



Colonial Legacy and Poverty Reduction in Sub-Saharan Africa

by

Rumman Khan, Oliver Morrissey and Paul Mosley

Abstract

Although growth has improved substantially in most African countries in recent years, poverty across the continent has fallen very little in the aggregate. There have been strong poverty reduction performances in some countries, but others exhibit higher poverty rates now than in 1990 despite economic growth. This paper seeks to understand the reasons for this variance; why there are apparently 'two Africas', one with an ability to reduce poverty and one without. The main argument is that some of the reasons for this difference are rooted in colonial times. Countries with strong smallholder cash crop sectors emerged into independence with broad-based labour-intensive economies supporting a more equitable income distribution conducive to inclusive growth and poverty reduction compared to initially more inequitable mineral resource and large farm based economies. This did not necessarily determine the post-colonial path: many peasant export economies achieved no poverty reduction (often because of little growth), and some mine/plantation economies did achieve poverty reduction. The key reasons for this evolution lie in the motivation and ability of African elites to form pro-poor coalitions, which in some cases were then able to implement policies supporting a pro-poor pattern of growth.

JEL Classification: I32, O55, O13

Keywords: Poverty, sub-Saharan Africa, colonial legacy, inclusive growth



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The Authors

Rumman Khan and Oliver Morrissey are respectively Research Student and Professor of Development Economics, School of Economics, University of Nottingham. Paul Mosley is Professor of Development Economics, University of Sheffield.

Corresponding Author oliver.morrissey@nottingham.ac.uk

Acknowledgements

This paper, in particular the original motivation and country examples, have benefited from Mosley's membership of the ESID (Effective States and Inclusive Development) consortium, financed by DFID and based at the University of Manchester, and we thank ESID for its financial support. An earlier version of the paper was presented at CSAE, Oxford on 23 March 2014, and we are grateful to Luc Christiaensen, Kathleen Beegle and other participants for their comments.

1. The Issue

After decades of economic stagnation or even decline, since the late 1990s sub-Saharan Africa (SSA, or simply Africa hereafter) has recorded more than a decade of impressive growth, averaging 5-6 per cent per year (Devarajan, 2013: S9) and generating talk of 'African cheetahs' to rival the Asian tigers (Martins 2013). In terms of reducing poverty, however, achievements have been far less impressive. Poverty in SSA (at \$1.25 a day purchasing power parity) is certainly moving in the right direction, but has declined by only three percentage points, from 51% to 48%, since 1981, during a period when the developing world as a whole has more than halved poverty, from 52% to 21%.¹ For this reason, poverty in Africa will not have fallen sufficiently to meet the Millennium Development Goals, and in particular the primary target of halving of dollar-a-day poverty by 2015 (UNDP, 2014: xiii).

Country examples of successful and sustained poverty reduction in Africa are not hard to find. Ghana and Uganda have managed to halve poverty over the last twenty years (Aryeetey and McKay, 2007; Okidi *et al*, 2007) and there is evidence of long-term declines in poverty for Botswana, Burkina Faso, Cameroon, Ethiopia, Guinea, Senegal and Tanzania amongst others. With the exceptions of Ethiopia and Tanzania, however, none of these relative success cases is a large and populous country, and this is one factor reducing SSA aggregate performance; large countries such as Kenya, the Democratic Republic of Congo (DRC) and Nigeria have not significantly reduced poverty. Could it be that in terms of poverty dynamics there are two separate Africas, in one of which growth is inclusive and broad-based, hence poverty-reducing, whereas in the other it is not? This is the proposition demonstrated and explored in this paper.

