ANNALS OF ECONOMICS AND FINANCE **17-2**, 337–364 (2016)

Empirical Analysis of the Main Drivers of Income Inequality in Southern Africa

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Using the dynamic system GMM estimation procedure, this paper empirically analyzes the principal drivers of market income inequality in Southern Africa, which has the highest income inequality in Africa. Our novel finding shows strong support for a dynamic, non-monotonic, inverted U-shaped, effect of inequality in the model. We find evidence of existence of the Kuznets curve in the sub-region. A non-monotonic, inverted Kuznets-type effect is found for political globalization. Our results show that access to secondary education and natural resources dependence strongly and significantly equalize income. We find that population growth and domestic investment rate appear to be income disequalizing.

Key Words: Economic growth; Main drivers; Income inequality; Income redistribution; Southern Africa.

JEL Classification Numbers: D31, D63, I32, O40, O55.

1. INTRODUCTION

Southern Africa has not enjoyed high economic growth rates in the African continent over the past decade. Figure 1, for example, shows that the sub-region had the smallest average economic growth at 3.3 percent between 2010 and 2015 among Africa's regions. It is also less than the African average growth rate at 4.3 percent during the period. At the same time, the sub-region has the highest average income inequality at 61 among Africa's sub-regions (Figure 2). Its income inequality averaged 61 against the African average of about 50 between 1970 and 2011.

The combination of low economic growth and stubbornly high income inequality rates remains a serious concern. Indeed, income inequality has become a hot development issue across the globe (see, for example, Piketty, 2014).

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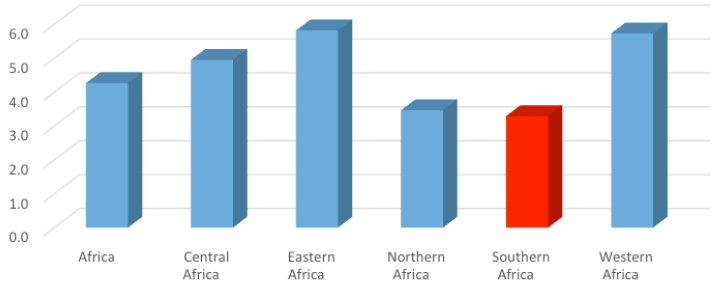
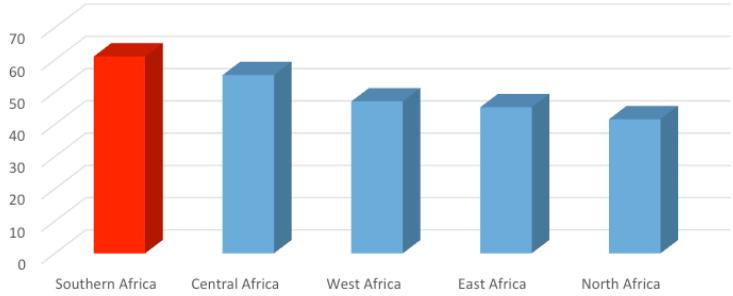
FIG. 1. Comparative Average Sub-Regional Real GDP Growth in Africa, 2010-2015



Source: Author, using African Development Bank Data.

FIG. 2. Average Income Inequality Among Africa's Regions, 1970-2011



Source: Author, using SWIIDv5/Solt (2014) Data.

Tackling the problem of income inequality is important because inequality will negatively affect progress toward the SDGs and poverty reduction generally, among other deleterious effects. The extent of inequality, its major drivers, and what to do about it, have become some of the most hotly debated issues by policymakers and researchers alike.

This paper extends and contributes to the literature on the drivers of income inequality in Southern Africa in five ways. Firstly, we show why income inequality matters and hence why policymakers need to put high and increased focus on it so as to bring it down sustainably. Secondly, unlike previous studies, the paper uses the most comprehensive data set on market and net income inequality covering 9 Southern African countries over three decades. Thirdly, using this data set, the paper shows some new, interesting stylized facts on income inequality in the sub-region. Fourthly, the paper empirically assesses the impact of key domestic and external drivers of income inequality with a view to drawing key lessons for the sub-region. Fifthly, we offer policy suggestions in light of the evidence that

would help Southern African countries to effectively tackle the problem of high and persistent income inequality in the sub-region.

The further contents of the paper is adumbrated as follows. Section II briefly discusses why income inequality matters while Section III presents some stylized facts on income inequality in Southern Africa. Section IV examines a brief literature review. Section V presents the model and the data while Section VI presents and discusses the empirical estimates. Section VII concludes the paper with policy implications.

2. WHY DOES INCOME INEQUALITY MATTER?

Income inequality has become a hot development issue across the globe. It is widely recognized that high and persistent income inequality is the defining challenge of our time, a transition between the end of the Millennium Development Goals' (MDGs') period and the beginning of the implementation of the Sustainable Development Goals (SDGs). Tackling the problem of income inequality is important because inequality negatively will affect progress toward the SDGs and poverty reduction generally; it results in inefficient resource allocation, wasted productive potential and impaired institutional development, among others.

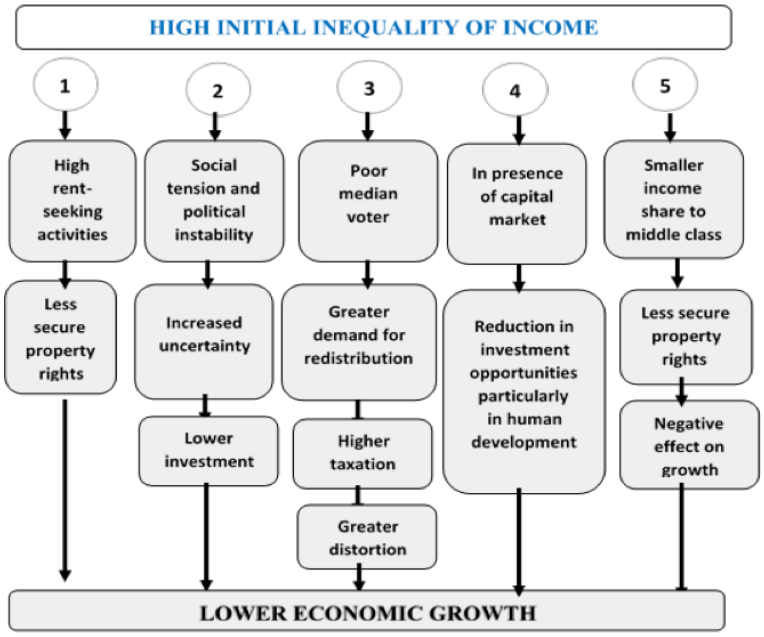
As Melamed (2011) has argued, high income inequality is morally unacceptable to many as high income inequality means that some individuals and groups (genders, geographies, religions and ages) are systematically deprived of their rights. High income inequality has negative effects on poverty reduction and on a country's growth and stability. It restricts growth (see, for example, Persson and Tabellini, 1991; Alesina and Rodrik, 1994; Okojie and Abebe, 2006; Ncube, Anyanwu and Hausken, 2014) and its sustainability (see Berg and Ostry, 2011; Ostry, Berg, and Tsangarides, 2014), hence the skills and talents of a significant part of the population are unused. Also, high income inequality is bad politics since a very unequal society is often a less stable society as it is unlikely to represent views, especially of the marginalized.

