The Impact of Financial Development on Income Inequality

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ABSTRACT

The need to reduce income inequality occupies the attention of policymakers and researchers around the world. However, there is no consensus in the literature about the nature of the relationship between Financial Development (FD) and income inequality. Therefore, this thesis contributes to the debate by evaluating the impact of FD on income inequality in South Africa. It focuses on the test of financial Kuznets curve Hypothesis. Using yearly series from 1975 to 2018, the thesis employed Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) unit root tests, Johansen cointegration test, Granger causality and fully modified OLS (FMOLS) regression technique. The findings reveal that the relationship between FD and income inequality is negative, whereas its square positively relates to income inequality in South Africa. This indicates the existence of U-shape (inverted Kuznets curve) relationship between FD and income inequality. The turning point is found to be about 4.47%. This thesis therefore, concludes that FD is a significant determinant of income distribution and its impact is contingent upon the stage of FD and income inequality in South Africa. It is thus recommended that policymakers in South Africa and probably other emerging markets should prioritize the development of financial sector, entrench policies that promote economic growth, embrace economic liberalization with caution, adopt expansionary fiscal policies and control inflation to reduce income inequality in the country.

Keywords: Income inequality; Financial development; Economic growth; Economic globalization; Time series analysis

ÖZ

Gelir eşitsizliğinin azaltılmasını duyulan ihtiyaç, dünya çapındaki hükümet yetkilileri ve araştırmacıların dikkatini çekmektedir. Ancak, literatürde Finansal Gelişim (FD) ile gelir eşitsizliği arasındaki ilişkinin niteliği konusunda herhangi bir fikir birliği yoktur. Bu sebeple, bu çalışma FD'nin, Güney Afrika'daki gelir eşitsizliği üzerindeki etkisini inceleyerek bu tartışmaya katkıda bulunmaktadır. Finansal Kuznets hipotez eğrisi üzerinde odaklanılmıştır. Çalışmada 1975'ten 2018'e olan yıllık seriler kullanılarak, Augmented Dickey Fuller (ADF) ve Phillips-Perron (PP) birim kök testi, Johansen eş-bütünleşme testi, Granger nedensellik ve tamamen değiştirilmiş OLS (FMOLS) gerileme tekniği kullanılmıştır. Sonuçlar, FD ve gelir eşitsizliği arasında negatif bir ilişki olduğunu ortaya çıkarmıştır fakat Güney Afrika'daki gelir eşitsizliği ile pozitif olarak ilişkilendirilmiştir. Buna göre FD ile gelir eşitsizliği arasındaki ilişkinin U (ters Kuznets eğirisi) şeklinde olduğunu göstermektedir. Kuznet eğrisinin dönüş noktası 4.47% olarak tespit edilmiştir. Bu yüzden bu çalışma, FD'nin gelir dağılımında önemli bir belirleyici olduğunu ve Güney Afrika'daki FD ve etkisinin Güney Afrika'da FD aşamasına ve gelir eşitsizliğine bağlı olduğunu göstermektedir. Bu yüzden, Güney Afrika'daki hükümet yetkiliklerinin ve diğer büyüyen pazarların, finansal sektörün büyümesine, ekonomik büyümeyi teşvik eden politikalara katılmaya, ekonomik serbestleşmeyi benimsemeye, genişleyen mali politikaları benimsemeye ve ülkedeki gelir eşitsizliğini azaltmak için enflasyonu kontrol etmeye öncelik verilmesi gerektiği önerilmektedir.

Anahtar Kelimeler: Gelir eşitsizliği; Finansal gelişim; Ekonomik büyüme; Ekonomik küreselleşme; Zaman serisi analizi

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LIST OF ABBREVAITIONS

ADF	Augmented Dickey-Fuller
FD	Financial Development
FMOSL	Fully Modified Ordinary Least Square
OECD	The Organization for Economic Co-operation and Development
OLS	Ordinary Least Square
PP	Philips-Perron
SA	Sauth Africa

Chapter 1

INTRODUCTION

Income inequality commonly refers to a situation where the distribution of wages, salaries and wealth at large are uneven among the societal class. By inequality, this thesis aligns with the literature in settling on income distribution as a proxy for both relative income and equality of opportunity in measuring inequality as these would affect the overall welfare of individuals (Greenwood & Jovanovic, 1990). Similar to fairness, equality is an important societal value that matters to all irrespective of each's individual background. A lack of equality could signal income immobility or lack of equal opportunities thus creating a persistent disadvantage for certain classes of the society (Dabla-Norris et al., 2015). Very often, when referring to income inequality the attention particularly draws to the extent of disparity between the upper and the lower income earning class. In the event where this disparity is significant, among many others, the common observation would be a greater possibility for the economy to experience persistency in income inequality resulting in slower economic growth and non-optimized levels of living standards (Demirgüç-Kunt & Levine, 2009)

Inequality as a growing economic concern has gained considerable grounds both within individual countries and on a global scale. Prior to the global economic crisis, it was observed that household real disposable income had grown by an average of 1.7% per annum in most developed and developing countries (OECD, 2011). However, this growth in household income was characterized by a faster growth for

the 10% richest contrast to the 10% poorest, resulting in further income inequality. An enlarging income inequality gap have various negative implications which when put together would ultimately lead to worsening socio-political and economic conditions such as, economic injustice, financial crises (Stiglitz, 2009; Gur & Bjørnskov, 2017), as well as instability in the socio-political sphere (Nollert, 1995; Boix, 2008; Solt, 2015). Increasing income inequality is therefore a global economic concern and remains the subject of ongoing debate among various policymakers and economists (Rupert, 2012).

Attempts to remediate the problem of income inequality has motivated a surge in the literature on financial development (FD) and income inequality with primary focus on the potential impacts of FD on the later. Originally established by Kuznets (1955), the core argument underlying the nexus between FD and income inequality posits that there is a non-linear relationship or inverted U-shape. The argument supporting the nature of this relationship states that at initial stages of development, the tendency is for an increasing disparity in the distribution of income due to the speed of urbanization from technological advancement and financial sophistication which the more privileged find easier to access. However, this disparity narrows during the intermediate stages of development as the economy matures and the effects of urbanization spill over to the whole society allowing the former less privileged better access to credit and a well-functioning financial system, thus increasing their capacity to participate in business activities causing a fall in income inequality (Greenwood & Jovanovich, 1990). Also in support of Kuznets's argument is the idea that the distributive impacts of financial intermediation are more effective in the event of technological progress and financial innovation as this would reduce information

asymmetry, increase the efficiency of markets and contribute to the overall economic growth (Laeven et al. 2015; Beck et al., 2000). Baiardi and Morana (2016) went further by modeling an inverted Kuznets curve with a turning point conditioned upon the level of FD that was found significant and termed it as the "Financial Kuznets Curve". As such, despite the common belief that FD is mainly effective in reducing income inequality for advance economies, the reality depends on the stage of each country's economic development (Jung & Vijverberg, 2019).

Another factor frequently addressed on its implications on income inequality given its significant increase over the time is globalization. Globalization stretches across many dimensions with its main drivers including the liberalization of trade, capital flows, the degree of financial integration, international migration and financial openness. (Asteriou et al., 2014). The implications of its multi-dimensional nature give rise to surging debates on the exact implication for the level of income inequality within and across countries. Despite some studies suggesting a positive link between globalization and income inequality, most empirical works investigating this relationship portray significant evidence in favor a negative relationship for both developing and developed countries (Beck et al., 2007; Goldberg-Koujianou & Pavcnik, 2007; Dollar & Kraay, 2004). One of the early views supporting this positive relationship argues that via the channel of financial systems, poor countries would not be able to compete with their richer counter parts in the event of integrated financial markets thus magnifying income inequality (Lewis, 1977). Embedded in this school of thought, are some views asserting that globalization via the means of financial liberalization and integration has ameliorated the overall level of income thus narrowing the inequality gap (Mills, 2008). Meanwhile other views insist on the uneven distribution of the benefits of

globalization leading to more inequality across nations due to each nation's limited infrastructural capacity in absorbing the benefits globalization. Also, after reviewing a considerable number of studies on the effects of trade openness on the distribution of income, Kraay (2006) and Goldberg-Koujianou and Pavcnik (2007) came to an unsettled conclusion and suggested that the extent to which globalization affect inequality are dependent on each country's case and time specific characteristics such as the degree of capital mobility and trade liberalization in domestic markets.

