration suggests that the cumulative share of income earned by the bottom 40% of income earners in the Free State, is somewhat, slightly below 10% and has marginal variation across the local municipalities /districts. Interestingly, out of all the local municipalities, Thabo Mofutsanyane has a higher income share in the lower deciles, whereas, Mangaung metropole and Fezile Dabi low income earners has the least share of income. Also, it is worth nothing that, on average, the share of the top 10% income earners is approximately 50% of the entire distribution. Nonetheless, in Lejweleputswa the share is slightly lower than the 50%.

Figure 6: Lorenz Curve: District Municipality In 2014



Data source: Global Insight (2015), Own illustration.

Furthermore, the computing the income share as a percentage of aggregate income across the local municipalities in the Free State for the period 1996 to 2014, reveals Mangaung metropole has the highest income share than other local municipalities/districts (revert to Table 10). In the same vein, population (share) in Mangung metropole quickly outpaced that of the remaining local districts, resultantly leading to the observed decline in income share per capita over the reviewed period as shown in Table 10.

The result from an in-depth analysis of changes in income and population shares of all districts in the Free State over the period of 1996 to 2014 indicates that (see Table 10), Thabo Mofutsanyane (which is historically densely populated local municipality) is currently experiencing steady fall in both population and income shares, however, the latter declines much faster than the former due to a lower income share per individual. All in all, the declining population and low income share is strongly supported by the

evidence of considerable migration from some local municipalities in the province, with the exception of Mangaung and Fezile Dabi. This inference is intuitive since the Mangung metro is mainly an urban area and the main hub of economic activities in the province, meanwhile, there are productive industries (e.g, manufacturing) in Fezile-Dabi municipality. This could explain the lack of population shedding in these provinces compared to the remaining four local municipalities.

Table 10: Population and Income Share

Districts	Share of Population			Share of Income		
	1996	2005	2014	1996	2005	2014
Mangaung	22.9%	25.9%	28%	31.2%	33.7%	35.0%
Xhariep DM	5.5%	5.9%	5.2%	4.4%	5.4%	4.6%
Lejweleputswa DM	26.5%	23.0%	22.9%	19.7%	18.5%	18.5%
Thabo Mofutsanyane DM	28.2%	28.4%	26.3%	21.1%	21.1%	20.8%
Fezile Dabi DM	17.0%	17.3%	18.0%	17.6%	18.3%	19.2%

Data source: Global Insight (2015), Own calculations

[ Insert Table 18 Here, Disparity ratios – Comparing Mangaung Metro to other Municipalities]

Additionally, further cross-municipal analysis of the existing inequality gap in the Free State, by comparing Mangung metropolitan to the remaining five (5) municipalities, estimated as disparity ratio over the period 2005 to 2014. The result of the disparity ratio (tabulated in Table 18, in the appendix) confirmed that in 2006, per capita income in Mangaung metro was 1.7 times higher than income per capita of entire province. Nonetheless, the disparity ratio across the local municipalities relative to Mangung show considerable improvement between 2005 and 2014, of about 1.6 and 1.5 relatively. Phumelela local district has the largest decline in disparity ratio (0.7), followed by Nketoana (0.6), Mohokare (0.6) , Naledi (0.4), and Tokologo (0.4).

[ Insert Table 19 Here, Skewness Number of Income Categories, 2014 ]

Then again, taking into account probable skewness in distribution of income by comparing income categories (per share) across households. From the tabulated results (see Table 19 in the appendix), while the categorised households (per income earned) appear to be normally distributed, there is an emerging income category (R192 000 – R 360 000) that pulls the distribution away from the *mean income* (estimated as R114, 000 per annum) towards the upper end of the distribution, in effect, widening the income gap between low and high income households.

Equally, shifting our analytical lens on income variability in terms of regional structure of income deciles in order to identify incomes concentration at the top of income deciles at the detriment of other middle - and lower- income deciles<sup>20</sup>. From our quantitative analysis (see results in Table 11), it is notable that as of 2014, in the Free State, the percentage share of income in the lower four deciles varies from 7.4% to 9.7% indicating that municipalities such as Mangaung metro and Fezile Dabi's the bottom 40% households has a meagre income share of the total income which is even lower than the targeted income share elucidated in the National Development Plan (NDP,2012).<sup>21</sup> Also, it is worth mention that, the

<sup>20</sup> Decile represents 10 per cent of the population ranked according to income, with the first decile representing the poorest 10 per cent and the tenth decile representing the richest 10 per cent of the population

<sup>21</sup> According to the South Africa's main strategic policy document, NDP, in terms of income share distribution, it is postulated that, ideally the bottom 40% of households should earn at least 10% of total income by 2030.

income share of poorest 40% household in the Mangaung, Fezile Dabi and Lejweleputswa reached 7.4%, 8.1% and 8.5% respectively by 2014, on the contrary, Thabo Mofutsanyane and Xhariep income shares are marginally higher indicating that the poorest 40% households have better share of total income.