There is considerable disagreement on the actual trends in poverty reduction in Africa. The most optimistic view alleges that aggregate poverty in Africa is falling faster than the official statistics indicate. Inferring poverty trends from the consumption component of GDP, as done by Pinkovskiy and Sala-i-Martin (2010), is however likely to overstate poverty reduction (McKay, 2013; Ravallion, 2000). Nevertheless, carefully analysed household surveys that are more informative on poverty trends (Deaton 2005) are also generally optimistic. McKay (2013) reviews evidence from household survey data for 25 SSA countries to demonstrate significant achievements in poverty reduction, albeit with variation across countries and at a lower rate than claimed by Pinkovskiy and Sala-i-Martin (2010). The pessimistic view argues that because national accounts data in SSA are of such low quality GDP is measured very inaccurately and poverty is probably higher than estimated (Jerven, 2013). Although the statistical difficulties are valid the inferences drawn are overstated: there is little doubt that the majority of SSA countries have experienced more than fifteen years of significant growth; there may be inaccuracies in GDP but relative levels and growth rates within SSA are likely to represent meaningful experience. The pessimistic view is also sceptical of household survey data given practical problems in, for example, defining and measuring 'the household' and informal employment (Jerven and Johnston, 2015). Such limitations, however, do not render the data uninformative and there is robust evidence of long-term poverty reduction in several countries.

Section 2 presents the argument that variations in colonial experience created some countries where growth had the potential to be inclusive, given the better opportunities for the poor because production was based on the development of labour-intensive smallholder agriculture. The prospects for inclusive growth were less in other countries whose production was based on more capital-intensive mines and plantations giving rise to narrow-based growth that excluded most of the population.

¹ During this period, poverty in East Asia fell from 61% to 13%, in South Asia from 66% to 26%, and in Latin America and the Caribbean from 12% to 6% (Olinto and Uematsu, 2013); see also Chen and Ravallion (2009).

Section 3 presents evidence for a dichotomy in poverty reduction performance that reflects the varying success of efforts to build on, or where necessary counteract, those initial conditions. Our notion of 'two Africas' is based on a distinction between a group of SSA countries that have achieved poverty reduction through inclusive growth and another group with little or no poverty reduction despite growth. The hypothesis that the colonial experience helps to explain differences in poverty reduction is tested with a parsimonious model in Section 4 (with further analysis in Appendix B). Section 5 discusses the findings and concludes.

2. A Dichotomy in Colonial Experience

The notion that there may be distinct types of African country in terms of poverty reduction performance is not new. Bowden, Chiripanhura and Mosley (2008) argued, in relation to a small sample of African countries, that the division between 'two Africas', one with a potential for inclusive development and one much less so, has its roots in colonial times, and that this has relevance to the poverty reduction strategies which have a chance of being effective today (see also Bowden and Mosley, 2012). During the late nineteenth century, two alternative strategies were used to try and make colonies economically viable (Hancock, 1943; Myint, 1976). The strategy of *settler capitalism*, allowing European settlers to appropriate agricultural land for the production of export crops (and often also mining), applied to South Africa, Zimbabwe and parts of Angola, Mozambique, DRC, Kenya and Zambia, tended to be associated with high levels of initial inequality and capital-intensity. This category is similar to what Mkandawire (2010) characterises as either labour surplus or concession company colonialism, in which the colonial power exercised considerable economic control and inequality was relatively high. The alternative, *peasant export development*, found for example in Senegal, Ghana, Sierra Leone, Nigeria, Uganda and Tanzania, provided more opportunities for Africans to develop skills and even to achieve promotion into administration. In this strategy, agricultural production was largely in the hands of indigenous African smallholders (in some cases settlers were prohibited from owning land), although marketing was controlled by the colonial government, and an infrastructure developed that was adapted to exports of smallholder crops. This is similar to what Mkandawire (2010) characterises as cash crop economies, where a relatively large informal sector developed and inequality was somewhat lower.²