The IMF (2014) and Dabla-Norris et al (2015), concur by indicating that high income inequality can be a signal of lack of income mobility and opportunity, reflecting a persistent disadvantage for particular segments of the society while having significant implications for growth and macroeconomic stability. In addition, high income inequality leads to a suboptimal use of human resources, concentrating political and decision making power in the hands of a few, thus adversely affecting drivers of growth such as causing investment-reducing political and economic instability, raising crisis risk (see Rajan 2010), hampering poverty reduction (see, for example, Ncube, Anyanwu and Hausken, 2014; Anyanwu, 2014). It also hinders the achievement of macroeconomic stability and growth and is associated with

conflicts due to the damage to trust and social cohesion. In turn, this discourages investment (especially in human and physical development) and reduces economic growth (see Cojocaru and Diagne, 2014 for detailed review). It could also lead to policies that hurt growth and development generally in addition to adversely affecting people's happiness (Alesina, Di Tella and MacCulloch, 2004), lowering the levels of mobility between generations (Corak, 2013), and leading to substantially larger external deficits (Kumholf et al, 2012).

Putting all these together, Nissanke and Thorbecke (2006) provide a very good framework on the channels through which high income inequality affects the economy (Figure 3). The Figure shows that high initial inequality leads to rent-seeking, social tensions, political instability, a poor median voter, imperfect capital markets and a small share of gross national income (GNI) to the middle class, all of which lead to lower investment, higher taxation and lower economic growth (see UNDP, 2013; UN, 2013).

FIG. 3. Conceptual Linkages from Income Inequality-to-Economic Growth



Source: Nissanke and Thorbecje (2006)

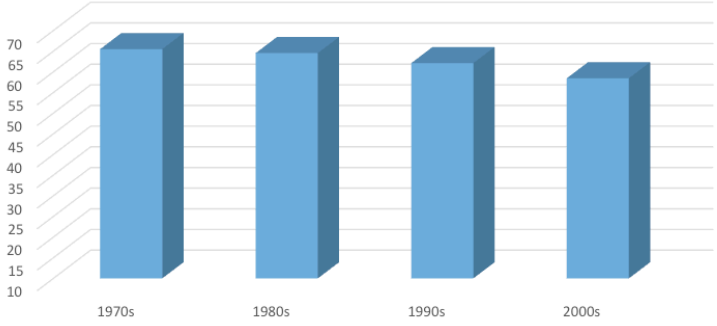
Thus, understanding the causes of income inequality in Southern African countries is fundamental to devising policy measures that can allow the prosperity of the countries to be shared more broadly than has been evident so far. Indeed, reducing inequality remains important not just from

the point of view of achieving a more egalitarian distribution of income and addressing the welfare and social concerns that widening disparities in income raise. Evidence has shown that nations that effectively address income inequality tend to experience more harmonious civil and political societies, with greater happiness, and typically have more sustainable growth and reduced crime as well as other forms of social upheavals. Income inequality increases social discontent and fuels social unrest as evidenced during the recent "Arab Spring". The consequent social unrest increases the probability of mass violence, revolutions, coups, policy uncertainty, and threat to property rights, thus reducing domestic and foreign investment and, consequently reducing economic growth.

3. STYLIZED FACTS ON INCOME INEQUALITY IN SOUTHERN AFRICA

The pattern of income inequality reveals that average income inequality in Southern Africa reached a peak in 1978 at 71.7. Average income inequality fluctuated and generally decreased somewhat thereafter until 2011 when it stood at 49.1. Indeed, the trend in average income inequality reflects the long-term stability of the income Gini coefficient in the sub-region. Figure 4 presents the trend of decadal averages of market income inequality in Southern Africa. The sub-regional averages are unweighted means of country averages during the decades of the 1970s to 2000s. It shows that income inequality had been high and persistent in the sub-region, in spite of some marginal overall decline over decades.

FIG. 4. Trend in Income Inequality in Southern Africa, 1970s-2000s



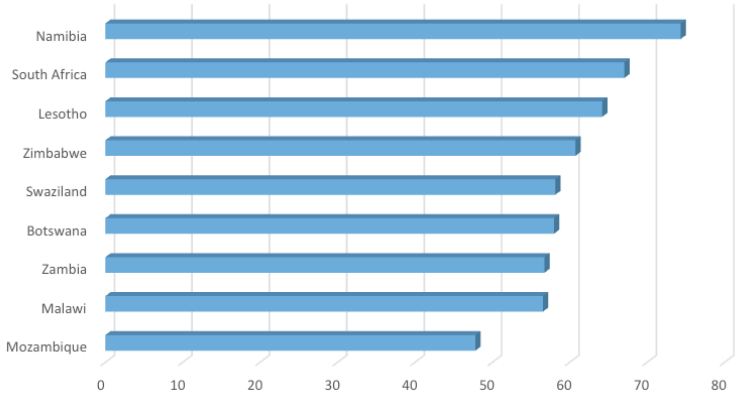
Source: Author, using SWIIDv5/Solt (2014).

Note: Note: The Gini coefficient is a measure of inequality that varies between 0 (complete equality) to 100 (all income goes to one individual).