High levels of income inequality could also be a sign of failure on the part of fiscal authorities in performing its redistributive task. For instance, by proper use of taxes and transfers the government can adjust undesired socially distributive income outcomes created from the prevailing market forces (Musgrave, 1959). When inequality peaks beyond socially desired thresholds, evidence from surveys suggest that the government could respond to this in a couple of ways. It could either respond by looking addressing the cause in seeking to improve the equality of opportunities via education and health programs which are quite unrealistic when seeking short term payoffs. Or, it can address this with some fiscal reforms that would aim at narrowing the level of income inequality (Goñi et al., 2011). Also, higher inequality will reduce the impact that growth in aggregate income will have on poverty by requiring a faster pace of growth to enable poverty reduction. The resulting effect of this condition is a vicious circle of poverty and stagnation in which a number of developed countries might get stuck in (Goñi et. al., 2011). As a result, a considerable amount of studies supports the adoption of progressive tax policies in funding government expenditures as this has proven to lessen income inequality via redistributive mechanisms (Oishi et al., 2018; Corneo & Schröder, 2018; Lustig, 2016; Benabou & Ok, 2001; Lambert,

1992). Also, government transfers that are channeled towards social facilities such as education, health and securities are believed to narrow the smoothen the income distribution gap. In general, the fiscal method employed by governments can serve as effective tools in reducing income inequality as proper government spending is a suitable tool in the absence of corrupt institutionalizations.

Furthermore, there are numerous evidences attesting to the presence of a strong positive relationship between income inequality and inflation. The nature of this relation emanates from the idea that inflation magnifies the vulnerability of low-income households (Albanesi, 2007). In the same light, Bulíř (2001) argues that inflation worsens the income inequality gap in various ways; 1) by redistributing income across the segment of the population with those who have cautioned their wealth and stream of income against inflation risk becoming relatively richer than the segment who has not; 2) by decreasing the overall level with the lower class being more vulnerable and 3) by mitigating the effects of the governmental distributive efforts given that the amount of transfers in a progressive taxed society would not be enough to cater for the unprotected segment of the population considering that the upper economic class usually outnumbers the lower class.

South Africa (SA) has made tangible progress towards becoming a more equitable society since its liberation from the apartheid system in the year 1948. Most especially, equality in opportunities have seen a surge on the segregated lower classes with the advent of electrification and improved access to education (World Bank, 2012). Some other factors responsible for this progress include, wider security networks, growth in real income, and further access to basic credit and housing facilities. Also, the percentage of people living under the poverty line declined by 7 percent and Gini

coefficients equally fell by 0.02 between the years 2006 to 2011. Despite this, South Africa, a country ranked as an upper middle-income economy, still experiences pervasive poverty and income inequality with one of the highest Gini coefficient of 0.64 in 2014. In fact, as of 2011 SA's top 20% population were responsible for up to 61.3 % of the nation's consumption a share not to be compared with the little 4.3% accounted by the lower 20% (World Bank, 2012). The study of Zikhali (2016) confirms these substantial poverty levels in SA as they indicate that an estimated 20 million South Africans are considered poor. It is therefore a primary concern for the SA policy makers to address this issue.

It is worth noting that SA has a well-developed and established financial sector as per international standards. The competitive survey carried by the World Economic Forum in 2012 revealed SA banks ranked as third worldwide in terms of soundness. Also, its stock market occupies the 17th position worldwide and is said to be developed with the bond market been very liquid (Kapingura & Alagidede, 2016). These financial attributes and persistent inequality pose an interesting case for testing the validity of the financial Kuznets curve for this type of economy.

Despite the plethora of studies, plausible empirical explanation is yet to be provided on the impact of on income inequality especially in South Africa. In addition, the test of the financial Kuznets curve hypothesis is a novelty in this work. Therefore, the major objective of this is to evaluate how FD affects income distribution using the financial Kuznets curve hypothesis as framework, to control for the effects of globalization, government policy and inflation in our model specification. This thesis employs time series data and methodology in deriving our estimations. The results obtain shall also be used for comparisons with similar cases done in SA, but that

focused more on different distributive impacts rather FD such the work of Maboshe et al. (2018) who laid main emphasis on the distributive impact of taxes.

The remaining sections will be divided as follows: the next chapter will review the theoretical and empirical literature on income inequality and its linkage to FD, economic growth, globalization, inflation and government expenditures. Following up is the methodology in chapter 3 after which's present the estimation results in chapter 4 and finally chapter 5 provides the conclusion and policy recommendation.

Chapter 2

LITERATURE REVIEW

The history of income distribution has most often been discussed alongside the event of economic growth. Kuznets (1955) is often credit with providing the historical and theoretical foundation in understanding the effect of income inequality on various economies. Kuznets conducted his study on the United Kingdom and Germany which were considered as industrial economies at the time and stylized his observations in the form of an inverted U-shape. In his work, he described the long term relation between growth and income distribution as a subset of three main stages where income inequality initially grows due to positive shocks in labor wages for skilled workers in the initial stages of growth creating further inequality gap with the unskilled laborers. However, he argues that this process evens out as the process of industrialization and economic growth spreads out to rural areas and with the adoption of incentives such as education and technological progress and inequality will eventually fall.

After Kuznets' work, the late 60s to early 90s saw an influx of studies attempting to test the inverted U-shaped hypothesis or re-evaluate the income inequality- growth nexus. Among these, were those done by Kravis (1960) and Stiglitz (1969) who confirmed rising uneven distribution of income at early development stages. Meanwhile, Ahluwalia (1976) extended this hypothesis to a sample of sixty countries divided into rich, poor and median and found the right portion of the Kuznets curve to be the most robust as inequality was observed to decrease with economic development.

Ever since then more studies (Ahluwalia, 1976; Blanco & Ram, 2019; Chiu & Lee, 2019; Lee, 2006; Onaran & Oyvat, 2016; Papanek & Kyn, 1986; Paukert, 1973; Shahbaz, 2010; Treillet, 1999; Zhou & Li, 2011) have provided reports in support of Kuznets work.

However, the validity of the Kuznets hypothesis was questioned by other studies which argued on it relevance for less developed economies where it had lacked to prove significant. In this regard, Li and Zou (1998) refuted Kuznets curve and instead proposed a U-shaped relation as a best fit given that increases in income inequality was inevitable at the later stages when introducing temporal dimension into the model. This idea was embraced by the work of Bowman (1997) and Deiniger and Squire (1996) who all found conflicting results in different economies, thereby concluding of the insufficiency of the Kuznets alone in explaining the growth income nexus. Later on, few studies started to question what happens after the inverted U-shape (Piketty & Saez, 2014).

Despite the criticism on Kuznets work, what remains is its theoretical basis which provides further development and understanding for the process of economic growth especially developing economies. Recent supporters of Kuznets' work include among many, Blanco and Ram (2019); Chiu and Lee (2019), Cheng and Wu (2017), Oyvat (2015), Shahbaz (2010), Zhou and Li (2011).

2.1 The Relationship Between Income Inequality and Economic Growth

The nexus between economic growth and income inequality is quite ambiguous as ongoing debate persists regarding the exact nature of their interaction. Most empirical

studies have confirmed the existence of a strong correlation and long run relationship between these two variables (Sbaouelgi & Boulila, 2013). When combine the vast amount of research done so far, there is no consensus on the sign and causal direction of these variables due to numerous contrasting results. Theoretically, income inequality and economic growth could have a bi-directional causal relation depending on several mechanisms. Some studies have found a positive, negative and no relationship, while most studies have non-monotonic interactions. These mixtures in findings have left numerous loopholes in the research community with many wonderings on the implications of economic growth on the distribution of income. Meanwhile empirically, the sharp contrast reported in the cross-country literature portray both positive and negative significant results, leaving with the conclusion that the sign of the coefficients are highly sensitive to the quality of data, length of estimation period, model specification and the estimation technique used in analyzing the data (Forbes, 2000).