Conversely, an explicit focus on the lower most income decile in Free State provides a clear picture of income inequality. Estimated results shows that, roughly about half of the income in the province is received by the top 10% (high income) households. Out of all districts, Fezile Dabi has the highest share of income (48.6%) at the last decile, followed by Mangaung and Thabo Mofutsanyane. Surprisingly, from the inferred results on income distribution per deciles, it may appear that the upper and lower tails of income distribution in the Thabo Mofutsanyane indicates a wide inequality gap, yet the inference from both Gini Coefficient and Palma ratio point towards a relatively small inequality gap compared to local districts.

Table 11: District Decile Income Shares

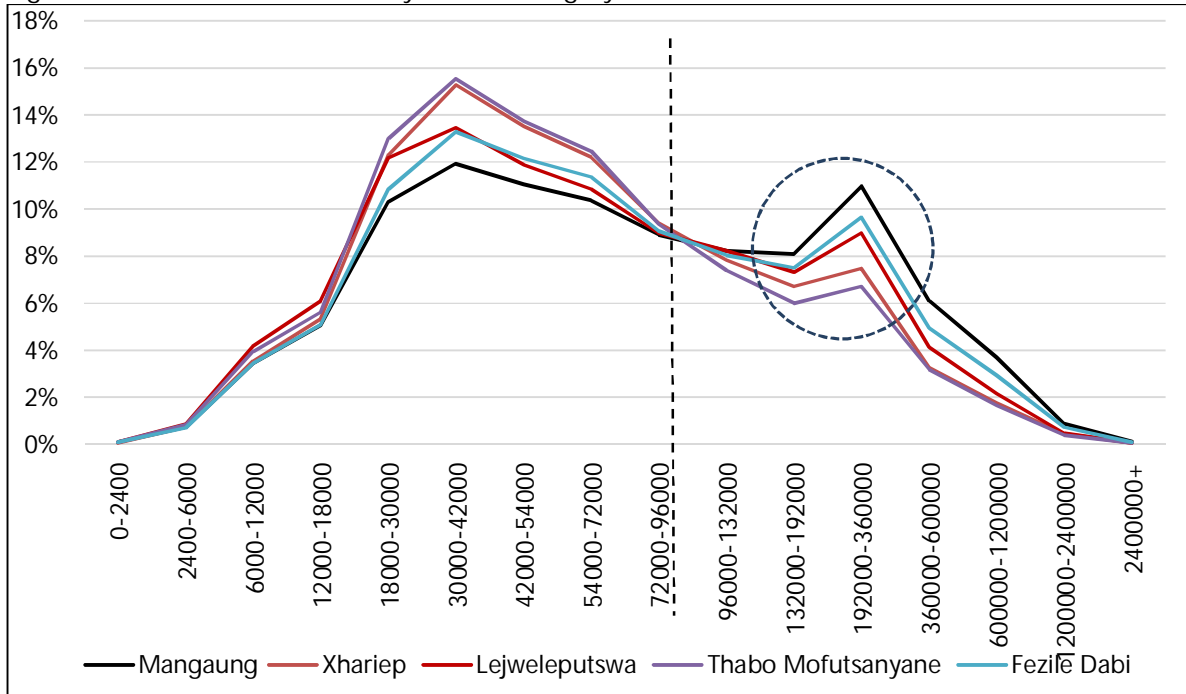
<b>Arbitrary Quintiles</b>	Mangaung	Xhariep	Lejweleputswa	Thabo Mofutsanyane	Fezile Dabi	<b>Free State</b>
0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10%	0.8%	1.1%	0.9%	1.1%	0.9%	0.9%
20%	2.3%	3.2%	2.7%	3.3%	2.6%	2.7%
30%	4.5%	6.1%	5.3%	6.2%	5.1%	5.2%
<b>40%</b>	<b>7.4%</b>	<b>9.6%</b>	<b>8.5%</b>	<b>9.7%</b>	<b>8.1%</b>	<b>8.3%</b>
50%	11.0%	13.8%	12.5%	14.1%	11.9%	12.2%
60%	15.9%	19.2%	17.6%	19.6%	16.8%	17.1%
70%	22.6%	26.1%	24.7%	26.4%	23.5%	23.8%
80%	33.8%	35.4%	35.0%	35.7%	33.4%	33.8%
90%	52.0%	52.6%	53.3%	52.0%	51.4%	51.8%
100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Data source: Global Insight (2015), Own calculations

Visually, Figure 7 displays the shape of the income distribution by all the local districts in the Free State. Evidently, there is a high frequency of households in lower income categories than in higher income categories and hence the distribution appears more skewed to the left. Along the same line, akin to the income deciles analysis, graphical results illustrated by Figure 7, shows a significant concentration of households in lower income categories which is relatively higher, those in the upper income deciles.

