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Why is inequality so high, but also so variable, in Sub-Saharan Africa?

Edward Anderson and Andy McKay

Poverty and Public Policy Group

Overseas Development Institute

London

e.anderson@odi.org.uk

a.mckay@bath.ac.uk

Abstract

Levels of income and/or consumption inequality are on average at least as high in sub-Saharan Africa as they are in Latin America. They are also highly variable. The paper makes an initial attempt to explain these findings using cross-country econometrics. We find that around 50% of the region's high level of inequality can be attributed to its underlying factor endowments, notably its high ratios of land to labour ratios, its sometimes high ratios of known minerals to land ratios, and the large proportion of its land area which is located in the tropics. However, the same factors account for only a small proportion of the variation in levels of inequality within the region. A fuller explanation will require further work, with the most promising route being case-study analysis.

1 Introduction

When we think of the most unequal region in the world, we tend to think of Latin America. However, a quick glance at Figure 1 shows that levels of inequality are as high, on average, in sub-Saharan Africa. The measure of inequality shown is the Gini coefficient, but a similar result holds if we look at another measure of inequality, the share of the poorest quintile in national income (Figure 2).

A considerable amount of effort has been spent seeking to understand the various reasons for the high levels of inequality witnessed in Latin American societies. The most recent example is the 400-page World Bank (2003) study 'Inequality in Latin America and the Caribbean: breaking with history?' There is also a widespread consensus that addressing inequality is an essential pre-requisite for any sensible long-term strategy for reducing poverty in the region. The same cannot be said for sub-Saharan Africa. On the one hand, there have been fewer attempts to understand the causes of high levels of measured inequality in many African societies. On the other hand, there is much less agreement about the extent to which explicit efforts to tackle inequality need or should be part of strategies for reducing poverty in the region.

This paper begins to fill these gaps in our knowledge, by asking why levels of inequality are so high in sub-Saharan Africa. In doing so, an important task is to explain not only the high *average* level of inequality but also the large amount of *variability*. Even among the low-income countries of the region, recent gini coefficients of income or consumption inequality vary from 0.33 in Ghana, which is low by international standards, to around 0.50 in Nigeria and Zambia, which is high by international standards, to above 0.60 in Malawi, which is exceptionally high by any standard (see next section).

A large body of recent research has highlighted the potentially adverse consequences of high inequalities for economic growth and poverty reduction. High inequalities reduces the impact of a given rate of economic growth on poverty, as has been shown by Ravallion (2001) and Hanmer and Naschold (2000) (although these studies differ in their estimates of by exactly *how much* inequality affects the impact of growth).

They are also likely to lower the rate of growth itself. The basic motivation of this paper is that an improved understanding of the reasons for the high average level of inequality in sub-Saharan Africa, as well as its variability, is essential if inequalities are to be tackled effectively.

2 The evidence

In this section we review what we know about levels of inequality in individuals' or households' well-being, in African societies relative to other regions. The difficulties of compiling such estimates for a large number of countries means that the evidence is limited mainly to income or consumption inequality, but we present some evidence on inequalities in education attainments and health status. Evidence on inequalities in assets (e.g. land), which contribute to inequalities in well-being but are not aspects of well-being in themselves, are considered later (Section 4).

Income/consumption inequality

Table 1 shows the list of countries in sub-Saharan Africa contained in the Dollar and Kraay (2002) dataset, together with the most recent estimates for each one of the Gini coefficient and the share of the poorest quintile in national income, and information regarding the type of survey from which these figures are calculated. The majority (80%) refer to inequality in consumption levels across individuals. However, they all relate to different years, and several are by now quite out of date.

Some of the difference between the average level of inequality in sub-Saharan Africa and other regions shown in Figures 1 and 2 may reflect differences in the year in which inequality is measured and in the type of survey on which estimates of inequality are based. We control for these differences by estimating a cross-country regression of the form:

$$\begin{aligned} INEQ_i = {} & \alpha + \beta_1 \cdot SSA_i + \beta_2 LAC_i + \beta_3 SA_i + \beta_4 EAP_i + \beta_5 MENA_i + \beta_6 EECA_i \\ & + \beta_7 INC_i + \beta_8 PER_i + \beta_9 GRS_i + \beta_{10} YR_i + \beta_{11} YR_i^2 + \varepsilon_i , \end{aligned} \tag{1}$$

where $INEQ_i$ is the most recent estimate of income or consumption inequality in country *i*; SSA_i, LAC_i, SA_i, EAP_i, $MENA_i$ and $EECA_i$ are dummy variables equal to 1 if the country is in sub-Saharan Africa, Latin America and the Caribbean, South Asia, East Asia and the Pacific, Middle East and North Africa or Eastern Europe and Central Asia (as defined by the World Bank) respectively, and 0 otherwise; INC_i equals 1 if the inequality estimate refers to income inequality, and 0 if it refers to consumption inequality; PER_i equals 1 if the inequality estimate refers to personal income or consumption, and 0 if it refers to household income or consumption; GRS_i equals 1 if the inequality estimate refers to gross income (before taxes and transfers), and 0 if it refers to net income (after taxes and transfers); YR_i is the year of the inequality estimate, and ε_i is the residual term.

The results are shown in Table 2. When controlling for the type and date of the income or consumption inequality estimates, sub-Saharan Africa has the highest average Gini coefficient of all regions (20 points above the average in high-income countries), closely followed by Latin America and the Caribbean (17 points above the average in high-income countries). It also has the lowest average share of the poorest quintile in national income (3.3 percentage points below the average in high-income countries), again closely followed by after Latin America and the Caribbean (3.1 percentage points below the average in high-income countries).

Some of the variability in inequality within sub-Saharan Africa may also reflect differences in the type and year of the survey on which estimates are based. To control for this, we also examine the variance of the residuals from regression (1) across regions. The results, also shown in Table 2, show that the amount of variation (as measured by the coefficient of variation) in levels of inequality within Sub-Saharan Africa remains high, relative to most other regions. When considering the income share of the poorest quintile, only Middle East and North Africa region shows more variation; when considering the Gini coefficient, only the Middle East and North Africa and Central Asia and Eastern Europe show more variation.

There are of course some questions the comparability of the inequality data in this as with any other cross country inequality study (see Atkinson and Brandolini, 2001, in the context of OECD countries). Individual country inequality measures are constructed using different approaches (income or consumption, adjustments for price differences, whether the distribution is over individuals or households and so on), and these differences can only be partly controlled for in the above econometric analysis. In addition, inequality data is not available for many countries, and the available estimates relate to a wide variety of years. The comparison though is based on estimates believed to be of high quality and broadly comparable (as assessed initially by Deininger and Squire, 1996, and updated by later authors). In other words, the above comparisons are based on the best data set currently available for this purposes. Overall therefore, there it appears that the two central issues addressed by this paper – the high average level and large variation of income and/or consumption inequality in sub-Saharan Africa – are real features of the data

Education inequalities

Educational attainment is both an aspect of well-being in itself and a determinant of other dimensions of well-being (e.g. consumption, via its effects on productivity and earnings). In this sense it is appropriate to consider here cross-country evidence relating to educational inequalities provided by Thomas *et al.* (1999). These authors calculate Gini coefficients for educational attainment, measured by schooling years, among the population aged 15 and above, for 85 developed and developing countries between 1960 and 1990.

Differences in this measure of educational inequality between developing country regions are shown in Figure 3. The data relate to 1990. In this case there is a clear difference between the two low-income regions SSA and SA – with high levels of educational inequality – and the two middle-income regions LAC and EAP – with lower levels of educational inequality. Nevertheless, there is again a substantial amount of variation in levels of educational inequality within the SSA region.

Health inequalities

[Insert discussion here of evidence on health inequalities].

3 Understanding inequality in sub-Saharan Africa

3.1 Land-labour ratios

Average land-labour ratios differ significantly between Latin America and sub-Saharan Africa on the one hand, and South Asia and East Asia and the Pacific on the other (Wood 2003, Table 1). These differences provide the most obvious explanation for the differences in average levels of inequality between regions. Neo-classical economic theory predicts that countries with higher land-labour ratios will typically have higher levels of income inequality than other countries (all else being equal), because land will account for a greater share of national income relative to labour, and because land is a less equally distributed asset than labour.[1] Support for this prediction has been found in recent empirical work (e.g. Leamer *et al.* 1999, Spilimbergo *et al.* 1999).