Many studies, including that of Ahluwalia (1976), Paukert (1973), Cheng and Wu (2017), Onaran and Oyvat (2015), Shahbaz (2010), Zhou and Li (2011), yielded results in support of Kuznets' (1955) inverted U-shape using different data sets including, cross-sectional, panel and time series data sets. For instance, Paukert (1973) initiated cross-sectional analysis in this field by comparing the average per capita income to the Gini coefficients of 56 countries among which 43 were developing countries, his results displayed in tabular form demonstrated a clear inverted U-pattern. Paukert's (1973) work was later extended by Ahluwalia (1976) who used multivariate cross-sectional regression and extended the sample size to 62 countries, again, yielding similar results. However, given the limited data in the mid-1900s, and the limitations

of cross-sectional data analysis, these early studies were unsuitable in directly testing Kuznets' hypothesis as they only questioned whether income inequality rose or declined with increases in income in a country and subjected the results for cross comparability.

It was not until the late 1990's that the availability of adequate data set enabled researchers such as Deininger and Squire (1996) to apply panel data methodology in inquiring and confirming Kuznets' claims. Deininger and Squire's (1996) large data set of 108 countries provided a cornerstone for many researchers' including Thornton (2001), List and Gallet (1999) who confirmed and inverted U-pattern for at least 96 countries. However, using the same data set, Barro (2000) concluded that the inverted u-pattern disappears after accounting for country fixed-effects. Barro (2000) showed that unequal distribution of income slowed economic growth in developing countries such as those in South America contrast to countries like France where this process was accelerated.

There are early studies such as Kaldor (1957) and Keynes (1920) claiming that income inequality has a monotonic positive impact on economic growth mainly via capital accumulation because of the wealth channeled to the richer population segment who have a smaller propensity to consume. According to Okun et al. (1975), seeking income equality would also be detrimental to economic efficiency. For instance, in the event of high inequality, the argument is that incentives for hard work and the undertaking of risky but highly lucrative investments will boosting economic activities (Lazear & Rosen, 1981). For instance, if the more educated segment of the population enjoys returns from economic activities that differ largely, this will create an incentive towards the acquisition of education (Bourguignon, 1981). Bourguignon (1981)

pushes this argument a little further by insisting on the inevitability and necessity for income inequality during the process of economic growth as an increased propensity to save mostly prompted from the wealthiest individuals is fundamental to the process of economic growth. This argument is however unlikely true for less developed countries which offer no evidence of increased propensity to save among higher income earners (Kuznets, 1955). Then there is the argument that for economic activities and technological progress to be fostered, there is a need for more concentration of wealth among certain individuals due to the need for large contrast to small scale investments in boosting economic activities (Bahmani-Oskooee & Motavallizadeh-Ardakani, 2018).

Of recent, the availability of data has led to the emergence of further studies investigating and confirming the inverted U-shaped hypothesis between income inequality and economic development using time series methodology. For instance, Bahmani et al. (2008) applied the Autoregressive Distributed Lags (ARDL) estimation technique to examine the Kuznets curve in United States for the period of 1957 – 2002 and found that the short run effects of inequality were detrimental to growth whereas in the long run, this effects seemed to fade out. This observation however could not be confirmed when Bahmani et al. (2008) performed the same study for a data set of sixteen countries. Meanwhile, Shahbaz (2010) incorporated cubic and quadratic specification of per capita income using ARDL estimation and concluded strongly in favor of an inverted U-shape and S-pattern. Shahbaz (2010) indicates that urbanization strongly enables improvements in income distribution whereas human development and unemployment have the opposite effect in the long run. Also, a number of studies has been conducted in China giving its characteristics of high growth and high Gini

figures. Using the ARDL technique, Jalil (2012) and Cheng and Wu (2017) find strong evidence for an inverted U-shape and both studies find urbanization to be a major driver of inequality in China. Lastly, the work of Yang and Greaney (2017) looked at the growth- inequality nexus in United States, China, Japan and South Korea and their results showed and inverted-u pattern for South Korea and Japan whereas U.S and China illustrated a S-pattern over the period of 1960 to 2014.

Furthermore, a considerable amount of research posits that the relationship between economic growth and income inequality is negative (Barro, 2008; Dalton, 1920; Deininger & Squire, 1996; Helpman et al., 2010; Persson & Tabellini, 1994; Rajan, 2010; Tachibanaki, 2005; Wahiba & El Weriemmi, 2014). Due to numerous factors such as lack of credit accessibility that constraint low income individuals from participating in boosting economic activities economic growth is thought to cause a decline in income inequality most especially in the long term (Wahiba & El Weriemmi, 2014; Rajan, 2010). For instance, according to Dalton's (1920) principle of transfer, increase in economic growth could lead to reductions in income inequality in the event of state enabled transfer policies from the wealthy to the poor. Also, Wahiba and El Weriemmi (2014) found that income inequality negatively affected economic growth unlike the FD and trade openness which had positive effects. Meanwhile, Rajan (2010) suggest the idea that increasing inequality would augment the likelihood of would be detrimental to growth in the long run due to the increase probability of banking crises. Barro (2008) however, finds this negative effect of growth on income inequality to be less persistent as GDP per capita also increased. Generally, most studies advocating for economic growth as a means of equalizing income distribution support measures

such as trade openness, macro prudential policies and fiscal discipline in stabilizing income distribution.

A few studies found either unsettled or no strong evidence of an existing nexus between growth and uneven income distribution. For instance, Tam (2008) showed that Kuznets curve could assume non monotonic or monotonic shapes depending on their specifications using a sample of 84 countries over twenty years. Bahmani-Oskoee et al. (2008) revisited the inverted U-hypothesis for a panel of 16 countries using the ARDL technique to observe the effect of trade openness and found that 5 of these countries showed no strong evidence supporting the economic growth-income inequality relation.

Lastly, despite the numerous divergences in empirical findings on the relation between inequality and growth, one thing is consistent and that is the significance of this relationship across studies. After reviewing a wide data set of countries with the help of non-parametric techniques robust to varying control variable, Banerje and. Duflo (2003) still found an inverted U-shape to properly represent net changes in inequality over time. They argue that a sure observation in their analysis is the non-linearity of this relationship which would be a plausible explanation for the inconsistent findings in the body of empirical research. Still, from empirical observation U-shape seems to be the most appealing on the subject.

2.2 The Relationship between FD and Inequality

Attention has increasingly been given to understanding the impact of FD on income inequality, with many conflicting arguments on both theoretical stances and empirical findings. Theory wise, Greenwood and Jovanovic (1990) classify the theoretical

predictions into intensive and extensive margins. By extensive margins the reference is to the users of financial services with no prior financial knowledge or experience (Demirgüç-Kunt & Levine, 2009). With much of the literature focusing on the extensive margin, the argument is that the cost of transaction and obtaining information might be more burdensome for the poor who most often hold inadequate collateral and no credit history (Beck et al., 2007). Supporting this idea are several models (Becker & Tomes, 1979; Galor & Moav, 2004) that lay emphasis on the cost of transaction and information as means of financing education. According to this model, the constraint experienced by the poor incapacitates the ability to accumulate wealth and reduces the economic opportunities of these families creating even more inequality in the process of FD. Other models like that of Jacoby and Skoufias (1997) rather advocate for education in reducing adverse income shocks. In this case, financial market shocks might transfer to family income causing parents to engage their children in income earning activities. Still looking at the extensive margin, poor entrepreneurs with no credit history nor collateral but good business ideas are less likely to receive financial support than the rich who already have enough capital accumulated (Bardhan et al., 2000). These mechanisms are often addressed in the literature but are not the only ones.

There is also the intensive margin in which FD is viewed to affect income inequality differently. Unlike in the extensive view, here, FD is not mainly viewed as increasing the access to financial services but to also improve the experience and quality of financial services provided to the purchasers (Greenwood & Jovanovic, 1990). In this view, the benefits of FD will likely and primarily accrue to the existing users of those services that include firms and households. In this case benefits which will mostly be

enjoyed by the upper income class and this will likely result in an increase in the level of income inequality and disparities in economic opportunities. However, Demirgüç-Kunt and Levine (2009) argued that even in the event where an intensive margin form of FD increases inequality, dynamics such as improved efficiency in resource allocation, increase in wage rates and economic growth acceleration will likely reduce these negative effects creating some form of equilibrium.