Interestingly, a closer look at the upper income categories reveals a “kink shaped” cluster of households earning between R192 000 to 360 000, providing a glaring income inequality between those with and without income. This finding is similar to the result of Leibbrandt et al. (2000). **By and large, in the spirit of Woodlard et al. (2009), based on the analysed results, we conclude that inequality in the (provincial) labour market is largely driven by income disparity, which in turn, can be linked to access to employment opportunities determined by level of skill and education.**

Figure 7: Number of households by income category



Source: Global Insight, 2015

Finally, to ensure a robust analysis on inequality gap in the Free State, this is of utmost importance to benchmark the results of the Gini coefficient analysis with another quantitative measure, in this case, the Palma ratio owed to technical weakness of the former. By computation, the Palma ratio measure income inequality by focusing more on the tails of the income distribution with a postulation that the changes in income/consumption are (almost) exclusively due to gross national income (GNI) of the richest 10 per cent and GNI of poorest 40 per cent since middle group between has a fairly stable distribution which captures approximately 50 percent of gross national income (see, e.g. Cobham et al, 2015).

Following this line of reasoning, the results of both the Palma ratio and Gini coefficient are compared and analysed as presented in Table 12. Focusing explicitly on examining the severity of household inequality across local municipalities / district and the Free State as a whole. The results on inequality gap across the districts shows a widening inequality gap across all the focal municipal districts. Specifically, the Palma ratio shows an increase in inequality gap from 5.2 to 6.6 in Mangaung metro, and 4.7 to 6.0 in Fezile Dabi, an indicative that the richest 10% earn income roughly six times larger than that of the 40% poor (est) households in the province.

On the other hand, also from the results in Table 12, Xhariep and Thabo Mofutsanyane have the inequality lowest ratios in the province indicating a narrowing inequality gap between the high and low income households. Similarly, the Gini Coefficient, also reveals a sizeable deterioration in income inequality in the province. Akin to the Palma ratio results, inequality gap is relatively large (or high) in both Mangaung and Fezile Dabi, whereas, other local municipalities such as Xhariep and Thabo Mofutsanyane have the lowest Gini coefficients, implying less inequality among households.

Table 12: Palma Ratio and Gini by District Municipality

Years	Mangaung	Xhariep	Thabo			Free State
			Lejweleputswa	Mofutsanyane	Fezile Dabi	
<b>Palma Ratio</b>						
1996	5.2	4.4	4.7	4.6	4.7	4.9
2005	7.8	6.8	6.6	6.2	6.6	7.0
2014	6.5	4.9	5.5	5.0	6.0	5.8
<b>Gini Coefficient</b>						
1996	0.58	0.55	0.57	0.56	0.57	0.58
2005	0.64	0.62	0.62	0.61	0.62	0.63
2014	0.62	0.59	0.60	0.58	0.61	0.61

**Source:** Global Insight, 2015; Own estimation

A caveat, the shrinking inequality gap in Xhariep and Thabo Mofutsanyane compared to the apparent widening income distribution in Mangaung and Fezile Dabi should be interpreted with caution owed exogenous factors such as the rural-urban migration, composition of labour market, and the level of geographical development. That is, the high inequality in, especially Mangaung metro could be associated with influx of workers with low skills into the region in search for a better living standard and jobs. In this scenario, the municipality where workers migrated from, would experience declined along the inequality spectrum, since larger proportion of workers remaining are low income earners.

Another possible factor for high inequality in Mangaung could be attributable to the composition of the local labour market, which is forcefully driven by skills level (i.e. more of high skill than low or semi-skills), in such instance, the apparent segmentation in the labour market, as well as, the capital intensive structure tends to attract the few high skilled workers with generous premia (i.e. rent or salaries), while increasing proportion of low skill workers (more that 70% of population in the province) have limited access to the capital – and high-skill intensive labour market. Combined, these conceptual argument explains the apparent worsening inequality gap in Mangaung and Fezile Dabi.