There is also a large amount of variation in land-labour ratios within sub-Saharan Africa: from 0.5 square kilometres of land per 100 adults in Rwanda to more than 50 square kilometres in Mauritania (Wood 2003, p. 166). It is also possible that this variation could account for the variation in levels of inequality. Figure 4 shows that there is a clear positive relationship within the region between land-labour ratios and the Gini coefficient.

Levels of inequality are also affected by other factor endowment ratios. For instance, Leamer *et al.* (1999) show that levels of inequality tend to decline as levels of human capital per worker (typically proxied by average years of schooling in the adult population) rise. This could explain why the average level of inequality in sub-

[1] This need not necessarily be the case. The link between factor endowment ratios and the factor distribution of income depends on the various elasticities of substitution between factors in production. For instance, [in a two-factor model] a rise in the land-labour ratio will increase the share of land relative to labour in national income if the elasticity of substitution between land and labour is greater than one, and reduce it if the elasticity is less than one. These elasticities are affected by technological change and by the extent of openness to trade. The link between the factor distribution of income and the distribution of income is also affected by inequalities in the ownership of assets (see Section 3.2).

Saharan Africa is much higher than in East Asia and the Pacific, where average years of schooling are much higher (Table 1, Wood 2003). However, it could not explain why the average level of inequality is also much higher than the level in South Asia, where average years of schooling are similar. Nor can it explain why the average level of inequality in sub-Saharan Africa is similar to that in Latin America, where average years of schooling are much higher (*ibid.*). Moreover, there is much less variation in average years of schooling, within sub-Saharan Africa which could account for the variation in levels of inequality within the region.

One other factor endowment ratio which may be correlated with inequality is the ratio of minerals (e.g. oil, metals, diamonds). Again, the hypothesis is that countries with higher endowments of minerals per land area will tend to have higher levels of income inequality (all else being equal), because minerals will account for a greater share of national income, and because the returns to minerals are (like those to land) typically unequally distributed. High measured inequality in some African countries (e.g. Nigeria, Sierra Leone, Botswana) may well reflect their large relative endowments of minerals.

3.2 Land inequalities

The effect of high land-labour ratios on income inequality will be compounded if land ownership is highly unequal. Inequalities in land ownership are typically determined by historical factors, and change little over time except during or immediately after periods of substantial change (revolution, independence, war). But they do often vary across countries. It is therefore possible that the high level of income/consumption inequality in sub-Saharan Africa reflects particularly high inequality, and/or that variation in land inequality within the region account for the observed variations in income/consumption inequality.

Estimates of land inequality in sub-Saharan Africa are shown in Table 3. The data are taken from Deininger and Squire (1998) and IFAD (2001). They are clearly limited, in that estimates are available for a subset of countries only 16 countries in the region only, and some of these are by now quite out of date. Notwithstanding this caveat, they show no evidence that inequalities of land ownership are significantly higher in

sub-Saharan Africa than in other regions. Furthermore, there is little correlation between observed levels of land inequality and income inequality within sub-Saharan Africa. Some countries in the region (e.g. Seychelles, Madagascar, and Tanzania) have low levels of income inequality despite high levels of land inequality, while others (e.g. Lesotho and Sierra Leone) have high levels of income inequality despite low levels of land inequality. The lack of correlation is shown graphically in Figure 5.

3.3 Openness

A large amount of attention in recent years has been devoted to the issue of whether economic openness – to trade, investment, and migration – affects levels of inequality within countries. (A recent review of this literature is provided by Anderson 2004). Economic theory does not provide unambiguous predictions regarding the effects of openness. Heckscher-Ohlin trade theory predicts that, in countries with high land-labour ratios and low skill-labour ratios, increased openness would raise the returns to land relative to labour, but reduce the returns to skilled relative to unskilled labour – leaving the effect on overall inequality uncertain.

Do levels of openness in sub-Saharan Africa differ on average from those in other regions? The clearest difference in average levels of trade openness between regions, measured by the Sachs and Warner (1995) trade policy index, is between sub-Saharan Africa and South Asia on the one hand (less open), and Latin America and East Asia on the other hand (more open) (column 1, Table 4). Other measures of trade openness, such as the Frankel and Romer (1999) predicted trade share, differ only marginally between regions (column 2, Table 4). Furthermore, there is no apparent correlation between levels of trade openness measured in these ways and income inequality within Sub-Saharan Africa, as indicated by Figures 6 and 7.

3.4 Other

Differences in political institutions between countries in the region may also explain differences in inequality. One hypothesis is that where the majority of citizens possess political and civil liberties, they are more able to prevent a rich minority from

expropriating an excessive share of national wealth. Evidence in support of this hypothesis has been found recently by Li *et al.* (1998). The average level of political rights as measured by the Freedom House International is substantially higher (indicating less rights) in sub-Saharan Africa than it is in other regions (column 3 in Table 4). This could therefore account for the high levels of inequality in the region. However, differences in average levels of civil liberties between regions, which should also affect inequality, are smaller. Furthermore, there is no clear relationship between measured levels of political liberties within sub-Saharan Africa, as shown in Figure 8.

It has been argued in previous work that high levels of ethnic diversity have had a negative impact on economic growth in sub-Saharan Africa, by contributing to conflict and corruption (e.g. Easterly and Levine 1997; Mauro 1995). They may also have contributed to the high levels of inequality in the region and/or the variations in inequality within it. Pressures for the redistribution of assets and/or incomes may be higher and more successful when countries are more ethnically homogenous. A common measure of ethnic diversity is the probability that two individuals from a country will speak a different language. The average value of this variable is in fact no higher in sub-Saharan Africa than it is in South Asia (column 5, Table 4). Moreover, there is no clear relationship between this variable and levels of inequality within sub-Saharan Africa, as shown by Figure 9.

Finally, there is a geographical element to inequality in sub-Saharan Africa, in that levels of inequality tend to be highest in Southern Africa, including Namibia, South Africa, Lesotho, Botswana, Malawi and Zimbabwe. The relationship between countries' and inequality, shown in Figure 10, is positive and marginally statistically significant.

3.5 Econometric analysis

In this section we estimate the determinants of income/consumption inequality using econometric analysis. We then examine the extent to which observable influences on inequality can account for the high average level of inequality in sub-Saharan Africa, as well as the large amount of variation within it. The explanatory variables are:

- land-labour ratios (area divided by the population aged 15-64, from World Development Indicators), relative to the world average;[2]
- the value of known (in 1990) metal, gas, coal and oil reserves per unit of land area, from Wood and Mayer (2001);
- average years of schooling in the adult population, from Barro and Lee (2000);
- trade openness, as measured by the Sachs and Warner (1995) index of trade policy openness and the Frankel and Romer (1999) predicted trade share;
- per capita GDP, and its square, in US$ PPP (from Dollar and Kraay 2002);
- distance from the equator, from Hall and Jones (1999);
- ethno-linguistic fragmentation, from Easterly and Levine (1997);
- index of political rights, from Freedom House International.

We allow for the effect of land-labour ratios and average years of schooling on income/consumption inequality to vary with the level of trade openness, as neo-classical theory predicts.

We estimate the equation using pooled cross-section and time-series inequality data used by Dollar and Kraay (2002). All other variables are measured for the closest year available. We include controls for the year and year squared, to allow for a potential common time trend (linear or non-linear) in levels of inequality over the period from which inequality observations are derived. We also include controls for when income is measured net of taxes and transfers, and when inequality in consumption rather than income, or between households rather than individuals, is being measured. All variables are observed for a total of 163 country-year observations, of which 17 are from sub-Saharan Africa. We do not include land inequality in the regression, because this limits the sample too much.

The regression results when using the Gini coefficient as the dependent variable are shown in Table 5. Column (1) shows the average levels of the Gini coefficient in each region in this sample when controlling only for the year of observation and the

[2] Ideally, we would measure each country's factor endowment ratios relative to the effective world average, as Spilimbergo *et al.* (1999) do.

type of survey. Column (2) includes the remaining explanatory variables with the exception of trade openness. Column (3) includes the Sachs and Warner (1995) measure of trade openness, which is interacted with each of the factor endowment ratios. Column (4) includes the Frankel and Romer (1999) measure of trade openness instead, again interacted with each of the factor endowment ratios.