Also, FD via the channel of economic opportunities and outcomes could alter the distribution of income without the direct use of financial services (Beck et al., 2009; Townsend & Ueda, 2006). In this scenario, the process of FD will boost economic activities hence creating further demand opportunities for labor. The main argument would however depend on the kind of labor demand that would arise from these activities. In the case where demand is mostly for skilled labor over non skilled labor, the results would be an increase in income inequality and vice versa in an opposite scenario (Jerzmanowski & Nabar, 2013). Though theoretically the greater inclination is towards the extensive margin, the theory on the impact of FD on inequality remains ambiguous.

Most empirical studies report that countries with better FD experience less income inequality (De Haan & Sturm, 2017; Zhang & Naceur, 2019; Kunieda et al., 2014; Hamori & Hashiguchi, 2012; Beck et al., 2007; Li et al., 1998). Meanwhile, some studies submit nonlinear association between FD and inequality, and unless a country attains a certain level of threshold of FD the benefits of FD on income inequality would not be observed (Law et al., 2014; Kim & Lin, 2011). Once the threshold is attained, FD is observed to reduce income inequality. Other studies like that of Oskooee and Zhang (2015) report mixed findings as only 3 out of 10 countries investigated showed

that FD had short had equalizing effects on income distribution though the effects are shown to last long. Lastly, a considerable number of research report that FD increases the level of inequality (Dabla-Norris et al., 2015; Li & Yu, 2014; Jauch & Watzka, 2016).

Most studies however do not explore the transmission mechanisms from finance to inequality. Gimet and Lagoarde-Segot (2011) tried to identify the main channels linking income inequality, capital markets and banks. They seek to pinpoint the determinants of income inequality using indicators that include bank size, market capitalization, international integration and efficiency during the period of 1994-2002 for a panel of 49 countries. Similar to Zhang and Naceur (2019), they conclude that the main channel of transmission for the impact on FD on inequality is via the banking sector. Also, Law et al. (2014) suggest that when the quality of economic institutions is poor FD will have low impact on improving income inequality due to poor judiciary systems unable to protect the poor at the expense of the economic and political elites.

So far, the combination of the existing empirical and theoretical literature groups into 4 main hypotheses:

- First the hypothesis that FD widens inequality by benefiting the rich at the expense of the poor (Jauch & Watzka, 2016; Rajan & Zingales, 2003; Seven & Coskun, 2016).
- Second hypothesis is that FD narrows the income inequality gap by providing the poor with easier access to finance thus improving investment opportunities (Banerjee &Newman, 1993; Beck et al., 2007; Johansson & Wang, 2014; Ravallion, 2001).

- Third, there is the financial Kuznets curve hypothesis which suggest an inverted U-shaped relationship mirroring the different effects of FD on income inequality depending on the stages of development overtime (Greenwood & Jovanovic, 1990; Kim & Lin, 2011; Shahbaz et al., 2015).
- Lastly, the U-shaped hypothesis argues that at the beginning stage of growth, income inequality can be reduced by through financial deepening but after a certain level of financial growth the inequality gap is believed to widen (Tan & Law, 2012). By studying 35 developing countries, Tan and Law (2012) submitted that in the early stages of FD, inequality can be reduced then increased after a threshold in the presence of sound financial institutions, this view is later emphasized by Law et al. (2014).

2.3 The Relationship between Government Expenditure and Income Inequality

Existing literature linking government spending and income distribution has been frequently covered. It is self-evident that government spending has a direct impact on income distribution via transfer mechanisms (Coady & Gupta, 2012). In the early 1990s, government spending on redistributive transfers such as education for both developing and developed countries had shown to decrease inequality by one third (Coady & Gupta, 2012). This trend was even more pronounced when combined with progressive tax systems. However, not all empirical works agree to this stylized fact.

The main theoretical arguments underlying the link between redistribution and inequality are derived from the seminal works of Meltzer and Richard (1981) and more recently the work of Benabou (2000). In unequal societies, Meltzer and Richard (1981) argued that there is more unequal gap between mean voters as compared to median

voters. There for the median voter accrues more benefit from government transfers in comparison to the taxes needed to finance redistribution as such is expected to exercise more political pressure for redistributive governments. This hypothesis is however only true for political processes that follow majority voting and progressive taxation. Then there is Benabou's (2000) work which asserts that less redistributive spending is correlated with higher levels of income inequality. His work showed a nonlinear relationship between income inequality which occur in two stable redistributive states; one state of high inequality correlated with low redistributive spending and a low state correlated with high transfer, then an unstable state.

The empirical studies so far have mostly focused on sign of the association between the role of income inequality and the redistributive government spending. The evidence is inconclusive. One of the earliest works was done by Meltzer and Richard (1983) who like a few other studies (Easterly & Rebelo, 1993; Milanovic, 2000) found a positive association between income inequality and general government expenditures. On the other hand, Lindert (1996) and Perotti (1992) examined the transfers and spending variables for 14 OECD and 52 countries respectively and found a negative association though, insignificant overall. Other studies like that found this variable insignificant for both panel and time series data sets (Perotti,1996; Tullock, 1983).

Generally, a sudden shock in Government spending is very likely to either narrow or widen the income gap (Chu et al., 2000). For developing economies especially, the redistributive impact of government transfers combined with fiscal tools is not just dependent upon the magnitude of spending and taxes, but also in the composition of

these fiscal tools (for example, the ratio of direct to indirect taxes or of education to military expenditures) (Corneo & Schröder, 2018; König & Schröder, 2018).

2.4 The Relationship between Inflation and Income Inequality

Most studies investigating the impact of inflation on income inequality follow the work of Bulíř (2001) who categorized the redistributive impacts of inflation according to the ownership of wealth that is immune to inflation. Like other factors previously discussed, the literature shows inconsistency in findings. For instance, using a cross country regression, Romer and Romer (1998) found that 1 % increase in inflation increases the Gini coefficients by 0.2 points. Easterly and Fisher (2001), report that high inflation had the tendency to lower the real minimum wage thereby broadening the inequality gap. Similar works include that of Albanesi (2007) which provides evidence of the association of income inequality with price inflation. They also argue that the poor will more likely find inflation as a concern compared to the rich.

In contrast, other empirical studies argue that inflation reduces income inequality (Maestri & Roventini, 2012; Heer & Maussner, 2005). Galli and Hoeven (2001) reconcile the mixture in these findings by arguing for a non-nonlinear association between inflation and income inequality. They argue that for lower levels of initial increasing inflation is associated with falling inequality, meanwhile for higher initial levels the reverse will hold true. For instance, Monnin (2014) observed high inequality at low levels of inflation which later decreased to a minimal amount at an approximate rate of 13%, and then later increased at level beyond the aforementioned rate. Worthy of note is the common observation that variable and extreme levels of inflation would result in more income inequality.

Piketty and Saez (2014) infer from the historical observation of increase inequality prompted by the high inflation preceding the 1929 and 2008 great financial crashes as an issue of no coincidence. Taking the previously mentioned arguments into account, it shows that inflationary booms can assume partial blame on the deteriorating distribution of income for the last decades.

2.5 The Relationship Between Globalization and Income Inequality

Ongoing debates still resides as to how globalization affects income inequality. So far, globalization is known to be the cause of falling inequality across country boundaries but increases inequality within the countries (Ravallion, 2018; Beck et al., 2007). Massey and Fischer (2003) and Stiglitz (1998) among many others posit that globalization will expose some geographic regions and groups to marginalization due to the increase differences in returns to skills and education. This view holds true for most transitional economies experiencing higher levels of inequality after newly removing trade boundaries with the outside world (Mazur, 2000). This is also true for developed countries which adopt international specialization and outsourcing (Atkinson, 2001).

Meanwhile, some studies found that globalization could be beneficial in reducing inequality (Srinvasan & Nhagwati, 1999; Lewis, 1977). Wade (2011) argues that this occurrence is also true for countries that have just experience liberalization in terms of cross border trade interactions. Still in the same line of thought, Mills (2008) argues that through globalization the process of financial liberalization and integration had a positive impact on reducing the income distribution gap. Meanwhile, Krugman and Venables (1995) advocates for a nonlinear relationship, Lindert and Williamson (2001) find no significant relationship between globalization and income inequality.