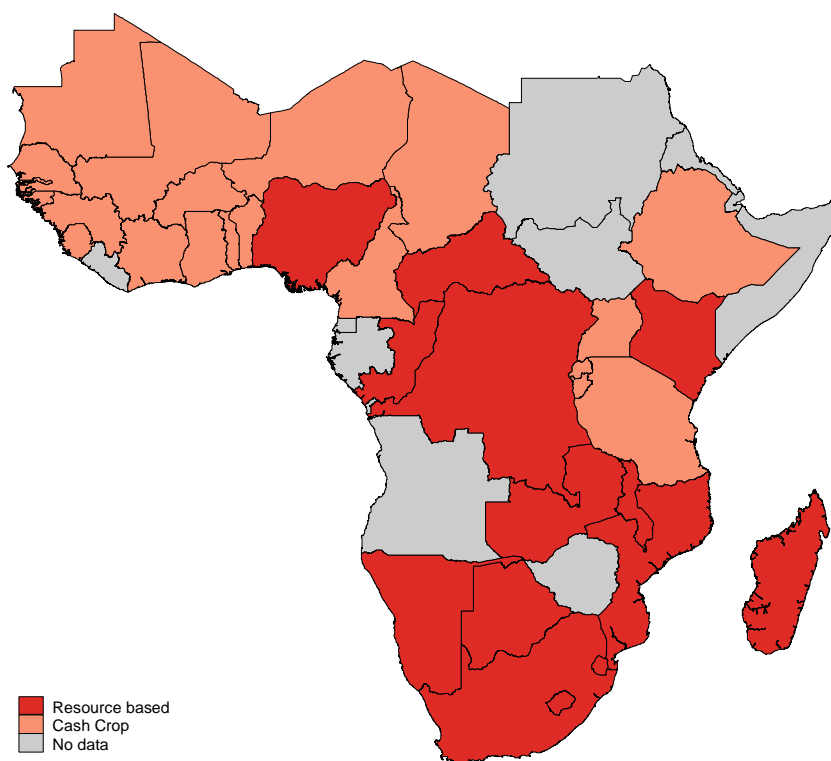
The fundamental point is that smallholder agriculture was important in its own right as a process for creating broad-based development, given relatively strong linkages with the rest of the economy, and also generated a politics in which advancement of low-income Africans was easier to achieve. Even by the late 1920s, substantial differences in infant mortality, real wages and other measures of well-being had emerged between settler economies and peasant economies (Bowden and Mosley, 2013: figure 13.2). Peasant economy status provided a legacy in the shape of a relatively equitable initial distribution of income and assets which eventually provided several African countries with a valuable platform for an inclusive development strategy. In contrast, mining and plantation-based economies were based on sectors with relatively weak linkages to the rest of the economy. This fostered a more exclusive pattern of growth and created incentives for rent-seeking and a politics that was not pro-poor.

Colonial heritage is only a broad categorization and in many countries there was no clear dichotomy. For example, when Tanganyika (now Tanzania) was in German hands from the late 19th century until World War 1 there was an influential settler community in the North keen to promote a plantation economy in conflict with a Governor who wanted to promote African smallholder production in the centre. The result was a compromise in effect if not intent (Iliffe, 1969), a hybrid economy such that Tanzania

² Note that whereas Mkandawire (2010) was concerned with the effect of this colonial heritage on the evolution of institutions that influenced the tax capacity of the state our concern is with the influence on views towards distribution.

eventually emerged as more of a peasant than a settler economy, and this was reinforced by the post-independence policies of Julius Nyerere. The classification of other countries changed over time; Ruanda-Urundi is classified by Mkandawire (2010) as among the concession company colonies but post-independence Rwanda and Burundi developed as crop-based economies. More generally, post-independence development was affected by the timing of new discoveries of mineral resources in many countries, such as oil in Nigeria. The proposed dichotomy should be viewed as a distinction between production structures and policies likely to yield inclusive or exclusive development. In some SSA countries, which will be termed *crop-based*, smallholder agriculture production of food and cash (export) crops was important and this provided a foundation for political institutions that favoured broad-based development. The other countries will be termed *resource-based*, where mining and plantation or large scale export crop production was far more important and institutions emerged to reflect this enclave style of development. Map 1 illustrates the distribution of the two types of economy.