The results are generally as expected. Considering first column (2), land-labour and mineral-land ratios have positive effects on the Gini coefficient, while capital-labour ratios have a negative effect. All three variables are statistically significant at the 10% level. Ethno-linguistic diversity also has a positive effect on the Gini coefficient, but the effect is not statistically significant. An improvement in civil liberties (represented by a fall in the Freedom House index) has a negative effect on the Gini, as expected, but the effect is not statistically significant. Latitude has a negative effect on inequality – which is the opposite of the pattern observed within sub-Saharan Africa. There is a statistically significant inverse-U shaped relationship – the famous Kuznets curve – between per capita income and the Gini coefficient. The results are quite similar when using the income share of the poorest 20% as the dependent variable (see Table 6).

Turning to columns (3) and (4), most coefficients change little in size, although levels of statistical significance are sometimes lower. The interactions between average years of schooling and trade openness are positive, as expected, but they are not statistically significant. The interactions between land-labour and mineral-land ratios and trade openness are in fact negative in column (4), which is contrary to expectation, but again neither is statistically significant.

Of particular interest is the size of the coefficient on the dummy for sub-Saharan Africa in each column. Comparing columns (1) and (2) suggests that roughly half of the higher average level of Gini coefficients in the region compared to developed countries can be accounted for by the additional explanatory variables included in column (2). Including trade openness and its interaction with factor endowment ratios adds little if anything to this figure. The proportion of the lower average income share of the poorest 20% which can be explained is very similar (between 40% and 50%). Analysis of the residuals from these regressions suggests that the amount of

the variation in inequality levels within sub-Saharan Africa which can be explained by the above variables is much smaller, at between 10% and 20%.

It seems therefore, that cross-country econometrics can provide only a partial explanation of the high but variable levels of inequality in the region. What other factors are likely to be responsible? They are likely to include the amount of inequality in land ownership, the amount of redistribution (or lack of it) carried out by governments, spatial inequalities, gender inequalities, and ethnic inequalities, all of which we have for reasons of lack of data been unable to include in the above regressions. Assessing the influence of these factors, and their own underlying determinants, can most reasonably be carried out through case-study analysis.

3.6 Case study evidence on inequality

A better understanding of the factors underlying high, and variable, levels of inequality in Africa is likely to need to be based on strong case study evidence. Survey data is now available for a large number of Africa countries which can enable such an analysis, at a microeconomic level in terms of the explanatory factors typically available in such surveys.

To date though there have been relatively few studies of factors associated with the levels of inequality in different African countries, although there have been studies of factors influencing changes in inequality, and in particular how these relate to economic reform – where there does not appear to be a systematic pattern (Christiansen, Demery and Paternostro, n.d.). This study drew on a number of country case studies using household survey data, and some of these provide more initial information about inequality within countries, in particular comparing inequality levels across groups of households (e.g. by location and main economic activity – for instance Coulombe and McKay, 2003, for Ghana). Other studies have used Demographic and Health Survey data to look at non-income dimensions of inequality (reported in Christiansen et al, n.d.) and to look at urban-rural inequality (Sahn and Stifel, 2002). A common finding from inequality decompositions in low income African countries is that only small proportions of inequality are explained by

inter-group inequality, with the large majority of inequality being among the groups identified in these studies.

4 Conclusions and next steps

Latin America is typically viewed as the region of the world in which inequalities between rich and poor are highest, and represent the most pressing concern for policy-makers and aid donors. This short paper highlights the fact that the average level of income and/or consumption inequality are at least as high, if not higher, in sub-Saharan Africa, although there is much variation within the region. The paper makes an initial attempt to explain this finding using cross-country econometrics. It finds that much of the region's high level of inequality – around 50% – can be attributed to its underlying factor endowments, notably its high ratios of land to labour ratios, its sometimes high ratios of known minerals to land ratios, and the large proportion of its land area which is located in the tropics. All these variables are shown in cross-country regressions are shown to be associated quite robustly with higher inequality. However, they account for only a small proportion of the variation in levels of inequality within the region, which remains largely unexplained.

These findings raise more questions than they answer. What factors account for that part of the high average level of inequality in the region, and its variation, which econometrics is unable to explain? We speculate that they relate to the distribution of land ownership, the extent of government redistribution (or lack of it), and of so-called 'horizontal' or inter-group inequalities. The most promising route of enquiry to assess the contribution of these factors to inequality in the region is through case-study analysis, as they are all difficult to measure in one let alone several different countries.

From the point of view of policy, the first issue which needs exploring further is whether the case for addressing inequality explicitly is any way different in sub-Saharan Africa to the case in Latin America. The main difference, of course, is that Latin America is a predominantly middle-income region, while sub-Saharan Africa is a predominantly low-income region. It can be and often is argued that low-income

countries and their governments do not have the resources for achieving much redistribution, unlike their middle-income country counterparts.

Another issue which needs exploring further is how the underlying reasons for high inequality in the region affect the choice of policies or instruments for addressing inequality. The results in this paper suggest that high land-labour ratios, relative to other regions are an important determinant of inequality in the region. The high level of these ratios *relative to other regions* is unlikely to change much in future years. The implication is that inequality in the region may be highly persistent without significant land reform or redistribution.

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Table 1

Country	Gini	Income share of 1st quintile	Year	Income/ consum -ption survey	Person/ house- hold	Gross/ net
Burundi	33.3	7.9	1992	C	P	N
Burkina Faso	39.0	5.5	1995	C	P	N
Botswana	54.2	3.6	1986	C	H	N
Central African Republic	61.3	2.0	1993	C	P	N
Cote d'Ivoire	38.0	7.1	1995	C	P	N
Cameroon	49.0	.	1983	C	P	N
Djibouti	38.1	.	1996	C	P	N
Ethiopia	44.2	7.1	1996	C	P	N
Gabon	63.2	2.9	1977	Y	H	N
Ghana	32.7	8.4	1997	C	P	N
Guinea	40.4	6.4	1995	C	P	N
Gambia, The	47.8	4.4	1992	C	P	n.a.
Guinea-Bissau	56.1	2.1	1991	C	P	N
Kenya	57.5	5.0	1994	C	P	N
Lesotho	57.9	2.6	1993	C	P	N
Madagascar	43.4	5.8	1993	C	P	N
Mali	50.5	4.6	1994	C	P	N
Mozambique	39.6	6.5	1996	C	P	N
Mauritania	38.9	6.2	1995	C	P	N
Mauritius	36.7	6.7	1991	C	P	N
Malawi	62.0	.	1993	C	P	N
Namibia	74.3	1.5	1993	C	P	N
Niger	50.5	7.5	1995	C	P	G
Nigeria	50.6	4.4	1997	C	P	N
Rwanda	28.9	9.7	1984	C	P	N
Sudan	40.0	5.6	1969	Y	P	G
Senegal	41.3	6.4	1994	C	P	N
Sierra Leone	62.9	1.1	1989	C	P	G
Seychelles	47.0	.	1984	C	P	N
Chad	35.0	8.0	1958	Y	P	G
Tanzania	38.2	6.8	1993	C	P	N
Uganda	39.2	6.6	1993	C	P	N
South Africa	59.3	2.9	1994	C	P	G
Zambia	49.8	4.2	1996	C	P	N
Zimbabwe	56.8	4.0	1990	C	P	N

Source: Dollar and Kraay (2002)

Table 2

	Unadjusted	Unadjusted	Adjusted	Adjusted
	Average level*	Coefficient of variation**	Average level*	Coefficient of variation**
Gini coefficients				
Sub-Saharan Africa	13.8	0.23	19.7	0.22
East Asia and Pacific	5.0	0.16	9.5	0.17
South Asia	1.2	0.08	7.8	0.07
Latin America and the Caribbean	14.2	0.15	17.0	0.14
Middle East and North Africa	6.8	0.29	13.4	0.28
Eastern Europe and Central Asia	0.7	0.22	-9.5	0.48
Income share of poorest quintile (%)				
Sub-Saharan Africa	-1.5	0.42	-3.3	0.39
East Asia and Pacific	0.0	0.27	-1.5	0.19
South Asia	1.6	0.08	-0.5	0.09
Latin America and the Caribbean	-2.3	0.41	-3.1	0.27
Middle East and North Africa	-0.5	0.42	-2.7	0.50
Eastern Europe and Central Asia	0.5	0.30	2.3	0.21

Notes: *Relative to high-income countries. ** Defined as the standard deviation divided by the mean.