More recently, the income inequality and globalization nexus has been revisited by a handful of researchers (Ravallion, 2018; Dorn & Schinke 2018; Gozgor & Ranjan 2017; Asteriou et al., 2014; Jaumotte et al., 2013; Dreher & Gaston, 2008). Generally, these studies report varying conclusions depending on the proxy for globalization and income inequality datasets examined, and method of estimation used. Most studies however refer to the use of Gini coefficients for measuring income inequality whereas, the measure of globalization is very often varied. Some studies simply rely on correlation whereas others make use of regressions with different control variables and specifications. Generally, most empirical studies found a positive interaction between globalization and income inequality (Ravallion, 2018; Gozgor & Ranjan 2017; Jaumotte et al., 2013)

2.6 Income Inequality in South Africa

The literature on income inequality in South Africa is well established and has often been decomposed by source of income, race and space (Leibbrandt et al., 2012). A number of studies have confirmed that income inequality still persists in South Africa (May & Govender, 1998). Part of this phenomenon is attributed to existing racial conflicts and social stratification (Mabugu et al., 2014). Hundenborn et al. (2016) argue that decomposing the source of income will enable south Africans to pinpoint and address income inequalities arising from different sources. Their study adopts Lerman and Yitzhaki (1985) decomposition method and observe that individuals with household income sources reported higher decrease in inequality contrast to those with conventional sources of income such as in the labor market.

A few studies have addressed the long run implication of inequality for economic wellbeing in South Africa. Leibbrandt et al. (2012) provide a long rang data set

classified by race starting from the 1917 to 2001. It was observed from this data that the Africans persisted in poverty over time and faced more gaps. Also, Whiteford and Van Seventer (2000) highlighted that the Gini coefficients of South Africa has remained among the highest in the world next to Brazil over the period of 1996 to 2001. Still, Gini coefficients are shown to widen for each racial group with the whites been at the bottom of the ladder contrast to Africans who remained at top. Still, till date South Africa remains one of the most unequally distributed society in terms of income and a subject of interest in this regard given its fairly advance financial system.

Finally, the study considers economic growth, FD, government expenditure, inflation and globalization to significantly affect the distribution of income in SA. This study hypothesizes for a nonlinear relationship in the inequality-finance nexus to best describe the nature of the interactions between these variables. In the upcoming section, the data, model specification and econometric methodology used are extensively discussed.

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Chapter 3

DATA AND METHODOLOGY

3.1 Data and Sample Selection

This thesis used annual time series data on income inequality (Gini coefficient), FD, economic growth, inflation, government consumption and economic globalization. The data on these variables over the period 1975-2018 were analyzed using time series techniques to find out the effect of FD on income inequality in SA. The variables were chosen on the basis of previous studies while the choice of the period is on the basis of data availability. In addition, there are significant changes in the global economy over the period which are worth evaluating in this research. The data on the macroeconomic variables (Gini coefficient, economic growth (GDP), government final consumption expenditure, Inflation (consumer price index), domestic credit) were gotten from the World Bank Development Indicators (WDI) while economic globalization index is obtained from KOF Index of Globalization. The endogenous variable is Gini coefficient used in representing income inequality while other variables serve as the independent variables.

3.2 Model Specification

The empirical model is specified based on the variables to achieve the research objectives. The model specification follows previous studies such as the work of Shahbaz (2010) and Yang and Greaney (2017). Thus, the model is specified as follows:

$$GINI_t = \beta_0 + \beta_1 GDP_t + \beta_2 FD_t + \beta_3 FD_t^2 + \beta_{4_t} GOV_t + \beta_5 CPI_t + \beta_6 GLOB_t + \varepsilon_t \quad (1)$$

Where; GINI= Gini coefficient (income inequality, GDP= economic growth, CPI= Consumer price index (Inflation), FD= Financial development, FD^2 = square of FD, GOV= Government Consumption Expenditure and GLOB= Economic globalization index. β_0 is the constant parameter while $\beta_1, \beta_2, \ldots . \beta_5$ are the coefficients of each variable respectively and the stochastic error term is represented by ε_t. The natural log of the variables is taken to harmonize the units of measurement, de-trend the series and control for the effect of outliers in the data. Hence the model becomes;

$$LnGINI_t = \beta_0 + \beta_1 LnGDP_t + \beta_2 LnFD_t + \beta_3 Ln(FD)_t^2 + \beta_{4_t} LnGOV_t + \beta_5 LnCPI_t + \beta_6 LnGLOB_t + \varepsilon_t \quad (2)$$

Where Ln = Natural log. This model is estimated with FMOLS to test the Kuznets curve hypothesis for FD.

3.3 Definition of Variables

The variables used in this thesis are defined in the table below.

Name	Indicator name	Measure	Source
GINI	GINI index	Gini coefficient measured by the deviation of income distribution from perfect equality.	World Bank WDI
FD	Domestic credit as a percentage of GDP	Gross financial sector credit provided to domestic investors	World Bank WDI
INF	Consumer Price Index	Inflation as measured by the consumer price index	World Bank WDI
RGDP	GDP (constant 2010 US$)	GDP at purchaser's prices in constant 2010 U.S. dollars.	World Bank WDI
GOV	Government consumption expenditure	General government final consumption expenditure (constant 2010 US$)	World Bank WDI
GLOB	Economic Globalization	Index of Economic Globalization.	KOF index of Globalization

WDI= World development indicators

3.4 Methods of Data Analysis

The thesis employed time series econometric techniques which include Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) unit root tests, Johansen cointegration test, Granger causality and fully modified OLS (FMOLS) regression techniques. These techniques are briefly discussed as follows;

3.4.1 Unit Root Tests (PP and ADF Tests)

Testing for unit root has become an integral part of time series analysis because it is established that most macroeconomic time series trended and nonstationary (Nelson & Plosser, 1982). Stationarity of time series implies that the series has constant mean and variance over time, that is, mean-reverting. This means, the series returns to its

long run mean after a shock and the effect of the shock is temporary. Nonstationary time series, on the other hand, denotes series whose mean and the variance changes over time and effect of shock on the series is permanent. Granger (1988) argued that regressing nonstationary variables on each other will result to spurious (nonsensical) estimates. It is therefore, necessary to evaluate the stationarity properties of the variables before the estimation of regression models. In this research, Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) unit root tests are used for the test of the stationarity of all the variables.

3.4.2 Augmented Dickey-Fuller (ADF) Test

The ADF unit root test is one of the most popular stationarity tests. It was proposed by Dickey and Fuller (1981) to examine the stationary properties of time series variables. The general equation of the test is specified in the form of Autoregressive process as follows;

$$\Delta y_t = \alpha + \delta T + \rho y_{t-1} + \sum_{i=1}^{p} \gamma_i y_{t-i} + \varepsilon_t \quad (3)$$

Here, y_t represents Gini coefficient, GDP, government final consumption expenditure, Inflation (consumer price index), FD and economic globalization index. The ADF test improves the Dickey-Fuller test by accounting for serial correlation via inclusion of the lags differences of the dependent variable (y_{t-1}). T represents time trend, α is constant, $i = 1, \ldots . p$ implies the number of lags, Δ denotes difference operator and ε_t is the random disturbance term which is normally distributed with zero mean and constant variance. The null hypothesis of the test is that y_t has unit root (not stationary, H_0:$\rho = 0$). The alternative hypothesis is that y_t does not have unit root (stationary, H_0:$\rho \neq 0$). When the ADF-statistic is more negative than the critical value at a chosen level of significance, say 5%, the null hypothesis is rejected and the series is stationary.

Otherwise, the series is considered to be nonstationary if the test failed to reject the null hypothesis.