## 5. CONCLUSION AND RECOMMENDATION

By and large, our extensive assessment of poverty incidence and inequality provides an insightful guide for policy makers to design and implement an effective anti-poverty strategies which has the potential to generate employment-intensive growth, stimulate private sector – and infrastructure investments, while promoting equitable income distribution focusing more on upgrading skills of low income workers, with adequate skills acquired through education and/or training, the large proportion of low skill (i.e. low income workers) including majority of the poor, would be able to graduate from low skill sector to high skill sector in the labour market, by building human capital in this way, not only indirectly support an inclusive growth, raise labour productivity, but also has a sizeable impact on poverty reduction and closing the existing inequality gap, since (low skill) workers earn relatively high income in the high skilled labour market sufficient to break the poverty line and live above it. In the spirit of Barro (1991) accumulation of human capital through education (or technical training) has the potential to break the inter-generational transmission of poverty, and close inequality gap via optimal re-distribution of income based on skill and knowledge.

To understand the multi-dimensional characteristics of poverty in Free State, in contrast to previous studies, we decomposed poverty into: (i) headcount ration, (ii) poverty severity and (iii) poverty gap, as well as employed arrays of inequality measuring ratios such as, Theil Index, Lorenz curve, Gini coefficient

and Palma ratio to examine the inequality gap at microeconomic level. In so doing, our analysis covered both quantitative (income, i.e. money metric) and qualitative (human-index) techniques. Adding to this, we evaluate intra-and inter-regional factors contribution to the increasing levels of poverty and inequality among district municipalities. After a thorough review of extant studies, to the best of our knowledge, at regional and international level, this is the first study to attempt an in-depth quantitative analysis on the extent of poverty rate and inequality gap in the Free State.

Empirical results from all the three composite index of poverty suggests that poverty incidence and severity in Free State have decline at an excruciating pace since 1996, however, this decline is not characterized as a sharp decline or reduce the persistently high poverty rate in the province. From our results, for instance, the estimated percentage change in poverty between 1996 and 2005 was roughly -5%, compared to the 12 percent fall in poverty incidence between 2005 and 2014. Noticeably, the apparent decline in poverty incidence could be attributable to the implemented fiscal policy of using a progressive tax system to re-distribute income from rich households to the poor in form of conditional grants (social benefits), which have reduce the rate of extreme poverty in SA (cf. World Bank, 2014), nonetheless, poverty rates remains relatively high due to *intra-regional effects* more than *inter-regional* factors.

Second, strikingly, at local district level, poverty severity is substantially high in rural areas than urban in Free State. For example, using the food poverty line as a benchmark, poverty incidence is the highest in Thabo Mofutsanyane (at 25%), followed by Lejweleputswa (24.5%), Fezile Dabi (21.7%), compared to 18.6% in Mangaung (metropolitan). This inference is critical, since it indicates that the source of persistently high poverty rate in FS can be found in the rural area, where large proportion of the population are poor. By implication, for survival, the high incidence of poverty in rural area could trigger rural-urban migration(as able-bodied poor search for work in the metro), this could lead to over-population in the metro, high crime rates, relentless social protest/unrest associated with demand for job creation, high cost of job search.

Third, at municipal levels, taking into account changes in poverty incidence, empirical evidence indicates that, the overall change in poverty between 1996 and 2005 is mostly attributable to changes *within* the districts, evidenced by the decline in food poverty of 2.3% (1996) and 10.9% (2005), while, the change in poverty between 2005 and 2014 is due to intra-regional factors. In the same vein, over the years, the largest decline in poverty incidence is observed in Thabo Mofutsanya, followed by Lejweleputswa, Fezile Dabi, Xhariep and Mangaung Metro municipality.

Fourth, cross-sectional analysis of all local districts in Free State reveals that poverty gap appeared to be relatively large, ranging from 26.7% (Tokologo) to 28.9% (Masiloyana). Fifth, our qualitative assessment of poverty severity using standard of living as measured by Human Development Index (HDI) indicates an improvement in welfare gain (i.e. better living standards) across all local districts in Free State in terms of adequate provision and accessibility of basic services such as piped water and electricity. In contrast, hygiene toilets are the least accessible basic amenities in the province.

Given, the high correlation between poverty and inequality, we turned our analytical lens on the extent of inequality in the Free State using three inequality measures, specifically Gini coefficient, Palma ratio and Lorenz curve. Our empirical analysis of income distribution shows regional imbalance of wealth and income driven by labour market structure – more capital intensive and high skill oriented. Most importantly, empirical results on the extent of inequality shows that, even though, it appear that there is some moderation in income inequality amongst households, yet, a direct comparison of income per capita of Whites and Africans shows an inequality gap characterized by widening income differential and high skill in the favour of the former.