Table 3

Country	Income/ consumption Gini coefficient	Year	Land Gini coefficient	Decade	Source
Cote d'Ivoire	38	1995	42.29	1970s	IFAD
Ethiopia	44.2	1996	47.01	1980s	IFAD
Guinea	40.4	1995	50.99	1980s	IFAD
Kenya	57.5	1994	77	1980s	IFAD
Lesotho	57.94	1993	36.2	1970s	Deininger & Squire
Madagascar	43.44	1993	80	1980s	IFAD
Mali	50.5	1994	47.76	1960s	Deininger & Squire
Mauritania	38.9	1995	58.58	1980s	IFAD
Niger	50.5	1995	31.77	1980s	Deininger & Squire
Sudan	40	1969	57.65	1960s	IFAD
Senegal	41.28	1994	49.27	1960s	Deininger & Squire
Sierra Leone	62.9	1989	47.74	1980s	IFAD
Seychelles	47	1984	82.06	1970s	IFAD
Tanzania	38.2	1993	78.99	1980s	IFAD
Uganda	39.2	1993	58.96	1990s	Deininger & Squire
South Africa	59.3	1994	70.1	1960s	Deininger & Squire
Regional averages:			*Land Gini*	*No. of observations*	
Sub-Saharan Africa			57.3	16	
East Asia and Pacific			52.1	10	
South Asia			57.2	5	
Latin America and the Caribbean			78.3	25	

Table 4

	Sachs and Warner (1995) trade policy measure	Frankel and Romer (1999) predicted trade share	Freedom House index of civil liberties (1=highest, 7=lowest)	Freedom House index of political rights (1=highest, 7=lowest)	Ethno-linguistic diversity
Sub-Saharan Africa					
-Mean	0.35	2.9	4.7	4.8	0.65
-No. of obervations	26	35	33	33	30
East Asia and Pacific					
-Mean	0.67	2.3	4.3	3.9	0.55
-No. of obervations	9	10	13	13	6
South Asia					
-Mean	0.40	2.2	4.4	2.8	0.67
-No. of obervations	5	5	5	5	4
Latin America and the Caribbean					
-Mean	0.86	2.8	2.8	2.7	0.28
-No. of obervations	22	26	23	23	23

Table 5

	1	2	3	4
(Constant)	66.07	-148.81	-168.57	-144.23
	5.5	-3.2	-3.2	-3.1
Land-labour ratio		1.48	1.39	1.37
		4.9	2.2	1.2
Average years of schooling		-2.54	-3.03	-7.78
		-1.9	-2.0	-2.1
Minerals-land ratio		1.62	0.45	3.09
		1.7	0.2	0.7
Trade openness			-0.97	-1.87
			-0.7	-2.1
Land-labour ratio*trade openness			0.06	-0.07
			0.1	-0.2
Capital-labour ratio*trade openness			1.84	2.05
			0.8	1.6
Minerals-land ratio*trade openness			1.41	-0.56
			0.6	-0.4
Latitude		-0.11	-0.12	-0.13
		-2.5	-2.7	-3.0
Ethnolinguistic diversity		2.34	2.69	0.90
		1.2	1.4	0.5
Civil liberties (1=highest, 7=lowest)		0.27	0.26	0.07
		0.7	0.7	0.2
Log average income (1985 US$ PPP)		52.99	58.17	53.95
		4.9	4.6	5.0
Per capita income squared		-3.33	-3.63	-3.40
		-5.0	-4.6	-5.0
Income survey (1=yes, 0=no)	4.65	6.91	6.96	7.43
	3.5	5.3	5.2	5.6
Person survey (1=yes, 0=no)	-2.79	-2.58	-2.64	-2.90
	-2.3	-2.2	-2.2	-2.4
Gross income (1=yes, 0=no)	2.52	1.73	1.40	1.00
	2.1	1.4	1.1	0.7
Years since 1950	-2.46	-1.76	-1.84	-1.81
	-3.5	-2.8	-2.8	-2.9
Years since 1950 squared	0.04	0.03	0.03	0.03
	3.8	3.2	3.3	3.3
Sub-Saharan Africa	17.35	8.52	8.47	9.56
	9.8	3.5	3.3	3.9
East Asia and Pacific	9.66	1.18	1.26	0.39
	6.3	0.5	0.5	0.2
South Asia	6.78	-0.70	-0.90	-2.27
	3.8	-0.3	-0.3	-0.9
Latin America and the Caribbean	15.77	5.46	5.52	4.40
	12.7	2.8	2.4	2.2
Middle East and North Africa	11.70	2.75	3.04	5.57
	4.2	0.9	1.0	1.7
Adjusted R2	0.657	0.739	0.735	0.748

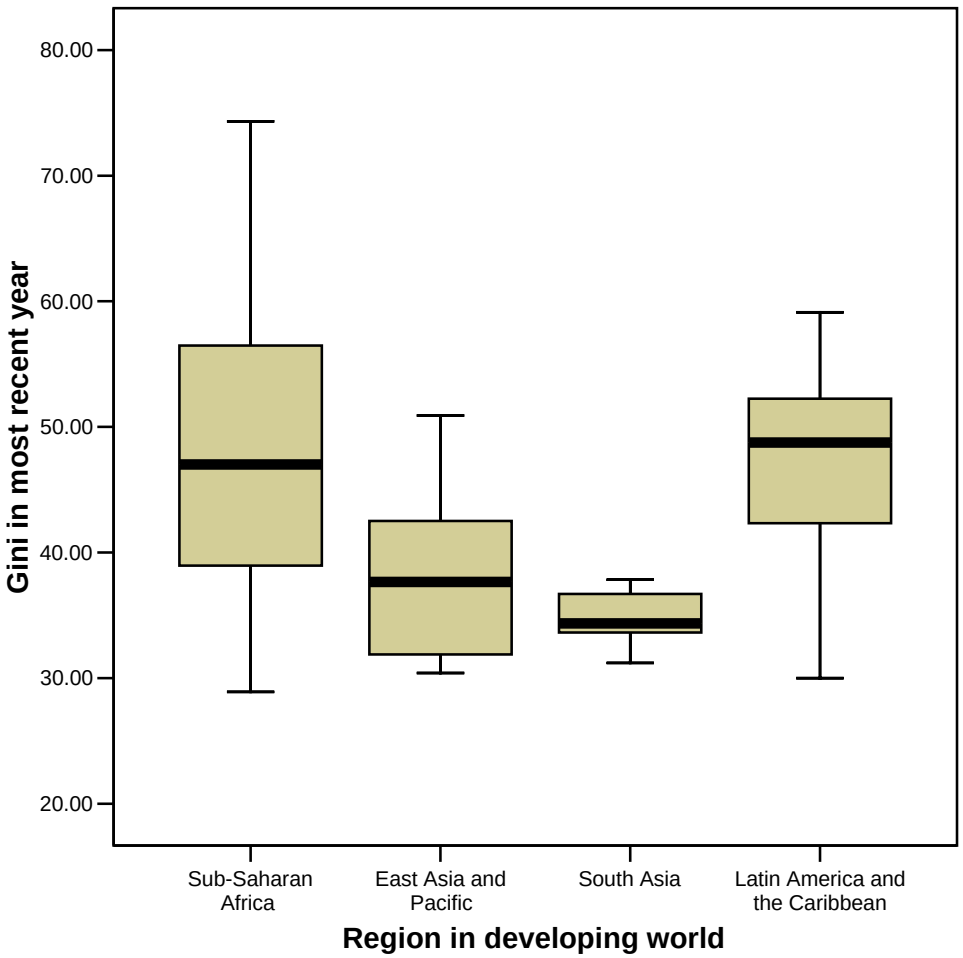
Notes: Dependent variable is the Gini coefficient. T-Statistics are shown below each coefficient.