However, these sub-regional averages mask country differences. For example, Namibia tops the list of unequal countries in Southern Africa (Figure 5). This is followed by South Africa, Lesotho, Zimbabwe, Swaziland, Botswana, Zambia, Malawi, and Mozambique, in that order. Another interesting feature is that no Southern African country had an average Gini coefficient below 45. It is noteworthy that most unequal countries in the world are in Southern Africa. They include Namibia, South Africa, Lesotho, and Zimbabwe, among others.

Figure 6 shows a scatterplot of Southern African countries on log of average real GDP per capita and average market income inequality. Countries that are in the southeast quadrant indicate those that they have experienced a low real per capita GDP and relatively very high levels of income inequality. They include Lesotho and Zimbabwe. Southern African countries in the northeast quadrant have had high real GDP per capita but relatively high income inequality, indicating the non-inclusive nature of the high level of economic development in those countries. This is particularly so for Namibia and South Africa. Countries in the north-west quadrant experienced high level of real per capita GDP but relatively low income inequality, demonstrating relatively more inclusive economic development. The countries in that group include Botswana and Swaziland.

FIG. 5. Southern Africa: Average Income Inequality By Country

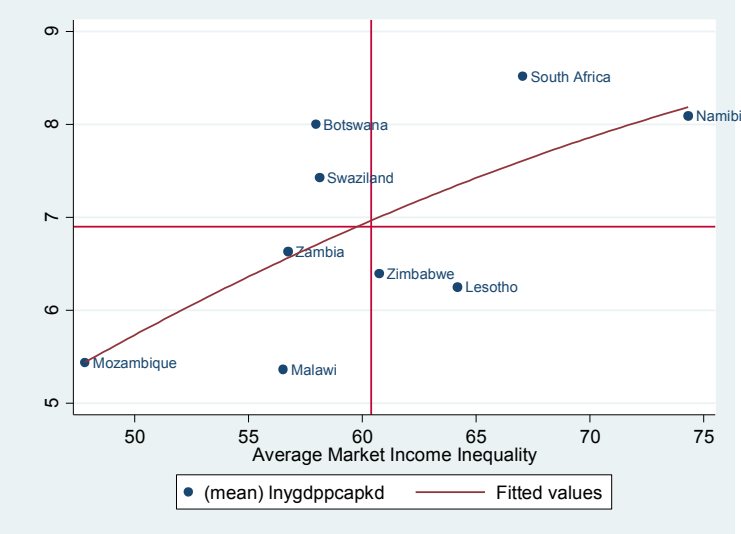


Source: Author, using data from SWIIDv5/Solt (2014).

Note: Note: The Gini coefficient is a measure of inequality that varies between 0 (complete equality) to 100 (all income goes to one individual).

In the south-west quadrant, we find countries that have relatively low-income inequality in spite of their low real per capita income. They include Mozambique, Malawi, and Zambia. Another interesting observation from

FIG. 6. Southern Africa: Average GDP Per Capita and Market Income Inequality



Source: Author, using estimation data.

Note: Note: The Gini coefficient is a measure of inequality that varies between 0 (complete equality) to 100 (all income goes to one individual).

Figure 6 is the relatively inverted U-shaped relationship between economic development and income inequality in Southern Africa.

4. REVIEW OF KEY DRIVERS OF INCOME INEQUALITY

We organize recent empirical literature on the factors that drive income inequality around key ones as shown below, though in many cases empirical results revolve around multiple factors.

Levels of Past Income Inequality

Income inequality is said to be characterized by a great degree of inertia, which does not allow for a rapid and dramatic change. It has been suggested therefore that levels of past income inequality are associated with current levels of income inequality. The empirical results of Li, Squire and Zou (1998), Dincer and Gunalp (2012), and Mahmood and Noor (2014), confirm this hypothesis.

The Level of Economic Development

Kuznets' (1955) seminal paper argues that as countries develop, income disparity first increases, peaks and then decreases. He argued that an ini-

tial increase in income is associated with increasing income inequality while with further increases in income, income inequality reaches a maximum and then starts declining. Therefore, it is hypothesized that GDP per capita will have a positive sign and the squared term of GDP per capita, a negative sign. The resulting Kuznets curve therefore argues that GDP per capita (income) and income inequality have an inverted U-shaped relationship. Some of the studies that confirm the Kuznets curve include Alderson and Nielsen (2002) for OECD countries, Dincer and Gunalp (2012) for the United States, and Seneviratne and Sun (2013) for ASEAN-5. However, Lee et al (2013) for Korea and Claus, Martinez-Vazquez and Vulovic (2012) for Asian countries, confirm Barro's (2000) hypothesis of a U-shaped relationship between per capita GDP and income inequality.

Population Growth and Age Dependency

The key demographic variables hypothesized to influence income inequality include population growth and age dependency or population structure. As Claus, Martinez-Vazquez and Vulovic (2012) have posited, an increase in population growth raises labour supply which lowers wages. In turn, the decline in wages is expected to increase income inequality. According to them, the demographic transition may affect inequality because it proxies for generalized sociocultural dualism, the general social heterogeneity resulting from the uneven diffusion of modern technology and culture in the course of development. According to the argument, any item or trait associated with development that has implications for income and that is distributed unevenly over the population will generate its own sectoral inequality. Campante and Do (2007) find significant negative effect of population growth, population size, and population density in a cross-section of developing and developed countries, while Claus, Martinez-Vazquez and Vulovic (2012) find significant negative effect of population growth for Asian countries. Alderson and Nielsen (2002) find significant positive effect for population growth.

Higher youth dependency, which is defined as the ratio of the number of persons ages 0-15 to the number of persons ages 16-64, is hypothesized to lead to greater income inequality, principally because higher youth dependency suggests a higher average number of children per household and lower household per capita income. In the same vein, old-age dependency, which is defined as the ratio of persons ages 65 or over to the number of persons ages 16-64, is expected to be associated with relatively lower income inequality, given the flatter income profile of this age group. However, these two age groups, especially in developing countries are dependent on the working population and therefore determine the dependency burden of a country. A higher dependency burden would translate into lower incomes per capita or higher income inequality hence the expected sign on each vari-

able is positive, all things being equal. Deaton and Paxson (1997) and Lee et al (2013) have shown that aging leads to an increase in income inequality. Claus, Martinez-Vazquez and Vulovic (2012) have empirically found negative significant effects for both youth dependency and old-age dependency for Asian countries. Dincer and Gunalp, (2012) found an inverted U-shaped relationship between age dependency and income inequality in the United States.