3.4.3 Phillips Perron (PP) Test

Another commonly used unit root test in time series analysis is the Phillips-Perron (PP) unit root test developed by Phillips and Perron (1988). The test accounts for serial correlation and heteroscedasticity in the error term using the model specified as;

$$\Delta y_t = \boldsymbol{\beta}' \boldsymbol{D_t} + \pi y_{t-1} + \mu_t \quad (4)$$

μ_t is independently and identically distributed random error term with zero mean and constant variance, iid$\sim(0, \delta^2)$ and may be heteroscedastic. The PP test corrects for the serial correlation and heteroscedasticity in the error term by modifying the test statistics, $t_{\pi=0}$ and $T\hat{\pi}$. The modified statistics denoted by Z_t and Z_π are given by the following formulas.

$$Z_t = \left(\frac{\hat{\sigma}^2}{\hat{\lambda}^2}\right)^{\frac{1}{2}} . t_{\pi=0} - \frac{1}{2}\left(\frac{\hat{\lambda}^2 - \hat{\sigma}^2}{\hat{\lambda}^2}\right).\left(\frac{T.SE(\hat{\pi})}{\hat{\sigma}^2}\right) \quad (5)$$

$$Z_\pi = T\hat{\pi} - \frac{1}{2}\left(\frac{T.SE(\hat{\pi})}{\hat{\sigma}^2}\right)\left(\hat{\lambda}^2 - \hat{\sigma}^2\right) \quad (6)$$

The variance parameters, $\hat{\lambda}^2$ and $\hat{\sigma}^2$, are estimated using the following formulas

$$\hat{\sigma}^2 = \lim_{T\to\infty} T^{-1} \sum_{t=1}^{T} E\left[\mu_t^2\right] \quad (7)$$

$$\hat{\lambda}^2 = \lim_{T\to\infty} \sum_{t=1}^{T} E\left[T^{-1} s_T^2\right] \quad (8)$$

The sample variance of the error term is $S_T = \sum_{t=1}^{T} \mu_t . \mu_t$, and its Newey-West long-run variance are consistent with the estimate of $\hat{\sigma}^2$ and $\hat{\lambda}^2$ respectively. The null hypothesis is $\hat{\pi} = 0$ and the Z_t and Z_π statistics have same large sample (asymptotic) distribution as the ADF statistic. However, the PP tests controls for general form of heteroscedasticity and solve the issues associated with lag length selection.

3.4.4 Johansen Cointegration Test

This thesis employed the Johansen cointegration test. It is used to examine the existence of long-run relationship among the variables in the model. It follows the procedure of compact maximum likelihood test used for the examination of long-run relationship in a system of equation. In a multivariate model, like in this research, there may be multiple cointegrating vectors and the Johansen cointegration test is the appropriate test (Johansen & Juselius, 1990; Juselius, 2006; Kasa, 1992). The test has two statistics, trace ($\lambda_{trace}\,(r)$) and maximum Eigenvalue ($\lambda_{\max}(r, r+1)$) statistics which are estimated using the formulas bellow respectively.

$$\lambda_{trace}\,(r) = -T \sum_{i=r+1}^{n} \ln\left(1 - \hat{\lambda}_i\right) \tag{9}$$

$$\lambda_{\max}\quad (r, r+1) = -T \ln\left(1 - \hat{\lambda}_{r+1}\right) \tag{10}$$

Where r, T, and $\hat{\lambda}_i$ are the number of cointegrating vectors, the sample size and the i^{th} largest canonical correlation respectively. The null hypothesis of the trace statistics is r cointegrating vectors tested against the alternative hypothesis of n number of cointegrating vectors. The null hypothesis of the maximum eigenvalue test is r cointegrating vectors against the alternative of r+1 cointegrating vectors. The test is conducted in sequence of the null hypothesis. The null hypothesis is rejected if the test statistic is greater than the critical value of the Johansen's tables.

3.4.5 Granger Causality

To test causality between income inequality and all other variables, the Granger causality approach proposed by Granger (1969) was used. It tests for the examination of causal relationship between a pair of variables. The equation of the test in the form of the simple Vector Autoregressive (VAR) model shown as follows;

$$Y_t = \sum_{i=1}^{n} \alpha_i X_{t-i} + \sum_{j=1}^{n} \beta_i Y_{t-j} + \mu_{1t} \quad (11)$$

$$X_t = \sum_{i=1}^{m} \lambda_i Y_{t-i} + \sum_{j=1}^{m} \delta_i X_{t-j} + \mu_{2t} \quad (12)$$

The variables for which the causality is tested are Y_t and X_t while μ_{1t} and μ_{2t} are uncorrelated error terms. Granger causality means lagged Y significantly influences X and/or lagged X significantly influences Y. that is, the estimated lagged coefficients $\sum_{i=1}^{n} \alpha_i$ and $\sum_{i=1}^{m} \lambda_i$ statistically significant (different from zero).

Hence, empirically, the VECM in matrix form is specified as follows

$$\begin{pmatrix} \Delta GINI \\ \Delta GDP \\ \Delta FD \\ \Delta GOV \\ \Delta INF \\ \Delta GLOB \end{pmatrix}_t = \begin{pmatrix} \boldsymbol{v_1} \\ \boldsymbol{v_2} \\ \boldsymbol{v_3} \\ \boldsymbol{v_4} \\ \boldsymbol{v_5} \\ \boldsymbol{v_6} \end{pmatrix} + (\boldsymbol{L}) \begin{pmatrix} \varphi_{11}\varphi_{11}\varphi_{11}\varphi_{11}\varphi_{11}\varphi_{11}\varphi_{17} \\ \varphi_{21}\varphi_{22}\varphi_{23}\varphi_{24}\varphi_{25}\varphi_{26}\varphi_{27} \\ \varphi_{31}\varphi_{32}\varphi_{33}\varphi_{34}\varphi_{35}\varphi_{36}\varphi_{37} \\ \varphi_{41}\varphi_{42}\varphi_{43}\varphi_{44}\varphi_{45}\varphi_{46}\varphi_{47} \\ \varphi_{51}\varphi_{52}\varphi_{53}\varphi_{54}\varphi_{55}\varphi_{56}\varphi_{57} \\ \varphi_{61}\varphi_{62}\varphi_{63}\varphi_{64}\varphi_{65}\varphi_{66}\varphi_{67} \end{pmatrix} \begin{pmatrix} \Delta GINI \\ \Delta GDP \\ \Delta FD \\ \Delta GOV \\ \Delta INF \\ \Delta GLOB \end{pmatrix}_t$$

$$+ \boldsymbol{\Pi} \begin{pmatrix} \Delta GINI \\ \Delta GDP \\ \Delta FD \\ \Delta GOV \\ \Delta INF \\ \Delta GLOB \end{pmatrix}_{t-1} + \begin{pmatrix} \boldsymbol{e_1} \\ \boldsymbol{e_2} \\ \boldsymbol{e_3} \\ \boldsymbol{e_4} \\ \boldsymbol{e_5} \\ \boldsymbol{e_6} \end{pmatrix}_t$$

$\boldsymbol{\Pi} = \sum_{\boldsymbol{j=1}}^{\boldsymbol{j=p}} \varphi_j - \boldsymbol{I_k}$ **L** = the operator of lags.

The null hypotheses are Y does not Granger causes X ($\sum_{i=1}^{m} \lambda_i = 0$), The null hypotheses are X does not Granger causes Y ($\sum_{i=1}^{m} \lambda_i = 0$). The test is conducted using F-statistic. The null hypothesis is rejected when the estimated F-statistic is greater than the critical value.

3.5 Estimation of Long-Run Coefficients (Fully modified OLS)

When there is cointegration, that is long-run relationship between the variables, the Ordinary least square estimates are biased and inconsistent. Thus, long run cointegrating regressions are most appropriate. Therefore, the fully modified OLS (FMOLS) proposed by Phillips and Hansen (1990) is used for the estimation of equation (1) in this research. It eliminates the problem associated with cointegration through semi parametric method. The FMOLS estimator employs preliminary estimates of the symmetric and one-sided long-run covariance matrices of the residuals.

The FMOLS estimator is estimated using the formula below

$$\hat{\theta}_{fmols} = \begin{bmatrix} \hat{\beta} \\ \hat{\gamma}_1 \end{bmatrix} = \left(\sum_{t=2}^{T} Z_t^* Z_t^{*\prime} \right)^{-1} \sum_{t=2}^{T} Z_t^* y_t^+ - T \begin{bmatrix} \lambda_{12}^{+\prime} \\ 0 \end{bmatrix} \quad (13)$$

Where the transformed data is represented b $Z_t^* = (X_t', D_t')$. The Z_t^* and $y_t^+ \; Z_t^*$. With cointegration, Fully Modified OLS (FMOLS) is unbiased, efficient and consistent. Therefore, it outperforms the OLS. Thus, it is adopted here to evaluate the impact of FD on income inequality.