Table 6

	1	2	3	4
(Constant)	-0.69	25.75	33.82	26.06
	-0.2	2.3	2.6	2.2
Land-labour ratio		-0.43	-0.43	-0.25
		-5.9	-2.7	-0.9
Average years of schooling		0.14	0.31	0.47
		0.4	0.9	0.5
Minerals-land ratio		-0.55	-0.87	-1.18
		-2.4	-1.7	-1.1
Trade openness			0.09	-0.07
			0.3	-0.3
Land-labour ratio*trade openness			-0.02	-0.07
			-0.1	-0.7
Capital-labour ratio*trade openness			-0.65	-0.12
			-1.2	-0.4
Minerals-land ratio*trade openness			0.41	0.22
			0.7	0.6
Latitude		0.03	0.03	0.03
		2.8	2.9	2.8
Ethnolinguistic diversity		0.09	0.09	0.06
		0.2	0.2	0.1
Civil liberties (1=highest, 7=lowest)		0.08	0.07	0.08
		0.8	0.7	0.8
Log average income (1985 US$ PPP)		-6.91	-9.08	-6.91
		-2.6	-2.9	-2.5
Per capita income squared		0.44	0.58	0.44
		2.7	3.0	2.6
Income survey (1=yes, 0=no)	-0.86	-1.32	-1.39	-1.32
	-2.7	-4.1	-4.2	-4.0
Person survey (1=yes, 0=no)	0.84	0.97	0.91	0.95
	2.9	3.4	3.1	3.2
Gross income (1=yes, 0=no)	-0.71	-0.27	-0.25	-0.32
	-2.6	-0.9	-0.8	-0.9
Years since 1950	0.53	0.46	0.47	0.45
	3.2	2.9	3.0	2.8
Years since 1950 squared	-0.01	-0.01	-0.01	-0.01
	-3.4	-3.3	-3.3	-3.1
Sub-Saharan Africa	-2.61	-1.55	-1.33	-1.47
	-6.2	-2.6	-2.1	-2.4
East Asia and Pacific	-1.17	-0.37	-0.15	-0.25
	-3.2	-0.7	-0.3	-0.4
South Asia	0.11	0.56	0.88	0.74
	0.3	0.9	1.3	1.1
Latin America and the Caribbean	-2.69	-1.08	-0.76	-1.01
	-9.1	-2.2	-1.3	-2.0
Middle East and North Africa	-1.46	-0.47	-0.20	-0.29
	-2.2	-0.6	-0.3	-0.4
Adjusted R2	0.558	0.64	0.635	0.633

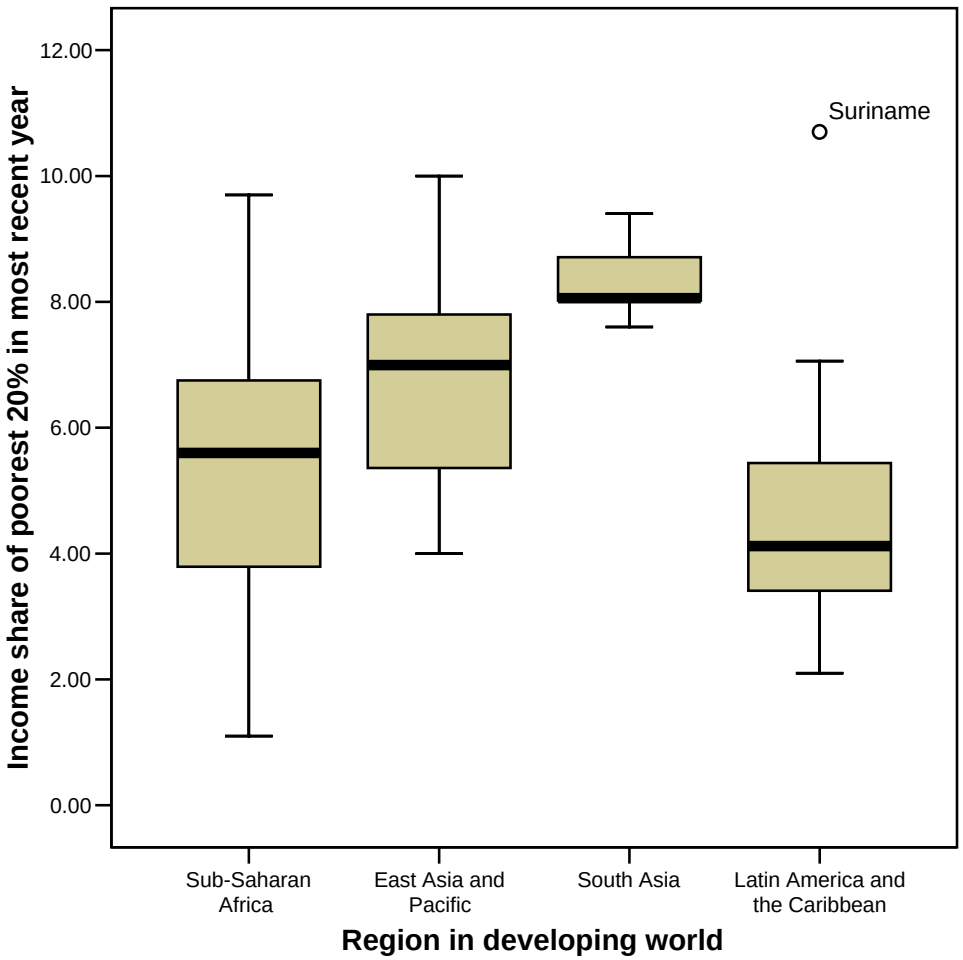
Notes: Dependent variable is the share of income received by the poorest 20%. T-Statistics are shown below each coefficient.

Figure 1



Notes: The data are taken from Dollar and Kraay (2002), who update and extend of the authoritative Deininger and Squire (1996) database. They include only 'high-quality' observations: those which are based on nationally representative surveys, which cover all aspects of households' or individuals' income or consumption. Figure 1 shows the most recent observation for each country.

Figure 2



Notes: As Figure 1.