Education

It is generally believed that a higher level of education or skill premium, representing diffusion of education or "skills deepening", is expected to increase the income of households and individuals and hence should reduce income inequality. This is consistent with straightforward supply and demand reasoning under which an increase in the supply of skilled (or credentialed) workers will reduce the wage differential between the skilled and unskilled (Lecaillon et al., 1984). However, Crenshaw and Ameen (1994) have argued that the relationship is reversed and becomes positive at high levels of educational expansion, reflecting the emergence of a new post-industrial regime. In addition, as Knight and Sabot (1983) had stated, there are two distinct effects of education on income distribution: the "composition effect" and the "compression effect". The "composition effect" increases the relative size of the educated people and tends to raise income inequality first, but eventually lowers it. On the other hand, "compression effect", lowers income inequality as the return on education decreases as the relative supply of educated people increases. Thus, the effects of education on income inequality depend on the strength of these two effects (Dincer and Gunalp, 2012). The hypothesis of a significant negative effect of education on income inequality has been confirmed by Knight and Sabot (1983), Crenshaw and Ameen (1994), Barro (2000), Alderson and Nielsen (2002), and Anyanwu (2011), Claus, Martinez-Vazquez and Vulovic (2012), Dincer and Gunalp (2012), and Mahmood and Noor (2014). Dabla-Norris et al (2015) find that higher skill premium is associated with widening inequality in advanced economies.

Natural Resources

The resource curse argument indicates that natural resources dependence increases the possibility of rent capture and the creation of a rentier state which exacerbates the inequality not only because of the rent extraction by the ruling elite but also because of limited redistribution towards the lower socioeconomics segments of the population. Thus, it is postulated that natural resource abundance: (a) creates rents that are easily captured by the ruling elite hence exacerbating the income gap between the higher and the lower classes; (b) is associated with retardation of the emergence of

manufacturing and industrialization; and (c) impedes creation of effective and efficient institutions that would put more stringent constraints on the possibilities of rents expropriation. Empirical results from Buccellato and Alessandrini (2009) confirm positive natural resource rents effect on income inequality while Mallaye et al (2015) find negative effect of oil rent but this turns positive when interacted with corruption.

Domestic Capital Formation

The intuition on the relationship between domestic investment and income inequality is that domestic investment spending means more people getting jobs, which implies that more people are earning, thereby putting a downward pressure on income inequality. With respect to regional inequality in China, Zhang and Zhang (2003) find that unequal domestic investment spending across the regions is the largest factor behind increasing inequality in the regions. Székely and Sámano (2012) do not find a significant effect of the investment rate on income inequality in Latin America just as Seneviratne and Sun (2013) for ASEAN-5. Lee et al (2013) find negative significant effects for Korea as Chaudhry and Imran (2013) do for Pakistan.

The Size of Government/Government Consumption Expenditure

Government involvement in the economy (as well as a wider proxy of the effect of redistribution and government policy variable) can be captured by the size of the government. The size of government may matter for income inequality since larger governments may be more able to meet the demands of lower income households and individuals through different social programs, leading to better distributional outcomes (Claus, Martinez-Vazquez and Vulovic, 2012). The idea is that government spending tends to increase income of all sections of the society especially the poorer sections, therefore decreasing income inequality. Odedokun and Round (2004) and Anyanwu (2011) for African countries find no significant effect while Dabla-Norris et al (2015) find positive effect for OECD countries.

Globalization

Various indicators of globalization are hypothesized to affect income inequality differently. The IMF (2007) also finds that financial globalization, and especially FDI, is associated with higher inequality in developing countries. Recent results by Sturm and De Haan (2015) suggest that globalization is positively significant: financial globalization (FDI stock) drives this finding, as trade openness is not significant. Jaumote et al. (2013) find that trade globalization is associated with a reduction in income inequality, whereas financial globalization is associated with an increase in inequality.

Some recent studies have used KOF's overall globalization index — which takes into account actual economic flows (e.g., trade, foreign direct investment), economic restrictions (e.g., import barriers, tariff rates), information flows (e.g., internet users, trade in newspapers), personal contact (e.g., telephone traffic, international tourism), and cultural proximity (see Dreher et al, 2008) — to test the effect of globalization on income inequality. Using their KOF globalization index, Dreher and Gaston (2008) find that globalization has exacerbated inequality in OECD countries but without any robust impact on inequality in less developed nations. Also, results from Claus, Martinez-Vazquez and Vulovic (2012) show that globalization has significant positive effect on income inequality.

Atif et al (2012), using a panel of 68 countries over a period of 20 years, find positive relationship between globalization (KOF's overall globalization index) and income inequality, suggesting that an increase in globalization would lead to a worsening of income distribution. This finding is a direct contradiction of the result of Zhou et al (2011). It is interesting to observe that the coefficient of KOF Index, indicator for globalization, in the Atif et al (2012) study is not only positively related to Gini coefficient in all four models (pooled OLS, fixed, random, and dynamic), but also highly significant in each model. Elmawasini et al. (2013) use the 2010 KOF globalization index to measure the overall impact of globalization on income inequality in South Europe and CIS countries. Their findings support the hypothesis that globalization increases income inequalities within countries.

Receipt of International Remittances

Using a 2005/06 household survey to analyze the impact of internal remittances (from Ghana) and international remittances (from African and other countries) on poverty and inequality in Ghana, Adams (Jr), Cuecuecha, and Page (2008) find that both types of remittances increase income inequality in Ghana. In particular, for households with international remittances, the inclusion of remittances causes income inequality to increase by 17.4 percent. Also, Yang and Martinez (2006) examine the effects of remittances upon poverty and inequality indicators in the Philippines and find that the effect on the inequality indicator was not statistically significant.

Acosta et al (2008), based on a study of ten Latin American countries, find that international remittances have negative, albeit relatively small, inequality-reducing effects, even after imputations for the potential home earnings of migrants.

In another study, Wouterse (2009) use data from four villages in Burkina Faso to compare the marginal effects of remittances from intercontinental and intra-African migration on inequality, poverty, and social welfare and find that intra-African remittances reduce inequality while intercontinental

remittances have the opposite effect. In the same vein, Gubert, Lassourd and Mesplé-Somps (2010), using a 2006 household survey in Mali, show that remittances reduce income inequality. In another study, Giannetti, Federici, and Raitano (2009) find that, apart from Slovenia, where income inequality increased, the inclusion of income from remittances reduces income inequality. However, the magnitude of the reduction of income inequality is very small, possibly because of the low share of recipient households. At any rate also in Hungary (where the share is 12.8 percent) the income inequality decreasing effect of remittances is very low.