Meanwhile, on spatial distribution, households living in Mangaung typically earn twice more than those in Thabo Mofutsanyane. Also, taking into account – the “tails of the income distribution”, there is an income concentration at the top of income deciles at the detriment of all other deciles. For example, Income share of the bottom 40% households is less than 10% of total income while nearly 50% of the province income is concentrated at the top income decile. Further decomposition of inequality by inter and intra-regional effects shows that income inequality is driven by income distribution bias in between districts. More specifically, in 2014, 69% of income inequality was attributed to inter-regional effects.

Finally, it is evident that income inequality gap between the affluent and poor households in Free State is shrinking gradually, with the poor households (bottom decile) moving upward the inequality spectrum, while the rich households are shifting downward towards the middle of the spectrum, the latter's wealth dwindles due to paying high taxes into the government coffers, which is re-distributed in the form of social transfers (grants) to the poor households. However, as argued in the literature (see, e.g. Seekings, 2002; Van der berg et al. 2005), the use of social grants as a policy tool to close inequality gap is not sustainable, and less effective because income inequality is the primary objective of such policy, and not skill inequality, also cash transfers only provides risk coping mechanism, which useful for smoothening consumption, but could act as perverse incentive not to engage in labour force (for example, if social grants exceeds labour market reservation wage), and growing dependence on this stream of income exerts enormous fiscal burden on the government.

Apart from jobless (and severely weak) economic growth that do not translate into employment opportunities, given the concrete evidence that inequality is driven by high level of skills / education in the labour market, the provincial government need to intensify its efforts to build (and accumulate) human capital, which is a potent weapon to close the existing skill inequality gap, in effect, lowering income inequality and reduce poverty rate. For example, an effective means of accumulating human capital is by integrating technical trainings into the public employment programmes, and setting up training facilities, where low skill workers (including the poor) can upgrade their skills through accredited technical curriculum.

All in all, our extensive analysis reveals that reducing poverty incidence is not synonymous to fall in poverty rate. Then again, in South Africa (and Free State), by contrast, income inequality has hardly changed despite the introduction of social transfers that now reach 16 million poor South Africans. Inequality remains high partly because the number of jobs created over the past 20 years barely kept pace with growth in the labour force. As a result, unemployment remains between 25 percent and 35 percent depending on whether one counts as being unemployed discouraged workers who have given up looking for a job. Fixing South Africa's education system, is therefore necessary to reduce unemployment and inequality in South Africa. The unemployed will gain access to semi-skilled and skilled jobs only if they are better educated.

At the same time, an increased pool of educated workers will reduce the premia paid to the educated who are currently in short supply. Both poverty and inequality will fall as a result. On the flip side, empirical results asserts that creating job opportunities, though crucial for poverty reduction, will have an impact on reducing overall inequality related to income or quality of skills in demand, which is driven by the distorted labour market.

Therefore, given the growing fiscal deficit, various policy implementation constraints and limited fiscal flexibility space - to reduce poverty incidence and inequality in Free State, and ased on our empirical assessment on the extent of poverty and inequality gap in the Free State, we put forward the following

recommendation for the policy makers to ponder upon. To reduce poverty and inequality, the provincial government must:

- Intensify its efforts to stimulate domestic economic growth by generating jobs opportunity, which in turn, provides stream of income for able bodied employed poor. Such growth inducing and poverty-reducing strategy that draws the unemployed poor into productive work includes the public works programmes and Youth service.
- Re-orient its fiscal allocation and efforts towards other municipalities and local districts different from Mangaung by implementing infrastructural projects needed to stimulate output growth, income growth and reduce inequality gap. Also, targeted focus on developing rural areas where high poverty incidence, unemployment rate and inequality is most prevalent, will allow these triple challenges to be effectively tackle from the root.
- Integrate training and educational curriculum into all public works programmes in order to equip participants with ample skills needed to gain employment in the existing labour market, as well as, encourage self-employment. As such, skill inequality gap would be reduced, while, demand-side constraints in the labour market is removed.
- Ease access to micro-finance facilities to support the establishment of SMMEs, spaza shops and subsistence farming.
- Increase labour market absorption rate by encouraging active participation of the private in sector in creating jobs by providing employment subsidies to employers. This strategy would clear the domestic labour market of excess labour, as well as, improve the productivity gain of additional labour.
- Create technical training centres to upgrade and/or re-skill workers with low skills not actively demanded in the labour market. Such technical training centres should offer accredited trainings in vocational jobs such as artisans, plumbing, brick layering, boiler maker etcetera. By implication, the able-bodied (working) poor is able to access the existing labour market, earn income and be productive.