Figure 3

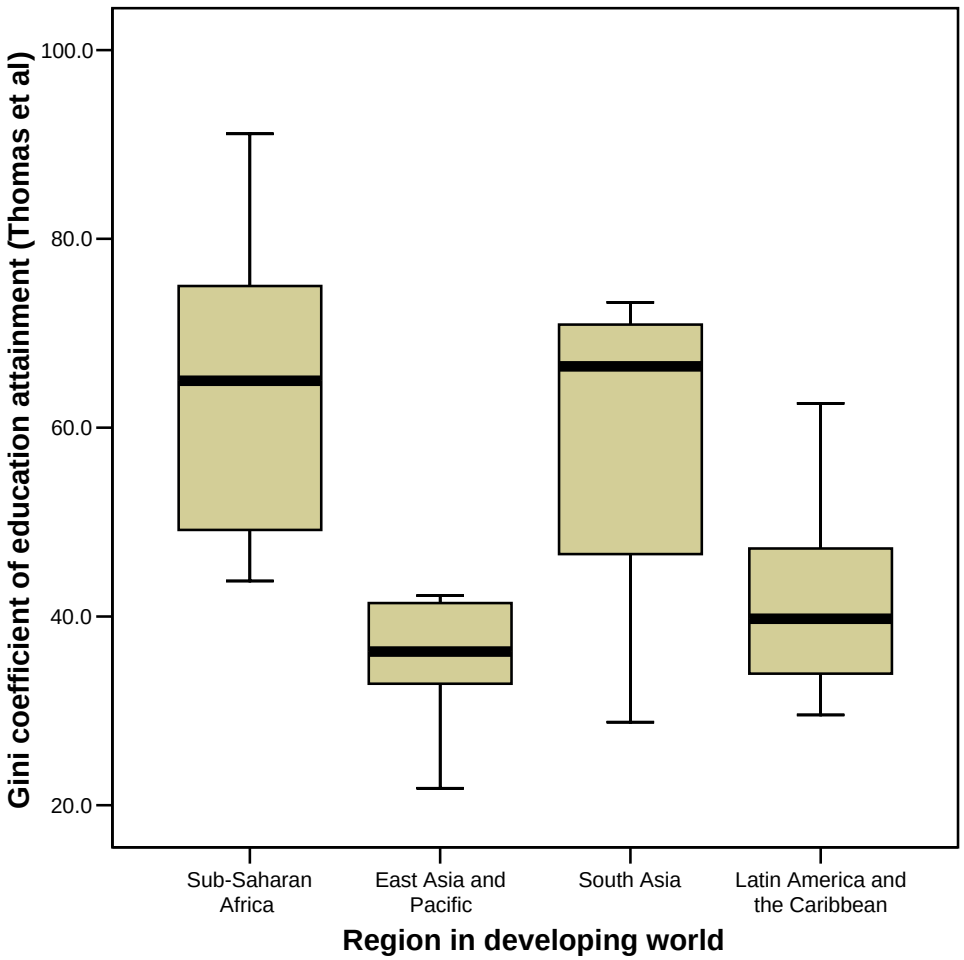
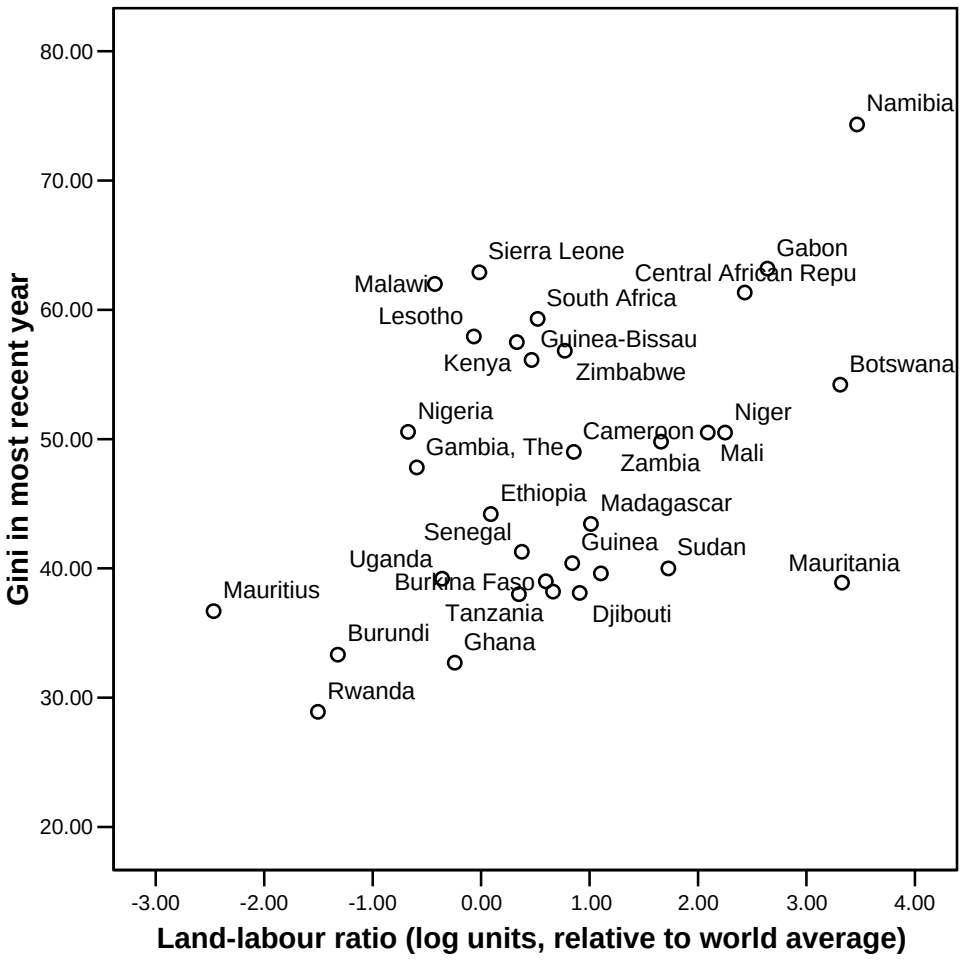
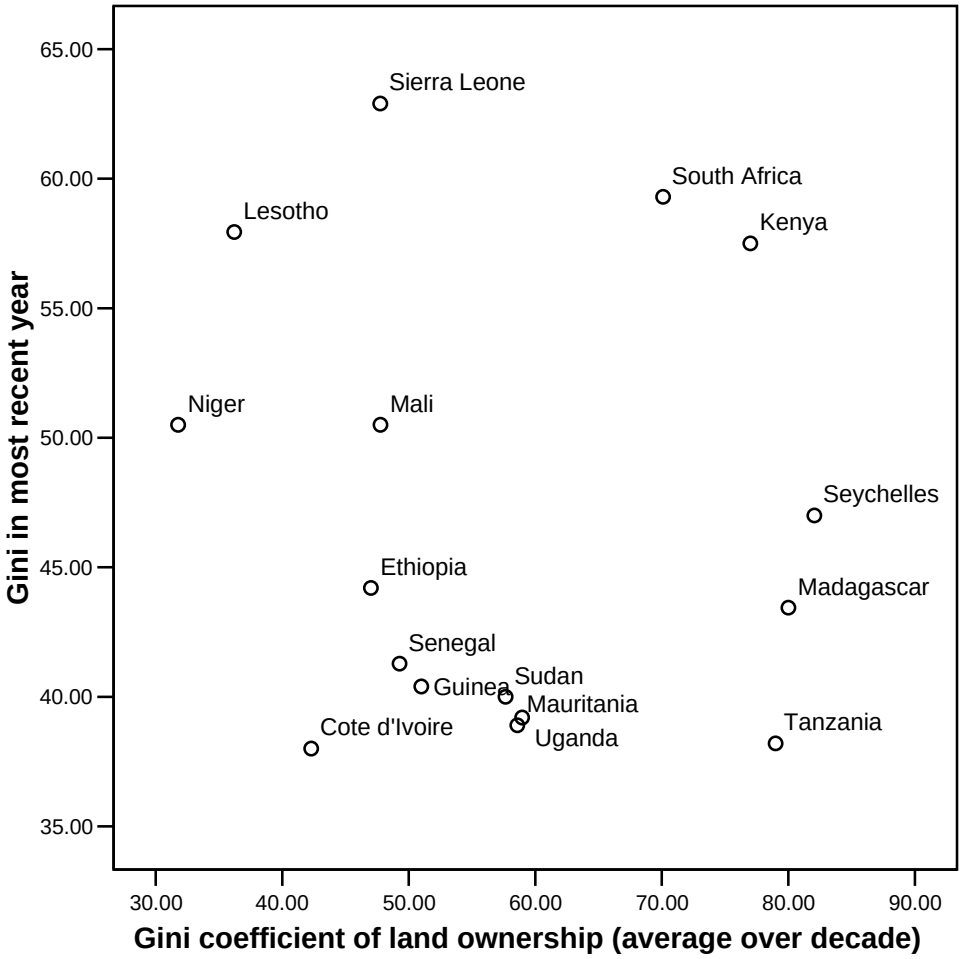

Gini coefficient of education attainment (Thomas et al)
100.0
80.0
60.0
40.0
20.0
Sub-Saharan Africa
East Asia and Pacific
South Asia
Latin America and the Caribbean
Region in developing world

Figure 4



Notes: Figure shows 33 countries in sub-Saharan Africa with data on the Gini coefficient and the land-labour ratio in the corresponding year. The linear correlation coefficient between the two variables is statistically significant at the 5% level.

Figure 5



Notes: Y-axis shows the Gini coefficient for income/consumption in most recent year (years are those in Table 1). X-axis shows the Gini coefficient for land ownership in the most recent decade prior to the observation for income/consumption inequality.