Anyanwu (2011) investigates the impact of migrant remittances on income inequality in African countries, using a panel of five eight-year non-overlapping windows for the period 1960-2006. The results suggest that, first, international migrant remittances have a significant positive impact on income inequality in African countries. After instrumenting for the possible endogeneity of remittances, a 10 percent increase in remittances as a percentage of GDP will lead, on average, to a 0.013 percent increase in income inequality in Africa. In addition, remittances inflows to North Africa largely reduce income inequality in the sub-region while doing the opposite in Sub-Saharan Africa.

Receipt of Foreign Aid

As Herzer and Nunnenkamp (2012) observe, for ODA to be effective in reducing income inequality in recipient countries, donors would have to allocate aid in line with their rhetoric on pro-poor growth, by targeting the most needy and deserving; and the authorities in the recipient countries would have to ensure that aid actually reaches the poor. In most cases, however, these pre-requisites tend to be violated once it is taken into account that foreign donors are not purely altruistic and local authorities have incentives to divert aid funds for personal benefit. Donors do have both altruistic and egoistic motives (Berthélemy, 2006) in addition to the incentive to "push money out the door" (Drazen, 2007: 672) even when aid has not proved effective in the past. In addition, aid conditionality may have adverse income distributional consequences since in most cases, these conditions are not pro-poor. In aid-recipient countries, as Boone (1996) observes, all political systems favor a "high-income political elite" when it comes to aid distribution. In addition, foreign aid can affect inequality through the ethnic diversity hypotheses whereby political leaders who belong to a particular ethnic group will tend to prefer that ethnic group when distributing foreign aid thus exacerbating income inequality. Moreover, rent seeking and corruption in the recipient countries could lead aid exacerbating income inequality.

Empirically, Chase-Dunn (1975) indicates that foreign aid has positive impact on income inequality while Calderón et al. (2006) finds no robust

relationship between inflows of foreign aid and income inequality except in the presence of good institutions. Bjørnskov (2010) find a negative relationship between aid and income inequality. Chong et al. (2009), using cross-section and system GMM panel techniques, find some weak evidence that foreign aid is conducive to the improvement of the distribution of income when the quality of institutions is taken into account though this result is not robust. The random effects panel analysis by Bjørnskov (2010) shows that the interaction of foreign aid and democracy in the recipient country is robustly and positively associated with income inequality. On the other hand, Shafiullah (2011) estimates fixed and random effects models and concludes that aid reduces income inequality. Saidon et al (2013), using a panel of 75 foreign aid recipient countries covering the period of 1995-2009 show that aid to the economic sector has significant impact in reducing income inequality while aid to the multi-sector significantly increases income inequality. Employing dataset covering twenty-seven countries in Sub-Saharan Africa over the period 1990-2011, Pham (2015) finds evidence of an inequality-increasing effect of foreign aid in Sub-Saharan Africa though this effect can reverse when corruption is controlled.

Democracy

There is the assumption that democratization, through the median voter hypothesis, should lead to greater redistribution and a reduction in inequality (Milanovic 2000; Gradstein and Milanovic 2004). This proposition is confirmed by the empirical results of Campante and Do (2007).

Unemployment

It is posited that there is a positive relationship between unemployment and income inequality because higher unemployment means more people without jobs or lower incomes for families. Mocan (1999) shows that increase in structural unemployment results in increasing income inequality since income inequality is countercyclical in behavior, that is, increases in unemployment worsen the relative position of low-income groups. Apart from hurting lower income groups, higher unemployment results in poorer people losing their jobs more often hence their incomes become even lower. In a study of OECD countries, Checchi and Garcia-Penalosa (2010) and Maestri and Roventini (2012) also find that higher unemployment rates increase income inequality. Monnin (2014), in a study of developed countries finds that unemployment increases income inequality. In addition, Claus, Martinez-Vazquez and Vulovic (2012), and Dincer and Gunalp (2012) show that increase in unemployment results in increasing income inequality.

To the best of our knowledge and from the literature examined, there had been no empirical analysis of the key drivers of income inequality in or for the Southern African region taken together. In addition, throughout the

literature, we did not come across the use of the double lag of the dependent variable. Part of the novelty of this paper is the remedying of this by incorporating the first two lags of the dependent variable as independent variables. Their inclusion in our model gauges not only the continued persistence of income inequality but also controls for some excluded but potentially important variables in the model. Moreover, for the sub-region, our study is the first time a long series of comparable data on income inequality through time and across countries had been applied.

5. THE MODEL, ESTIMATION STRATEGY AND THE DATA

5.1. The Model and Estimation Strategy

Since income inequality changes very slowly, current inequality is likely to be affected by inequality in the previous period(s). Due to this dynamic nature of inequality, we estimate the following dynamic panel data model:

$$\text{IncInequality}_{c,t} = \alpha \text{IncInequality}_{c,t-i} + \beta' X_{c,t} + t_t + \mu_c + \varepsilon_{c,t} \quad (1)$$

where $\text{IncInequality}_{c,t}$ represents each of our measures of income inequality in country c during period t; whereas $X_{c,t}$ represents the set of control variables that affect income inequality other than lagged Income Inequality. ε_c represents the country-fixed effects, while t_t represents the time-fixed effects, and ε_{ct} represents the error term. Our dependent variable is the market income inequality based on households' income before taxes and transfers measure (gini_market) from Solt's (2014) recently developed Standardized World Income Inequality Database (SWIID) — which ensures data comparability both through time and across countries.

Our first two independent variables are the lagged values of Gini Coefficient and we expect at least the first lag to be associated with higher contemporaneous levels of Gini Coefficient given the tendency of income inequality to persist over time. Their inclusion in our model, a novel practice to gauge the continued persistence of income inequality, also helps to control for some excluded but potentially important variables in the model.

In order to test the Kuznet's curve hypothesis, we introduce the natural log of real GDP per capita and squared term of the log of real GDP per capita. According to this hypothesis, the short-term effects of GDP per capita would increase income inequality, while long-term effects would decrease it.