Chapter 4

EMPIRICAL RESULTS

4.1 Results of Unit Root Tests

Non-stationarity is a common feature of time series data. The problem associated with trended data is that OLS estimator produces bias and incorrect regression estimates which mislead the researcher to incorrect conclusions. In other words, the application of OLS on non-stationary series leads to spurious regression results. It is vital therefore, to perform unit root test to examine the order of integration of the series and avoid spurious regression.

To prevent the problem ADF and PP unit root tests were conducted in this thesis and the results are presented in table 4.1. Each of the tests is conducted using the models without constant and trend, with only constant as well as with trend and constant. Meanwhile, the PP shows that inflation (LINF) is stationary at level [I (0)] when the model with constant and trend is used. Similarly, the ADF indicates that LGINI and LINF are I (0). However, these results are not robust to the models with constant only and without constant and trend. At first difference, both the ADF and PP statistics show that all the variables are statistically significant at 1% in all the models. Therefore, both tests show that LGINI, LDCF, LDCF2, LGLOB, LGDPCO, LGOV and LINF are integrated of order one, I (1), in all models. This means, at level, the variables are non-stationary but become stationary when differenced once. Hence, the

variables are non-mean-reverting. Empirically, this means the effect of shock on the variables is permanent.

Augmented Dickey-Fuller and the Philips-Perron unit root tests were used to test the order of integration (stationarity) of the variables in the model.

Table 4.1: Result of Augmented Dickey-Fuller and the Philips-Perron unit root tests

At Level							
	LGINI	LDCF	LDCF2	LGLOB	LGDPCO	LGOV	LINF
τ_μ (PP)	-0.2780	-0.6533	-0.6363	-0.5937	-0.1277	-2.0354	-2.8626
τ_T (PP)	-2.3826	-2.1587	-2.2533	-2.0187	-0.9540	-1.8648	-4.4222***
τ (PP)	2.5329	1.8994	1.8461	0.7301	0.9133	1.9408	-0.6748
At First Difference							
	d(LGINI)	d(LDCF)	d(LDCF2)	d(LGLOB)	d(LGDPCO)	d(LGOV)	d(LINF)
τ_μ (PP)	-4.4819***	-7.3693***	-7.5296***	-4.5176***	-3.7668***	-7.0001***	-6.1225***
τ_T (PP)	-4.4211***	-7.2661***	-7.4209***	-4.5429***	-3.9749***	-7.0758***	-5.5947***
τ (PP)	-3.6749***	-6.8191***	-6.9609***	-4.4316***	-3.7737***	-6.5976***	-5.8136***
Augmented Dickey-Fuller (ADF)							
At Level							
	LGINI	LDCF	LDCF2	LGLOB	LGDPCO	LGOV	LINF
τ_μ (ADF)	-0.5735	-0.7087	-0.7072	-0.3331	-0.5447	-2.0354	-2.8575
τ_T (ADF)	-4.3901***	-2.2369	-2.3428	-2.2635	-1.3218	-1.9818	- 4.4266***
τ (ADF)	3.9074	1.6443	1.5436	0.9130	0.7563	1.6638	-0.6272
At First Difference							
	d(LGINI)	d(LDCF)	d(LDCF2)	d(LGLOB)	d(LGDPCO)	d(LGOV)	d(LINF)
τ_μ (ADF)	-4.7391***	-7.3884***	-7.5362***	-4.4947***	-3.7942***	-7.0040***	-4.7949***
τ_T (ADF)	-4.5086***	-7.2830***	-7.4267***	-4.5135***	-4.0387***	-7.0758***	-4.6228***
τ (ADF)	-1.4750***	-6.8424***	-6.9907***	-4.4778***	-3.7375***	-6.6113***	-4.8991***

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. τ_μ, τ_T and τ denote models with constant only, constant & trend and without trend and constant respectively. The natural logarithms of all the variables are used.

4.2 Result of Cointegration Tests

Johansen co-integration test was employed to examine the long-run equilibrium relationship among the variables.

Table 4.2: Result of Johansen cointegration tests

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.774004	156.5946	131.70	143.09
At most 1 *	0.710924	103.0539	102.14	111.01
At most 2	0.477395	58.37559	76.07	84.45
At most 3	0.377058	35.01413	53.12	60.16
At most 4	0.237333	17.97528	34.91	41.07
At most 5	0.185543	8.221655	19.96	24.60
At most 6	0.022880	0.833238	9.24	12.97

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.774004	53.54063	46.45	51.91
At most 1 *	0.710924	44.67834	40.30	46.82
At most 2	0.477395	23.36146	34.40	39.79
At most 3	0.377058	17.03885	28.14	33.24
At most 4	0.237333	9.753622	22.00	26.81
At most 5	0.185543	7.388417	15.67	20.20
At most 6	0.022880	0.833238	9.24	12.97

*(**) denotes 5%(1%) level of significance

The unit root results indicate that all the variables are generally I(1). So, there could be cointegrating relationship among the variables. In order to test for the existence of the cointegration, the Johansen cointegration test was employed and the result is presented in table 4.2. The upper and the lower portions of the table contains the results of the Trace and Maximum-Eigen statistics respectively. At 5%, first and second null hypotheses were rejected by both the Trace and Maximum Eigen statistics which are greater than the 5% critical values. At 1%, only the first hypothesis is rejected by both test. Therefore, both statistics indicate 2 cointegrating equations at 5% level and 1 cointegrating equation at the 1% level of significance respectively. This shows that

there is cointegration among the variables. This connotes an existing long-run equilibrium association among the variables.

4.3 Result of Fully Modified Least Squares (FMOLS)

Fully modified least squares was employed to measure the long run coefficients of variables.

Table 4.3: Result of Fully Modified Least Squares (FMOLS)

Dependent Variable: LGINI				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDCF	-0.154727	0.025500	-6.067780	0.0000
LDCF2	0.017306	0.002633	6.573524	0.0000
LGLOB	0.018720	0.000889	21.05922	0.0000
LGDPCO	-0.042810	0.002208	-19.39167	0.0000
LGOV	-0.007944	0.002079	-3.821199	0.0006
LINF	0.010076	0.000377	26.75242	0.0000
Constant	4.711737	0.075142	62.70447	0.0000
@TREND	0.000764	4.81E-05	15.89093	0.0000
R-squared	0.853744	Mean dependent var		4.079676
Adjusted R-squared	0.819617	S.D. dependent var		0.009528
S.E. of regression	0.004047	Sum squared resid		0.000491
Long-run variance	2.05E-07			

LGINI= Gini coefficient, LDCF= FD, LDCF2= LDCF square, LGLOB = economic globalization, LGDPCO=GDP, LGOV= Government consumption, LINF=Consumer Price Index (Inflation). All the variables are log transformed to harmonize the unit of measurement.

Given the result of the cointegration test which shows that there is cointegration, the most appropriate estimation technique adopted in this thesis is the Fully modified OLS (FMOLS). This is because the Fully Modified OLS (FMOLS) takes care of the effect of cointegration in its estimations. Since cointegration exists between the variables in the model, the fully modified OLS is used for the evaluation of the financial Kuznets Hypothesis. Table 4.3 shows the results.

The result of the regression contains numerous statistics. Out of these, the mainly interested in the sign, size, and significance of coefficient (3S). The sign of the coefficient indicates the nature of relationship between the independent and dependent variables while the size reveals the extent of influence of the independent variables on the dependent variables. Likewise, the significance shows the importance of the independent variables as determinants of the dependent variable. So, the data analysis delves majorly on the sign, size and significance of the coefficients. Equally considered important is the R-square statistic for the test of the fitness of the models.