## REFERENCES

- [1] Ahmed, I., Jahan, N., Fatema-Tuz-Zohora (2014). "Social Safety Net Programme as a mean to alleviate Poverty in Bangladesh". Jagannath University and University of Barisal. Dhaka.
- [2] Agrawal, P., (2008). "Economic Growth and Poverty Reduction: Evidence from Kazakhstan". Asian Development Bank, Delhi. India.
- [3] Akita, T., (2002). "Decomposing Regional Income Inequality using Two-Stage Nested Theil Decomposition Method". No 02/2000, Working Papers, International University of Japan, Niigata, Japan.
- [4] Armstrong, P., Lekezwa, B., and Siebrits, F (2008). "Poverty in South Africa" A profile based on recent household surveys, No 04/2008, Working Papers, Stellenbosch University, Department of Economics
- [5] Bellù, L (2006). "Theil Index and Entropy Class Indexes". University of Urbino, Rome, Italy
- [6] Bellù, L (2006). "Decomposition of Income Inequality by Subgroups". University of Urbino, Rome, Italy
- [7] Foster, J. et al. (1984) 'A class of decomposable poverty measures', *Econometrica*.
- [8] Gumede, V (2010). "Poverty, Inequality and Human Development in a Post-Apartheid South Africa" University of Johannesburg
- [9] Human Sciences Research Council Economic Performance and Development (2014), "State of Poverty of Nine Provinces of South Africa" .March, 2014. Pretoria.
- [10] Leibbrandt, M., Woolard, I., and Woolard, C (2007). "Poverty and Inequality Dynamics in South Africa: Post-apartheid Developments in the Light of the Long-Run Legacy" Prepared for the IPC- DRCLAS workshop, Southern Africa Labour, Development Research Unit and University of Cape Town. Brasilia
- [11] Mbuli, B (2008). "Poverty Reduction Strategies in South Africa". University of South Africa
- [12] Naschold, F., (2002). "Why Inequality Matters for Poverty". Briefing Paper No 2 (2 of 3). March 2002, Overseas Development Institute. London
- [13] Pauw, K., (2004) "Measure of Poverty and Inequality: A Reference Paper". Provincial Decision-Making Enabling (PROVIDE) Project. Western Cape. Elsenburg
- [14] Ravallion, M. and Huppi, Monika (1991) 'Measuring changes in poverty: A Methodological Case Study of Indonesia during an adjustment period', *World Bank Economic Review* 5 (1).
- [15] Statistics South Africa (2014), "Poverty Trends in South Africa: An examination of absolute poverty between 2006 and 2011". March, 2014. Pretoria. Referred to as StatsSA
- [16] Statistics South Africa (2012). "Census 2011 Municipal report Free State" Statistics South Africa. Pretoria.

- [17] Tregenna, F., and Tsela, M (2008). "Inequality, Unemployment and Poverty in South Africa" Trade and Policy Strategies. Pretoria. Available at: [www.tips.org.za](http://www.tips.org.za)
- [18] Van der Berg, S., (2009). "Fiscal incidence of social spending in South Africa" .University of Stellenbosch.
- [19] Woolard, I (2002). "An Overview of Poverty and Inequality in South Africa" Working Paper prepared for DFID (SA), University of Port Elizabeth. Port Elizabeth
- [20] Woolard, I. Leibbrandt, M and McEwen, H (2009). "The persistence of high income inequality in South Africa: Some recent evidence". Institute for Justice and Reconciliation. Wynberg.
- [21] World Bank Institute. (2005). "Introduction to Poverty Analysis".

## TECHNICAL APPENDIX

### APPENDIX A: TABLES

Table 13: Estimated Poverty Line

Poverty Lines			
Years	Food	Lower Bound	Upper Bound
1996	111	162	238
2005	202	289	414
2014	406	548	767

Source: StatsSA (2009)

Table 14: Poverty Measures by Province

	Headcount			Poverty gap			Poverty Severity		
	2006	2009	2011	2006	2009	2011	2006	2009	2011
Western Cape	36,9	35,4	24,7	13,8	13,8	8,5	7,0	7,0	3,9
Eastern Cape	69,5	70,6	60,8	34,1	36,7	27,2	19,7	22,6	15,3
Northern Cape	63,8	63,0	46,8	31,1	29,9	19,1	18,2	17,1	9,9
<b>Free State</b>	<b>53,2</b>	<b>61,9</b>	<b>41,2</b>	<b>22,0</b>	<b>28,4</b>	<b>17,5</b>	<b>11,4</b>	<b>15,8</b>	<b>9,3</b>
KwaZulu-Natal	69,1	65,0	56,6	35,7	33,4	25,5	22,0	20,6	14,4
North West	60,2	61,4	50,5	28,1	29,3	22,6	16,2	17,2	12,6
Gauteng	32,4	33,0	22,9	11,3	13,1	8,1	5,3	6,8	4,1
Mpumalanga	66,3	67,1	52,1	32,0	34,1	21,7	18,8	20,7	11,5
Limpopo	74,4	78,9	63,8	36,8	44,4	30,0	21,9	28,6	17,3
<b>Total (SA)</b>	<b>57,2</b>	<b>56,8</b>	<b>45,5</b>	<b>26,7</b>	<b>27,9</b>	<b>19,6</b>	<b>15,4</b>	<b>16,7</b>	<b>10,8</b>