Population growth is the next control variable. One would expect to observe a positive relationship between the population growth and income inequality. In order to strengthen our empirical results, we include additional control variables. One of these variables is age dependency ratio (a demographic variable consisting of the proportion of people in a country

below fifteen and the proportion of people above sixty-five years of age) to capture dependency burden.

We test the hypothesis that the diffusion of education or human capital, measured as the secondary school enrolment ratio, has a negative effect on income inequality.

The other variables are natural resources abundance to account for the extent to which dependence on natural resources affects income inequality; investment rate as a macroeconomic variable representing the use of physical capital in production; and the ratio of government consumption expenditure to GDP to account for the provision of public goods, the degree of intervention in the marketplace, and the possible use of redistributive expenditures.

Economic globalization has been postulated as a key factor driving income inequality (see, for instance, Feenstra and Hanson, 1996; Milanovic, 2005; IMF, 2007; Sturm and Haan, 2015). Along the same reasoning, apart from economic globalization, we add KOF's indices of political globalization (comprising embassies in country, membership in international organizations, participation in UN Security Council Missions, and international treaties) and social globalization (comprising personal contacts, information flows, and cultural proximity) developed by Dreher (2006, 2008).

Another financial globalization variable is international personal remittances received as a percentage of GDP to determine equalizing or unequalizing effect on the recipients in the home country. The role of foreign aid is captured by net ODA as a percentage of GDP. In order to gauge the effect of the political regime on income inequality, we use democracy (takes a value from 0 (absence of democracy) to 10 (best)) as measured by Polity2 index taken from Polity IV. Finally, there is empirical evidence that there will be positive relationship between unemployment rate and income inequality on the ground that increases in unemployment means more people lose jobs or lower incomes for families. On this ground, we include total unemployment rate.

We analyze an unbalanced pooled time series data set for income distribution in nine Southern African countries from 1970 to 2011. Given the dynamic nature of equation (1) and the presence of fixed effects to account for unobserved country heterogeneity, the equation is estimated using the Arellano-Bover/Blundell-Bond system GMM estimator. The validity of the moment conditions are carried by means of the Sargan test of overidentifying restrictions. We also test the null hypothesis of no second order serial correlation in the error term using the Arellano-Bond test for autocorrelation.

5.2. The Data

Gini coefficients can be calculated for gross income (that is, before taxes and transfers) and net income (i.e. after taxes and transfers). In this part of the analysis we use gross (market) income Gini coefficients, as we are interested in the income distribution resulting from market processes. As dependent variable we use market income inequality measure based on households' income from Solt's (2014) recently developed Standardized World Income Inequality Database (SWIID). While the Luxembourg Income Study data serves as the standard, the SWIID uses a custom missing-data multiple-imputation algorithm to standardize observations collected from the United Nations University's World Income Inequality Database, the OECD Income Distribution Database, the Socio-Economic Database for Latin America and the Caribbean generated by CEDLAS and the World Bank, Eurostat, the World Bank's PovcalNet, the UN Economic Commission for Latin America and the Caribbean, the World Top Incomes Database, the University of Texas Inequality Project, national statistical sources around the world, and many other sources. The SWIID data ensures comparability both through time and across countries.

TABLE 1.

Southern Africa: Descriptive Statistics of Main Regression Variables

Variable	Observations	Mean	Median	Standard Deviation
Gini_market	200	61.01	60.11	7.88
Log Real GDP per capita	367	6.91	6.68	1.12
Population Growth	387	2.42	2.54	0.98
Age Dependency	378	89.37	93.31	12.40
Secondary school enrolment	266	32.67	28.33	22.66
Natural resources rents (%GDP)	358	7.19	5.60	6.37
Gross capital formation (%GDP)	341	23.73	21.24	11.49
Government consumption expenditure (%GDP)	341	19.21	18.43	6.56
Economic Globalization Index	343	51.60	53.19	10.88
Political Globalization Index	343	40.94	33.54	18.79
Social Globalization Index	343	31.29	30.51	7.54
Personal remittances received (%GDP)	251	11.05	1.01	23.73
Net foreign aid (%GDP)	331	0.11	0.07	0.11
Democracy (Polity2)	353	−0.01	4	7.05
Unemployment rate	189	17.63	19.4	8.90

Source: Author's calculations, using data estimation data.

Other sets of data (1970 to 2011) for the variables in equation (1) are largely drawn from the World Bank's WDI Online database, except democracy from the Polity IV Project Online (2013) (see Marshall, 2013), and economic, political and social globalization that are from the 2015 KOF Index of Globalization. The descriptive statistics are presented in Table 1. It reports the sample mean, median and standard deviation of the variables used in the estimations.

6. THE EMPIRICAL RESULTS

The results of the Arellano-Bover/Blundell-Bond system GMM estimation are given in Table 2. The Sargan test of overidentifying restrictions is satisfactory, as is the Arellano-Bond test for AR(2) errors. The estimation model includes time dummies and robust standard errors.

There are some important results that emerge from our analysis. We find strong support for a dynamic, non-monotonic, effect of inequality in the model (as expressed by the lagged values of income inequality). Our results show a novel finding that there is a strong positive correlation between previous year and present values of income inequality. Thus, income inequality in Southern Africa is characterized by a great degree of inertia, which does not allow for a rapid and dramatic change. Indeed, higher immediate past year's levels of income inequality are associated with higher current levels of inequality and this is significant at the 1 percent significance level. This conforms to the results of Calderon and Chong (2001), Dincer and Gunalp (2012), Mahmood and Noor (2014), and Anyanwu et al (2016).

Our result, however, suggests that although higher levels of immediate past income inequality are positively and significantly associated with current levels of income inequality, above a certain point, higher levels of past income inequality act to reduce current levels of income inequality, holding other factors constant. This relationship suggests that the marginal effect of past income inequality exhibits decreasing returns for current income inequality in Southern Africa.

We find evidence of the existence of the Kuznets curve in the sub-region, which proposes that inequality may rise with the initial increase in per capita income but will decline subsequently. In our estimation, GDP per capita and the squared term of the GDP per capita enter the equation with the correct signs of the Kuznet's curve (GDP per capita is positive, while the square term is negative). While the level of GDP per capita significant at the 5 percent level of significance, its square term is significant at the 10 percent level of significance. Our finding indicates that a curvilinear relationship between economic development and income inequality is inverted U-shaped, the inflection point being real per capita income of US$1086.65.