Map 1: Country Classification



Note: Classification adapted from Mkandawire (2010) by combining labour reserve and concession companies into Resource-based and reclassifying some countries that have changed significantly since independence (Nigeria classified as Resource-based; Burundi and Rwanda as Cash-crop). 'No data' designates countries omitted from the analysis due to data limitations.

The colonial inheritance of a crop-based economy is neither a necessary nor a sufficient condition for a successful poverty-reduction strategy. Several crop-based economies, under the stress of subsequent resource discoveries, civil conflict and/or governance deficiencies, experienced failed development (especially growth) strategies after independence and had dissipated the initial potential by the 1980s, Nigeria and Côte d'Ivoire being prominent illustrations. In contrast, some resource-based economies were able to avoid the natural resource, capital-intensive trap and develop effective inclusive poverty reduction strategies; Botswana may be the best example (Poteete, 2009) but Namibia is another. We are not claiming that the nature of the colonial experience as described here is deterministic but rather that it created initial conditions that either increased the likelihood of inclusive policies emerging that were favourable to poverty reduction (the relative political and economic importance of rural, smallholder producers in crop-based economies supported broad-based politics) or made exclusive rent-seeking politics more likely (in resource-based economies where particular groups had preferential access to economic and political influence). Two factors were particularly important in determining how these initial conditions evolved: the nature of post-independence leadership and the timing of significant new resource discoveries.

The contrast between Ghana and Nigeria illustrates the impact of resource discoveries. Both originated as crop-based economies in which smallholder exports (of cocoa and palm oil) served as the mainspring of economic growth and provided the buffer of low initial inequality deriving from the wide diffusion of gains from those exports. However, from the 1950s onward after the discovery of oil, Nigeria shifted to a resource-based economy following long periods of military government and political turbulence, especially the civil war in the mid-1960s. The conventional wisdom is that in Nigeria the political system was not able to resist, and indeed amplified, the effects of the 'natural resource curse'. Nigeria's oil resources generated Dutch disease, promoted a capital-intensive pattern of production which was bad at generating new jobs, and stifled rather than encouraged smallholder agriculture where most of the poor were based (Bach, 2004; World Bank, 2013). Although oil provided the government with significant revenues for investment and spending these were not used to finance public spending on smallholder agriculture, the mainstay of most poor people's subsistence (Mogues *et al*, 2008), or investment in education. The rent-seeking induced by resource wealth ensured that growth in Nigeria has not been inclusive.³

Post-independence Ghana was politically a relatively stable country with a strong smallholder cocoa sector, even under the regimes of President Flight-Lieutenant Jerry Rawlings. It was one of the first African countries to abandon single-party, quasi-authoritarian politics in favour of genuine multi-party democracy in the 1992 elections won by the National Defence Council (NDC), the more rural-oriented and less business-oriented party, which initiated political organization of the poor with Rawlings elected as President. The focus on educational policies was a key instrument to capture the loyalty of poor voters; 'after taking power Rawlings and his ... [government] organized, and served, the poor' (Kosack, 2012: 200). Despite this political orientation towards rural areas, the decline in headcount poverty in Ghana over the course of the 1980s and 1990s largely benefited workers (including farm workers) and the self-employed and was more pronounced in urban than rural areas (Nsawah-Nuamah *et al*, 2010); the benefits were least in subsistence farming areas of the north (Porter, 2003; World Bank, 2011; Olinto and Uematsu, 2013). This may disguise the benefits for commercial farmers and cocoa smallholders who were above the poverty line by the mid-1980s. The key elements in the reform process from the

³ Ghana, since 2009, has of course become an oil exporter and there has been much anxiety about the potential distributional and political consequences of this, some of it explicitly focussed around the question of how to avoid the consequences of the Nigerian precedent. For an early discussion of the fiscal management of offshore oil in Ghana see Kopinski *et al* (2013).