The GINI coefficient is the endogenous while the independent variables are LDCF, LDCF2, LGLOB, LGDPCO, LGOV and LINF. The result shows that the coefficient of FD, is negative while its square is positive. This indicates that FD is negatively related to GINI coefficient while the square of FD is positively related to GINI coefficient. This indicates the existence of U-shaped association between FD and income inequality. Meaning, an increase in FD leads to a decrease in income inequality to a certain minimum point (turning point) after which further improvement in the FD will bring about increase in income inequality. The result further shows that GDP and government consumption are negatively related to income inequality while globalization and inflation are positively related to GINI coefficient (income inequality). The negative relationship with FD implies that at income inequality reduces with increase in FD. Similarly, increase in government consumption and economic growth lead to reduction in income inequality in South Africa.

Conversely, increase in globalization and inflation increases income inequality in SA. Furthermore, the coefficient estimates are statistically significant at 1% level of significance. The statistical significance is shown by the P-values of all the coefficient

which are less than 1%. This implies that FD, economic growth, government consumption, globalization and inflation are significant determinants of income inequality in South Africa.

The magnitude of the coefficients shows that 1% rise in FD, will lead to 0.154727% fall in income inequality while 1% increase in the square of FD measure leads to about 0.017306% increase in income inequality. Thus, the turning point – [-0.154727/ 2(0.017306)] is 4.47. This suggests that increase in FD will reduce income inequality until it is 4.47% after which further increase in FD will lead to increase in income inequality. In order words, the improvement of the financial sector will enhance the reduction of income inequality at early stage. After a significant reduction in the income inequality, further financial sector reforms and development will result to rise in the income inequality. This is in line with the findings of Beck et al. (2000), Laeven et al. (2015), Bairadi and Morana (2016) as well as Jung and Vijverberg (2019). Regarding, the coefficients of other variables, the result indicates that increase in a percentage increase in economic globalization and inflation brings about 0.018720 and 0.010076 increase in income inequality respectively. Conversely, 1% increase in economic growth and government consumption result to about 0.042810 and 0.007944 percent reduction in income inequality in South Africa. Therefore, the result shows that FD, economic growth, government consumption, globalization and inflation have enormous and significant impact on income inequality in South Africa.

The R^2 statistics, 0.853744, shows that about 85.37% variation in income inequality in South Africa is explained by the changes in the independent variables used in this research. This means the model is a good fit. Thus, estimates are valid and consistent for policy inferences.

4.4 Result of Granger Causality

Granger causality test investigated the causality direction among the variables.

Table 4.4: Result of Granger Causality

Dependent variable: D(LGDPCO)		
Excluded	Chi-sq	Prob.
D(LGINI)	0.695971	0.7061
D(LDCF)	0.080968	0.9603
D(LDCF2)	0.106131	0.9483
D(LGLOB)	1.463433	0.4811
D(LGOV)	9.168744	0.0102
D(LINF)	2.475289	0.2901
All	19.01469	0.0882
Dependent variable: D(LINF)		
Excluded	Chi-sq	Prob.
D(LGINI)	14.45124	0.0007
D(LDCF)	9.044803	0.0109
D(LDCF2)	9.496914	0.0087
D(LGLOB)	2.305449	0.3158
D(LGDPCO)	1.573615	0.4553
D(LGOV)	4.770353	0.0921
All	24.46905	0.0175

To test the causality between the variables in the model, the VECM Granger causality test was conducted and the result is reported in table 4. 4. The result of only economic growth and inflation are however presented. This is because all other variables do not have causal relationship with GINI coefficient in the long run and thus expunged from the result. Meanwhile, result in the upper portion of table 4.4 indicates that, individually, causality exist only when government consumption was excluded with economic growth as dependent variable. However, jointly, Granger causality exists between the economic growth and other variables including GINI coefficient in the model. The lower portion of the table 3 reports the Granger causality result for inflation. It indicates the existence of causal relationship between GINI and inflation in the model. In short, there is causality between GINI coefficient, economic growth

and inflation in South Africa. This implies that past values of economic growth and inflation drives income inequality in South Africa.

Chapter 5

CONCLUSION

5.1 Summary and Discussion of Findings

This thesis evaluates the impact of FD on income inequality in South Africa. Adopting time series analysis of unit root test, cointegration tests, FMOLS and Granger causality test, the thesis focuses on the test of financial Kuznets Curve Hypothesis model. The findings of the empirical analysis show that, all the variables are generally integrated of order one and the existence of cointegration among the variables was also revealed. The result of the unit root test implies that the effect of shock on the variables is permanent. It indicates that when certain policy decisions are taken, the effect on inequality, financial development and all other variables considered will persist over time.

Moreover, the result of the cointegration test shows the presence of cointegration. This implies long-run relationship between income inequality, FD, economic growth, globalization, government consumption and inflation in South Africa. The findings also show that, GDP and government consumption are inversely associated to income inequality while globalization and inflation are positively related to income inequality in South Africa. Intuitively, increase in national income and redistribution of the income via increase in government spending results to reduction in income inequality in the country. The increase in the government spending improves the wellbeing of the generality of the populace and provides opportunity for all and sundry. Alternatively,

the increased government spending is often sponsored by taxes which enables redistribution of income in the economy. These findings conforms to the findings of Ravallion (2018), Gozgor and Ranjan (2017) and Jaumotte et al. (2013).

The result further reveals that FD and its square respectively have negative and positive relationship with income inequality in South Africa. This confirms the U-shape hypothesis. Meaning, increase in FD will results to decrease in income inequality to a certain minimum point (turning point) after which further improvement in the FD results to increase in income inequality. The turning point is found to be about 4.47%. In other words, the effect of FD on the income distribution depends on the stage of the development. Initially, financial development enhances financial services and create easy access to credit facilities. This provides opportunities for emerging entrepreneurs to expand budding small-scale business.

Generally, this improves the income of individuals and promote economic growth and development. However, the expansion of economic activities and growth of the economy beyond the turning point, creates excess demand for financial services in one hand and emergence of new bourgeoisies, and widens income inequality due to exploitative tendencies of the new capitalist created by the economic development that follows financial development. Therefore, FD is revealed to be a significant driver of income inequality in South Africa. This validates the findings of Beck et al. (2000), Laeven et al. (2015), Bairadi and Morana (2016) as well as Jung and Vijverberg (2019) who found the significance of inverted Kuznets curve for the relationship between FD and income inequality.

5.2 Conclusion

Having evaluated the effect of FD on income inequality in South Africa, this thesis affirms the significance of FD in determining the level of income inequality in the country. Controlling for other variables such as economic growth, globalization, government consumption and inflation, it is observed that the FD and income distribution nexus in South Africa is characterized inverted Kuznets Curve (U-shape relationship). Put differently, FD is a viable instrument for the reduction of income inequality in South Africa. But the effectiveness depends on the level of development and income inequality. The turning point indicates that at very low level of income inequality, further FD widens the income gap among the people in the country. This thesis therefore, concludes that FD is a significant determinant of income distribution and the impact depends on the stage of FD and income inequality in South Africa.

5.3 Recommendations

The issue of income inequality and the ways of ameliorating it occupies the attention of researchers and policymakers over time. Therefore, this thesis contributes to the analysis and provide few recommendations in accordance with the findings.

First, policymakers in South Africa and probably other emerging markets should prioritize the development of financial institutions and markets to reduce income inequality. A vibrant financial sector provides opportunities for all class of people and facilitate access to domestic credit for investment in the economy. This leads to the development of private sector and consequently bridge income gap between the upper- and lower-income class.

Second, economic policies that promotes production and economic growth should be entranced. There will be a reduction income gap due to the increase in growth in the economy. Also, with higher economic growth, government transfers and poverty alleviation policies can easily be implemented. These policies improve the well-being of the poor and thus lead to improvement in income distribution.

Third, the government of South Africa should use expansionary fiscal policies. Meanwhile, the policies should focus on increasing government expenditure which reduces inequality.

Fourth, the country should embrace economic liberalization with caution. Greater integration of the domestic economy to the global economy gives undue and greater opportunity to the upper income class than the middle- and low-income class. This widens the income gap and worsen income inequality. Moreover, removal of trade barriers exposes the transition economies to unhealthy competition which distributes return on skills unevenly. This widens income inequality in the domestic economy.

Lastly, effective control of inflation should be considered for the reduction of income inequality in the country. This can be achieved by inflation targeting. High inflation lowers real income and affects the low-income earners more than the high income earners. Thus, measures that lowers inflation rate improves real wages and ensure redistribution of income that reduces income inequality.

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