TABLE 2.
Key Drivers of Market Income Inequality in Southern Africa (Dynamic GMM Estimates)

Variable	Coefficient	t
Gini_market_1	1.322	8.65^{***}
Gini_market_2	−0.352	-2.43^{**}
Log GDP per capita	6.879	2.59^{**}
Log GDP per capita^2	−0.492	-2.19^{*}
Population Growth	0.518	3.36^{**}
Age Dependency	−0.055	−1.79
Secondary school enrolment	−0.018	-3.35^{**}
Natural resources rents (%GDP)	−0.167	-3.07^{**}
Gross capital formation (%GDP)	0.030	2.87^{**}
Government consumption expenditure (%GDP)	−0.022	−1.28
Economic Globalization Index	−0.037	−1.35
Political Globalization Index	−0.086	-1.94^{*}
Political Globalization Index^2	0.001	2.28^{*}
Social Globalization Index	−0.016	−0.34
Personal remittances received (%GDP)	−0.033	−0.97
Net foreign aid (%GDP)	1.280	0.78
Democracy (Polity2)	−0.003	−0.14
Unemployment rate	0.027	0.46
Constant	−12.043	−1.60
Year Dummies	Yes	Yes
N	92	
Number of groups	8	
Wald test for joint significance (p-value)	0.000	
Arellano-Bond test for AR(1)	-2.02 ($pr > z = 0.043$)	
Arellano-Bond test for AR(2)	-0.73 ($pr > z = 0.463$)	
Sargan Test for overidentification	32.24 ($prob > chi2 = 0.185$)	

Note: t-statistics in brackets; *** 1% significant level; ** 5% significant level; * 10% significant level.
Source: Author's calculations.

This conforms with the case of West African countries (Anyanwu et al, 2016).

A significant positive relationship between the population growth and income inequality is found for Southern Africa. The estimates suggest that a one percentage point increase in population increases income inequality in Southern Africa by 0.52 percentage points. This implies the presence of a purely demographic mechanism suggested by Nielsen (1994). According to him, the demographic transition may affect inequality because it proxies for generalized sociocultural dualism, the general social heterogeneity resulting

from the uneven diffusion of modern technology and culture in the course of development. According to the argument, any item or trait associated with development that has implications for income and that is distributed unevenly over the population will generate its own sectoral inequality. Since these mechanisms are at work in Southern African countries during the period under study, the natural rate of population increase has significant positive effect on income inequality in the sub-region.

Access to secondary education (skill premium) has significant negative impact on income inequality in Southern Africa in conformity with the findings of Knight and Sabot (1983), Crenshaw and Ameen (1994), Park (1996), Barro (2000), and Checchi (2001), and Alderson and Nielsen (2002), Calderon and Serven (2004), Dincer and Gunalp (2012), and Anyanwu et al (2016). This means that the "compression effect" is greater than "composition effect" in Southern Africa. Our results therefore indicate that as education diffuses throughout the population, the supply of skilled workers increases, reducing the wage differential between the skilled and unskilled. Our estimates suggest that a one percentage point increase in secondary education enrolment is associated with a reduction in income inequality in the sub-region by 0.02 percentage point.

Furthermore we find very significant evidence that natural resources rents are negatively associated with income inequality in Southern Africa, contrary to the results of Buccellato and Alessandrini (2009) as well as Anyanwu et al (2016) and inconsistent with the resource curse effect. Our estimates indicate that a one percentage point increase in natural resources rent is associated with decrease in income inequality in Southern Africa by 0.17 percentage point. This provides strong evidence that natural resource dependence reduces the possibility of rent capture and the creation of a rentier state which exacerbates the income inequality not only because of the rent extraction by the ruling elite but also because of limited redistribution towards the lower socioeconomics segments of the population. Our results conform with the results of Mallaye et al (2015) who find negative effect of oil rent though this turns positive when interacted with corruption. This attests to the fact that a number of countries in the sub-region, including Botswana and South Africa, have been able to manage their natural resources rents, especially through good governance, to improve the welfare of their citizens, at least in comparison to most countries in Sub-Saharan Africa.

Our results show that investment promotes income inequality and it is significant at the 5 percent significance level, reflecting enormous wastes, especially in public sector investments in the sub-region with many uncompleted or poorly executed "white elephant" projects littered all over the countries. The estimates suggest that a one percentage point increase in domestic investment rate is associated with increase in income inequality

in the sub-region by 0.03 percentage point. This shows that in Southern Africa, the use of capital in the production of skill-intensive goods tends to be inequality increasing through the positive demand for skilled labor. Székely and Sámano (2012) do not find a significant effect of the investment rate on income inequality in Latin America while Lee et al (2013) find negative significant effects for Korea just as Chaudhry and Imran (2013) did for Pakistan. Anyanwu et al find positive significant effect for investment rate for West African countries, consistent with the finding here with respect to Southern Africa.

We investigated aspects of globalization that have been implicated in the upswing in global income inequality. Our results indicate that both economic and social globalization have no significant effect on income inequality in the Southern African sub-region. However, our results show, as in the case of income per capita, there is a non-monotonic effect of political globalization on income inequality. The level of political globalization and its squared term are statistically significant at the ten percent significance level. While the level of political globalization exhibits a negative significant effect, its squared term is significantly positive, showing an inverted Kuznet's form relationship unlike in West Africa where it exhibits a Kuznets type relationship (Anyanwu et al, 2016). Therefore, the persistent high levels of income inequality experienced by Southern African countries are attributed to both country-specific policies and broad forces related to political globalization.

Other factors found not to have significant relationship with income inequality in Southern Africa are age dependency, government expenditure, personal remittances, net foreign aid, democracy, and unemployment rate.

7. CONCLUSION AND POLICY IMPLICATIONS

Thus far, we have shown why income inequality matters and hence why policymakers need to put high and increased focus on it so as to bring it down sustainably. We have also, unlike in previous studies, used the most comprehensive data set on market and net income inequality covering nine Southern African countries over three decades to present some new, interesting stylized facts on income inequality in Southern Africa. Also, we have empirically assessed the impact of key domestic and external drivers of income inequality in the sub-region, using the dynamic system GMM method.