Source: Statistics SA, 2013

Table 15: District Poverty Estimates

Share below the food poverty line					
	Mangaung	Xhariep	Lejweleputswa	Thabo Mofutsanyane	Fezile Dabi
1996	26.40%	41.90%	35.80%	43.10%	34.80%
2005	27.40%	34.50%	34.70%	39.90%	32.30%
2014	18.60%	21.30%	24.50%	25.00%	21.70%
Change(1996-2005)	1.00%	-7.40%	-1.10%	-3.20%	-2.50%
Change(2005-2014)	-8.80%	-13.20%	-10.20%	-14.90%	-10.60%
Share below the lower bound poverty line					
1996	41.40%	59.80%	52.70%	61.20%	51.50%
2005	39.30%	47.90%	48.20%	54.50%	45.40%
2014	28.90%	33.60%	36.50%	38.10%	33.40%
Change(1996-2005)	-2.10%	-11.90%	-4.50%	-6.70%	-6.10%
Change(2005-2014)	-10.40%	-14.30%	-11.70%	-16.40%	-12.00%
Share below the upper bound poverty line					
1996	55.50%	73.50%	66.90%	75.10%	64.90%
2005	51.20%	60.90%	60.80%	67.40%	57.60%
2014	40.50%	47.40%	49.20%	52.00%	46.00%
Change(1996-2005)	-4.30%	-12.60%	-6.10%	-7.70%	-7.30%
Change(2005-2014)	-10.70%	-13.50%	-11.60%	-15.40%	-11.60%

Source: Global Insight (2015), Own calculations

Table 16: Closing the Gap

<b>Municipality / Districts</b>	<b>Population</b>	<b>Poverty gap rate (from upper poverty line)</b>	<b>Minimum costs</b>
<b>Mangaung Metro</b>	<b>786,020</b>	27.1%	<b>R 163,143,118</b>
<b>Thabo Mofutsanyane</b>	<b>737,761</b>	<b>27.2%</b>	<b>R 153,006,161</b>
Maluti a Phofung	111,977	28.0%	R 24,064,651
Dihlabeng	131,114	26.3%	R 26,497,084
Setsoto	61,144	27.9%	R 13,084,315
Nketoana	334,428	26.8%	R 68,772,367
Mantsopa	48,251	26.8%	R 9,925,261
Phumelela	50,848	27.3%	R 10,662,483
<b>Lejweleputswa</b>	<b>630,912</b>	27.8%	<b>R 133,996,718</b>
Matjhabeng	64,342	27.9%	R 13,775,683
Nala	28,638	28.0%	R 6,142,315
Masilonyana	46,960	28.9%	R 10,403,221
Tswelopele	412,391	27.7%	R 87,604,855
Tokologo	78,581	26.7%	R 16,070,645
<b>Fezile Dabi</b>	<b>504,489</b>	27.3%	<b>R 105,858,912</b>
Metsimaholo	161,972	27.5%	R 34,141,810
Moqhaka	123,614	27.0%	R 25,593,015
Ngwathe	160,099	27.5%	R 33,795,312
Mafube	58,804	27.3%	R 12,328,775
<b>Xhariep</b>	<b>145,780</b>	26.9%	<b>R 29,860,306</b>
Kopanong	38,615	27.1%	R 8,030,362
Letsemeng	48,901	25.7%	R 9,639,526
Mohokare	34,270	27.2%	R 7,139,219
Naledi	23,994	27.4%	R 5,051,199
<b>Free State</b>	<b>2,804,961</b>	<b>27.4%</b>	<b>R 585,865,215</b>