1980s did benefit agriculture: tax reform and tariff reduction; liberalisation of the exchange rate regime; and privatisation of statutory marketing boards resulting in large increases in the on-farm price received by producers.

Post-independence politics were instrumental in the way in which distributional politics evolved in east Africa. Conditions were most favourable in Tanzania: ethnic divisions were not as pronounced as in other countries, in part because the widespread adoption of Swahili supported unity in nationalist and post-colonialist eras (Lonsdale, 2012: 40), and Nyerere successfully promoted an inclusive politics. Kenya, in contrast, was more ethnically divided and this was exploited by political leaders to create a divisive form of ethnic patriotism (Lonsdale, 2012). White settler interests were concentrated in the Rift Valley and in the post-independence period Kenyatta supported resettlement of Kikuyu there, forging an (ultimately fragile) alliance with Kalenjin so the ethnic groups in the leadership captured control of resources. 'The struggle to control state power has led to state-sponsored ethnicity [using] state institutions to create both class interests and ethnic domination by a system of reward and exclusion' (Ogut, 2012: 122). Political stability in Uganda only lasted until the early 1970s and it was not until 1986 that fourteen years of political turbulence and five years of guerrilla war came to an end. The victory of Yoweri Museveni and the National Resistance Movement (NRM), Uganda's only legitimate political party, permitted a 'new beginning' and initially had priorities for restoration of the rule of law, the economy and infrastructure; prior to the early 1990s poverty and poverty reduction were scarcely considered. The three key policy measures which caused poverty to almost halve between 1992 and 2000 were, as in Ghana, agricultural reform including the removal of taxes on exports (coffee and cotton – the bulk of which were produced by low-income smallholders); the prioritising of pro-poor expenditures including primary health and education, rural infrastructure and smallholder agriculture; and the pursuit of universal primary education (Mosley, 2012). An important element in the allocation of resources in Uganda has been a process of decentralization to local councils and allowing an increasing role for non-governmental organizations (Barr and Fafchamps, 2006). Advocates for the poor were incorporated into the machinery of government (through the dominant NRM party) to serve as a buttress against protest, and the whole process was reinforced by the boost to rural smallholder income provided by agricultural liberalization.

The colonial experience was rarely a determinant of distributional policy in the 1960s, although it was a factor in how post-independence politics evolved (inclusive in countries like Tanzania but divisive in countries like Kenya). In most African countries the 1970s and much of the 1980s was a period of political and economic instability and at best low growth (and high poverty). Following adjustment in the 1980s (at the instigation of donors) more stable policy regimes began to emerge in the 1990s. This is where we take up the story in the next two sections; whether the colonial legacy was converted into a durable pro-poor development strategy depended on whether a pro-poor coalition could be assembled which had the vision, the technical capacity and the motivation not only to break out of the low-income trap – which most of Africa appeared to be in by the 1970s – but also to make a dent in poverty levels through growth supported by an effective pro-poor policy framework.