Figure 6

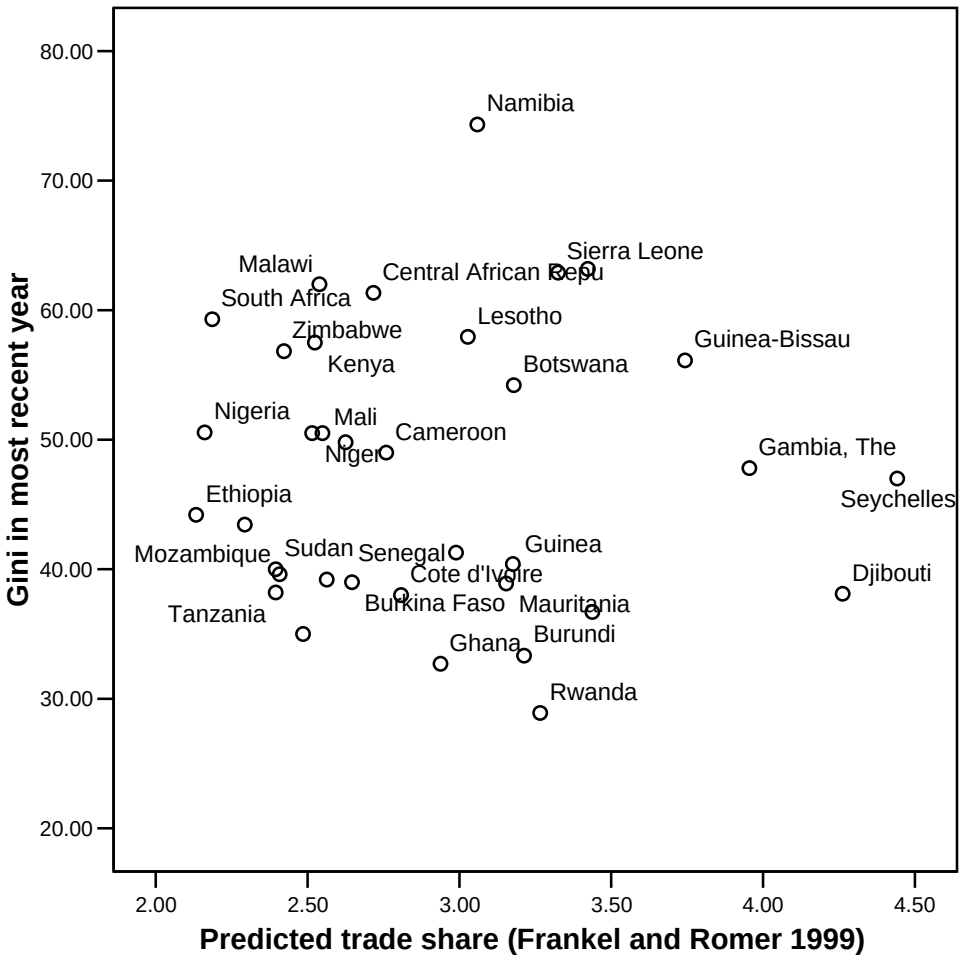

Gini in most recent year
80.00
70.00
60.00
50.00
40.00
30.00
20.00
2.00
2.50
3.00
3.50
4.00
4.50
Predicted trade share (Frankel and Romer 1999)
Namibia
Sierra Leone
Malawi
Central African Repu
South Africa
Lesotho
Zimbabwe
Guinea-Bissau
Kenya
Botswana
Nigeria
Mali
Cameroon
Niger
Gambia, The
Seychelles
Ethiopia
Mozambique
Sudan
Senegal
Guinea
Cote d'Ivoire
Djibouti
Burkina Faso
Mauritania
Tanzania
Burundi
Ghana
Rwanda

Figure 7

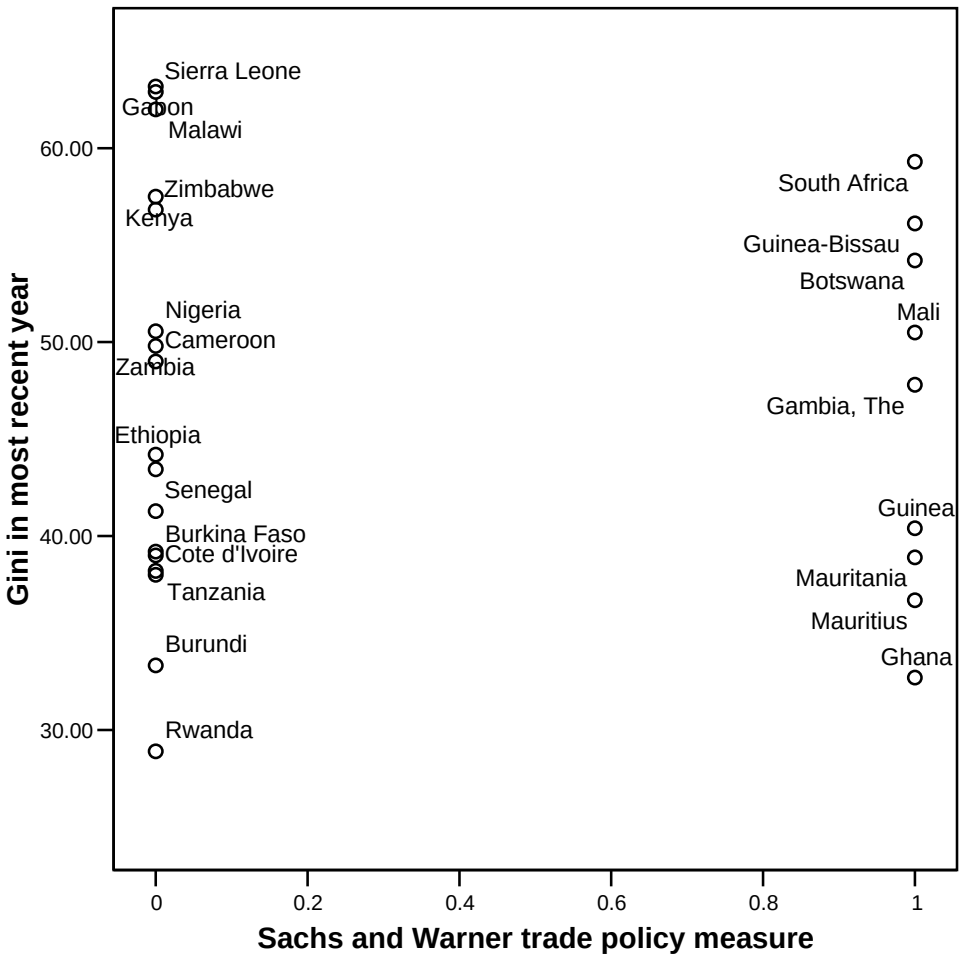

Sierra Leone
Gabon
Malawi
Zimbabwe
Kenya
Nigeria
Cameroon
Zambia
Ethiopia
Senegal
Burkina Faso
Cote d'Ivoire
Tanzania
Burundi
Rwanda
South Africa
Guinea-Bissau
Botswana
Mali
Gambia, The
Guinea
Mauritania
Mauritius
Ghana
60.00
50.00
40.00
30.00
0
0.2
0.4
0.6
0.8
1
Gini in most recent year
Sachs and Warner trade policy measure