Source: Global Insight, 2015, Own Estimation,

Table 17 : Qualitative Poverty Measures

Years	Mangaung	Xhariep	Lejweleputswa	Thabo Mofutsanyane	Fezile Dabi
<b>Functional literacy: age 15+, completed grade 7 or higher</b>					
1996	73.6%	53.0%	64.3%	62.7%	66.9%
2005	78.2%	60.6%	71.1%	68.9%	72.9%
2014	86.3%	72.9%	81.8%	79.3%	82.0%
<b>Share of households occupying formal dwellings</b>					
1996	74.6%	80.8%	60.9%	60.7%	66.4%
2005	78.5%	83.5%	66.5%	69.1%	73.3%
2014	86.2%	86.5%	81.8%	77.0%	85.4%
<b>Share of households with Hygienic toilets (%)</b>					
1996	62.4%	56.3%	57.0%	35.5%	62.6%
2005	72.4%	76.8%	66.0%	50.4%	78.1%
2014	85.5%	87.1%	85.2%	70.5%	85.2%
<b>Share of households with piped water at or above RDP-level (%)</b>					
1996	90.6%	90.2%	91.6%	85.9%	90.6%
2005	92.0%	91.8%	92.2%	89.3%	94.4%
2014	95.1%	92.8%	94.5%	91.5%	94.5%
<b>Share of households with electrical connections (%)</b>					
1996	74.8%	81.0%	76.9%	55.8%	67.8%
2005	88.7%	86.1%	84.1%	77.9%	87.0%
2014	93.2%	94.8%	93.1%	89.5%	91.2%
<b>Refuse removal</b>					
1996	70.8%	64.0%	77.1%	41.6%	66.2%
2005	74.4%	71.7%	77.7%	50.8%	78.8%
2014	84.4%	74.1%	85.7%	55.1%	85.2%

Source: Global Insight, 2015, Own Estimation,

Table 18: Disparity ratios – Comparing Mangaung Metro to other Municipalities

LOCAL MUNICIPALITY	2005	2009	2014	DISTRICT MUNICIPALITY
Letsemeng	1.5	1.4	1.2	Xhariep
Kopanong	1.6	1.4	1.6	
Mohokare	1.9	1.6	1.4	
Naledi	2.0	1.6	1.5	
Masilonyana	1.9	1.7	2.1	Lejweleputswa
Tokologo	1.8	1.5	1.4	
Tswelopele	1.9	2.3	1.6	
Matjhabeng	1.2	1.3	1.2	
Nala	1.9	2.0	1.8	
Setsoto	1.8	1.9	1.6	Thabo Mofutsanyane
Dihlabeng	1.3	1.3	1.2	
Nketoana	2.0	1.9	1.4	
Maluti a Phofung	2.0	2.1	1.9	
Phumelela	2.3	1.9	1.6	
Mantsopa	1.7	1.5	1.4	
Moqhaka	1.5	1.3	1.4	Fezile Dabi
Ngwathe	1.6	1.5	1.4	
Metsimaholo	0.8	0.9	0.9	
Mafube	1.8	1.8	1.5	

Own Estimation, data source: Global Insight (2015)

Table 19: Number of Income Categories, 2014

Income Categories	Mangaung Metro	District Municipality			
		Xhariep DM	Lejweleputswa DM	Mofutsanyane DM	Fezile Dabi DM
0-2400	0.1%	0.1%	0.1%	0.1%	0.1%
2400-6000	0.7%	0.7%	0.9%	0.8%	0.7%
6000-12000	3.4%	3.6%	4.2%	4.0%	3.5%
12000-18000	5.0%	5.3%	6.1%	5.6%	5.1%
18000-30000	10.3%	12.3%	12.2%	13.0%	10.9%
30000-42000	11.9%	15.3%	13.4%	15.5%	13.3%
42000-54000	11.1%	13.5%	11.9%	13.7%	12.2%
54000-72000	10.4%	12.2%	10.8%	12.5%	11.4%
72000-96000	8.9%	9.4%	9.0%	9.4%	9.1%
96000-132000	8.2%	7.8%	8.2%	7.4%	8.0%
132000-192000	8.1%	6.7%	7.3%	6.0%	7.5%
<b>192000-360000</b>	<b>11.0%</b>	<b>7.5%</b>	<b>9.0%</b>	<b>6.7%</b>	<b>9.7%</b>
360000-600000	6.1%	3.3%	4.1%	3.2%	4.9%
600000-1200000	3.7%	1.8%	2.2%	1.7%	2.9%
1200000-2400000	0.9%	0.5%	0.5%	0.4%	0.7%
2400000+	0.1%	0.1%	0.1%	0.1%	0.1%

Own Estimation, data source: Global Insight (2015)

---

**OTHER RESEARCH PAPERS BY THE AUTHOR.**

- [1] Mashibini, G.G., Mokalanyane, N.D., and Omoshoro-Jones, O.S (2013), "Evaluating Fiscal Multiplier Effects on the Free State Economy: A Social Accounting Matrix Approach. Economic Analysis Directorate Staff Research Paper No. 3, Free State Provincial Treasury. Bloemfontein. A paper presented at the 5th Annual Public Sector Economists' Forum (PSEF), Cradle of Humankind Conference Centre, Maropeng, Magaliesburg, 27th – 29th Nov. 2013, Gauteng.
-