Some key findings emerge. First, we have a novel finding that shows strong support for a dynamic, non-monotonic, effect of inequality in the model, whereby higher levels of past income inequality are positively associated with current levels of income inequality, but above a certain point, higher levels of past income inequality act to reduce current levels of in-

come inequality, holding other factors constant. Second, we find evidence of existence of the Kuznets curve in the sub-region, which proposes that inequality may rise with the initial increase in per capita income but will decline subsequently. Third, higher population growth appears to be income equalizing in Southern Africa. Fourth, access to secondary education (skill premium) is income equalizing in the sub-region. Fourth, against the suggestion of the resource curse syndrome, natural resources rents are income disequalizing in Southern Africa. Fifth, reflecting enormous waste in investment projects in the sub-region, domestic investment promotes income inequality instead of decreasing it. Sixth, a non-monotonic, inverted Kuznets-type effect is found for political globalization.

Our empirical findings point to some key policy lessons and recommendations for the sub-region. These are discussed below.

Promotion of Inclusive Economic Development

Our results point to promoting the attainment of higher economic development (national incomes) as one of the most effective ways to achieving relatively more egalitarian growth path. To increase per capita income, Southern African countries must deepen macroeconomic and structural reforms to increase their competitiveness, create increasing and more quality jobs and hence increase participation in economic activity. They must also dismantle existing structural bottlenecks to private and public investment, scale-up investments in hard and soft infrastructure, check rapid population growth, and increase productivity, especially in agriculture, through creating incentives and opportunities for the private sector and increasing government support to small farm holders in terms of finance, formalization of land ownership, and technical advice.

Improvement of Inclusive Socio-Economic Opportunities

From our results, one of the most effective ways towards achieving relatively more egalitarian society is increased access to education. This calls for active social intervention, including targeted and high-quality education and training policies, and up-skilling, technical, vocational and entrepreneurial education aimed at increasing the supply of skilled labor. Actions to equalize opportunities in formal education need to ensure that all children acquire at least a basic level of skills necessary to participate in society and in today's global economy. As the World Bank (2005) had argued, greater access should be complemented by supply-side policies (to raise quality) and demand-side policies (to correct for the possibility that parents may under-invest in the education of their children for various reasons). Supply side policies would include increasing teachers' incentives, enhancing the basic quality of schools' physical infrastructure, and researching and implementing teaching methods to increase the learning

performance of students who do not do well when left to their own devices. On the other hand, demand side policies would include scholarships conditional on attendance, bringing in excluded groups and to bring up those left behind through remedial education, and developing the accountability of schools and teachers to students, parents, and the broader society to help ensure effective service provider behavior (World Bank, 2005; Burnett et al, 2013).

However, for higher incomes to be inclusive and income inequality-reducing, they must be accompanied by policies, which enhance poor people's opportunity to benefit, including targeted subsidies (high-yielding seeds, fertilizer, fuel and energy),the improvement of rural infrastructure (not just the urban ones), and the enforcement of minimum wage laws in both the public and private sectors of the economy. It will also include the creation of incentives for lowering informality by increasing the benefits of participating in the formal sector and by reducing the costs of doing so (Dabla-Norris and Inchauste, 2008), and providing the enabling environment for private sector development, especially for small and medium enterprises (SMEs).

Checking High Population Growth

Given that income inequality increases with population growth in the sub-region, there is urgent need to intensify family planning services efforts and activities in the sub-region so as to improve knowledge, acceptance and practice (KAP) of family planning. This will involve not only increased financial outlay but also research on fertility determinants as well as decentralized planning, delivery and supervision of family planning services (Anyanwu et al., 1998a, 1998b). Governments at various levels need to address the problems of low access to contraceptives by married couples and high HIV/AIDS infection and mortality. A clear focus on healthcare and the structural issues, with free or subsidized contraceptives for married couples who lack access and scaled up public health education will go a long way in reducing population and its income inequality-related costs.

Negotiating Better Contracts and Better Natural Resources Management

Following our finding that natural resource rents reduce income inequality in Southern Africa, international financial institutions like the African Development Bank have a critical role to play in continuing to help these countries acquire the much-needed capacity not only to negotiate beneficial contracts and earn higher rents but also for effective management of natural resources rents and other related revenues. In particular, a new natural resources management framework is needed for better governance, saving for future generation (like the Botswana Pula Fund), sectoral linkages, economic growth and human, capacity and infrastructure development — with

strong parliamentary legislation, oversight, and representation throughout the natural resources value chain.

Promotion of Productive Investment Practices

Reducing income inequality in Southern Africa also calls for increased productive domestic investment, public and private. Productive and efficient domestic investment requires the development of coordinated, objective and transparent processes for decision-making based on thorough and rigorous cost-benefit analysis. Political will and good governance, strengthening accountability and transparency as well as enlarging civil society space as a "watch dog" are critical in this direction.

Attention should be paid to both the design, implementation, and monitoring and evaluation phases of projects and programs. At the design stage, the aim should be to create achievable and quantifiable targets and to have all-stakeholder ownership through the collaboration of governments, the private sector, civil society and other development agencies. All stakeholders must follow through to ensure that projects and programs are implemented as designed. Also, stakeholders must ensure that those projects and programs are regularly monitored and evaluated against indicators established in the design phase and that are agreed on by the development partners.

Effective Management of Globalization

Going forward, one of the key things Southern Africa needs in achieving inclusive and sustainable development by harnessing the positive aspects of political globalization will involve multi-stakeholder and multi-sectoral partnerships across borders that can combine the assets, creativity, and experience of the strategic partners, leveraging their resources for people-oriented development. Such innovative, cross-border multi-stakeholder and multi-sectoral partnerships must be ones characterized by shared vision, interdependence and complementarity, joint resources mobilization and resources sharing, deepening of sub-regional integration, joint investments in human and social capital as well as physical infrastructure (especially communications and transportation) with prospects for scaling up and institutionalization, and very strong endorsement and consistent support from senior leadership. These are the basic ingredients for the success of such new strategic alliances. The key role of government under such strategic alliances is that of an enabler, providing a "level-playing" field, embedding of social objectives in external relations, building the legal, institutional and regulatory frameworks for social and political globalization to thrive — as opposed to excessive or cumbersome regulatory barriers that stifle incentives and discourage enterprise, free exchange and harmonious co-existence.

Finally, urgent reforms to make multilateral organizations more representative, cooperative and coordinated in decision-making, fairer, more balanced, equitable, participatory, democratic, accountable, transparent and coherent are needed at the level of the United Nations.

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