Figure 8

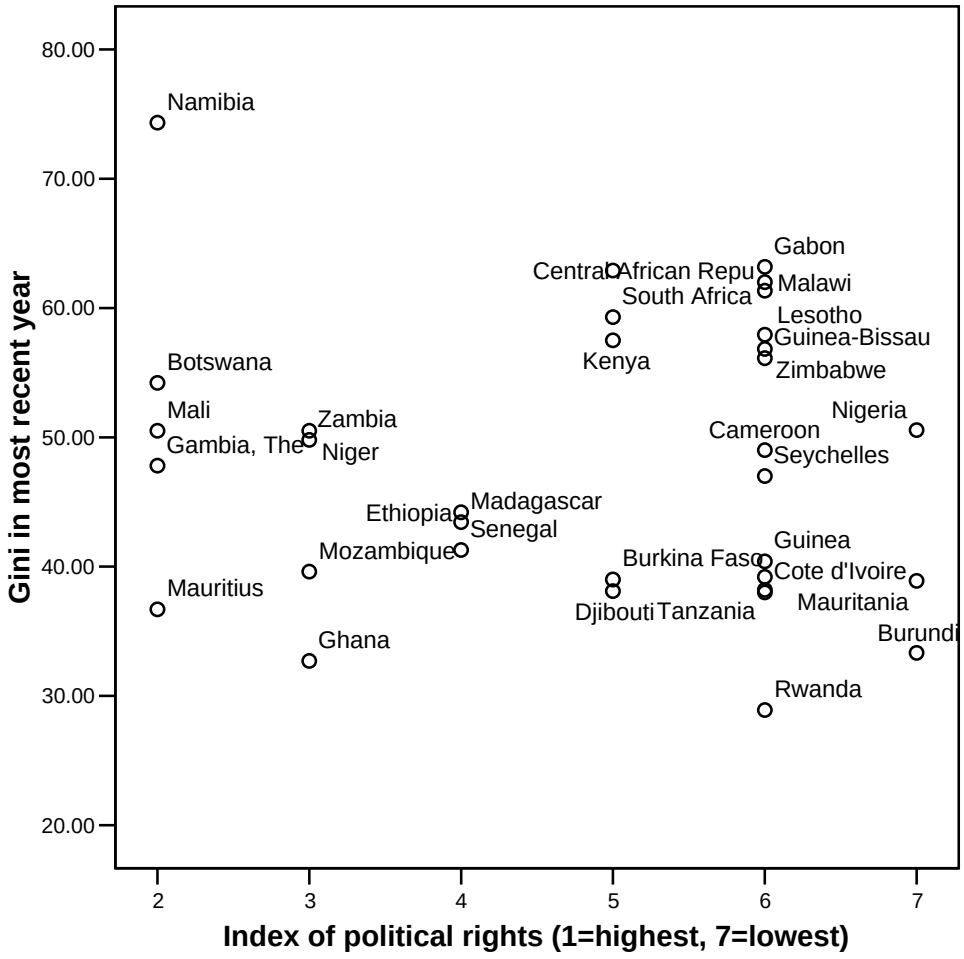
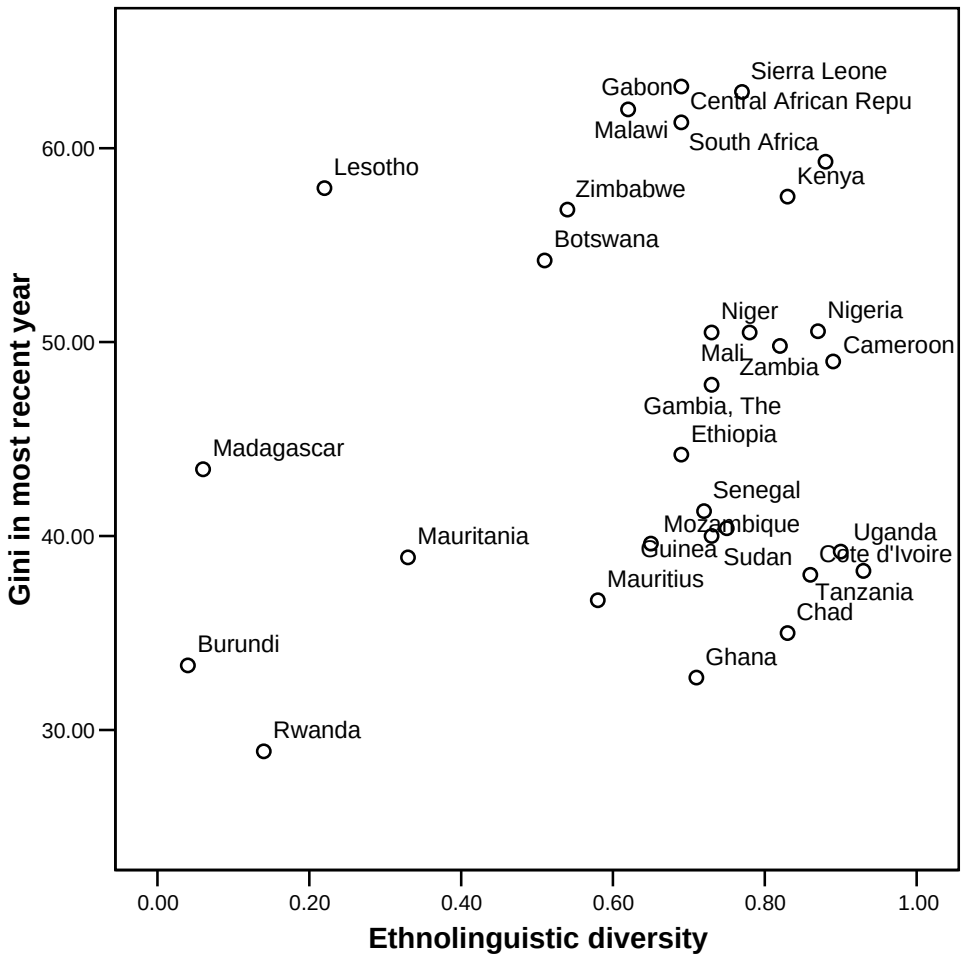
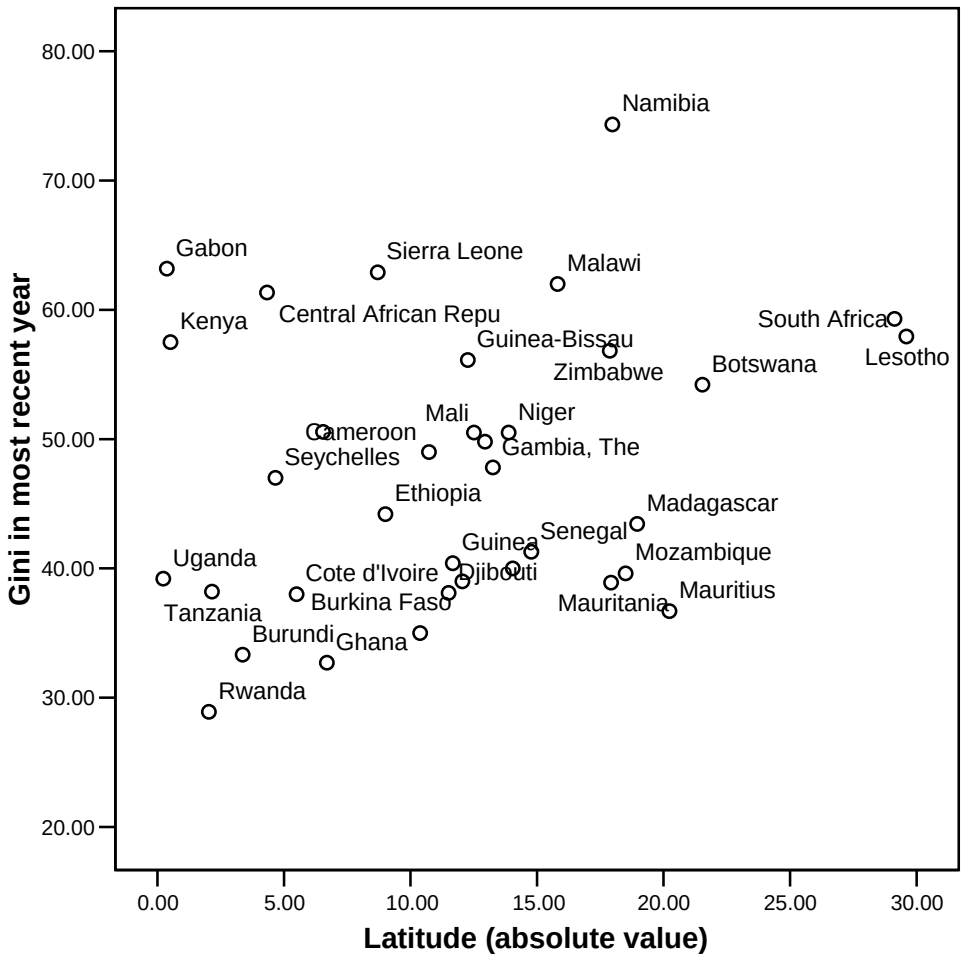

80.00
70.00
60.00
50.00
40.00
30.00
20.00
Gini in most recent year
Namibia
Botswana
Mali
Gambia, The
Zambia
Niger
Mauritius
Ghana
Mozambique
Ethiopia
Madagascar
Senegal
Central African Repu
South Africa
Kenya
Djibouti
Tanzania
Burkina Faso
Gabon
Malawi
Lesotho
Guinea-Bissau
Zimbabwe
Cameroon
Nigeria
Seychelles
Guinea
Cote d'Ivoire
Mauritania
Burundi
Rwanda
2
3
4
5
6
7
Index of political rights (1=highest, 7=lowest)

Figure 9



Notes: The linear correlation coefficient between the two variables is 0.21, but is statistically insignificant at the 10% level.

Figure 10



Notes: The linear correlation coefficient between the two variables is 0.25, and is statistically significant at the 15% level.