Table 1: Sample Countries and Poverty Performance 1990-2013

Country	Period	Surveys	% Δ GDP pa	\$1.25 Poverty Headcount			Elasticity
				Initial	Current	% Δ pa	
Gambia	1998-2003	2	4.1	65.6	33.6	-9.75	-2.4
Congo, Rep.	2005-2011	2	5.4	54.1	32.8	-6.56	-1.2
Chad	2003-2011	2	10.1	62.0	36.5	-5.13	-0.5
Cameroon	1996-2007	3	4.0	47.4	27.6	-3.80	-0.9
South Africa	1993-2011	6	3.2	24.3	9.4	-3.40	-1.1
Swaziland	1995-2010	3	2.6	78.4	39.3	-3.33	-1.3
Namibia	1993-2010	3	3.8	49.1	23.5	-3.06	-0.8
Botswana	1986-2009	4	5.8	35.6	13.4	-2.71	-0.5
Guinea	1991-2012	5	3.3	93.7	40.9	-2.69	-0.8
Ethiopia	1995-2011	4	7.5	63.2	36.8	-2.61	-0.3
Mali	1994-2010	4	5.5	85.9	50.6	-2.57	-0.5
Burkina Faso	1994-2009	4	5.8	71.2	44.5	-2.50	-0.4
Ghana	1988-2006	5	4.7	50.6	28.6	-2.42	-0.5
Senegal	1991-2011	5	3.5	65.7	34.1	-2.41	-0.7
Niger	1992-2011	5	3.2	72.8	40.8	-2.31	-0.7
Mauritania	1987-2008	6	1.4	41.3	23.4	-2.06	-1.5
Tanzania	1992-2012	4	5.3	72.0	43.5	-1.98	-0.4
Uganda	1989-2013	8	6.8	70.8	37.8	-1.94	-0.3
Mozambique	1996-2009	3	7.7	80.6	60.7	-1.90	-0.2
C. African Rep.	1992-2008	3	2.5	83.1	62.8	-1.53	-0.6
Malawi	1998-2010	3	4.1	83.2	72.2	-1.11	-0.3
Weighted Average 'High Performers'			5.5	62.2	36.8	-2.64	-0.6
Sierra Leone	1990-2011	3	2.4	62.9	56.6	-0.47	-0.2
Togo	2006-2011	2	3.5	53.2	52.5	-0.26	-0.1
Burundi	1992-2006	3	-0.5	84.3	81.3	-0.25	0.5
Lesotho	1987-2010	5	4.1	57.2	56.2	-0.08	0.0
Rwanda	1985-2011	4	4.8	63.3	63.0	-0.01	0.0
Benin	2003-2012	2	3.7	47.3	51.6	1.00	0.3
Weighted Average 'Uncertain'			2.9	62.4	61.7	0.06	+0.1
Nigeria	1986-2010	5	4.7	54.1	62.0	0.62	0.1
Kenya	1992-2005	4	2.5	38.4	43.4	0.99	0.4
Zambia	1991-2010	8	4.6	61.1	74.3	1.14	0.2
Guinea-Bissau	1991-2002	3	1.1	41.3	48.9	1.67	1.5
Madagascar	1993-2010	6	2.8	67.1	87.7	1.81	0.6
Côte d'Ivoire	1985-2008	9	1.7	8.1	35.0	14.51	8.7
Weighted Average 'Deteriorating'			4.0	49.5	59.7	1.84	+0.9

Notes: Countries classified as crop-based are shaded in grey; others are resource-based. Period refers to the years between the first (initial) and final (current) poverty observation; Surveys is number during the period; '% Δ GDPpa' (GDP growth in % annual average) and poverty '% Δ pa' (change poverty % annual average) are calculated over this period; poverty elasticity is % Δ poverty/% Δ GDP (Burundi not signed)

because growth and poverty declined). The 'High Performers' reduced poverty; poverty increased in the 'deteriorating' countries; others are classified as 'uncertain' because there are only a couple of recent observations or inference depends on the period or poverty measure chosen (see Appendix Table A2); means are weighted by population.

Source: World Bank, POVCAL database; see Appendix Table A1.

3 The Statistical Evidence

Alternative ways of measuring poverty give rise to alternative estimates. South Africa is perhaps an extreme example where apparently the same source, national surveys, can give very different estimates of levels and trends in poverty.⁴ Our main analysis uses the World Bank Povcal \$1.25 a day measure as that covers the most countries for the longest period using standardized poverty lines (data sources and definitions are in Appendix Table A1). Poverty estimates and trends using the more recent \$1.90 poverty lines are presented in Appendix Table A2. In countries which have experienced periods of conflict data are often missing and the period of measurement is crucial; Rwanda has reduced poverty dramatically since 1996 but the devastating effect of the 1994 genocide means that on the World Bank's Povcal measure poverty was at the same level in 2011 as it had been in 1986 (national poverty line poverty fell much more significantly in the 2000s and suggests a better performance).

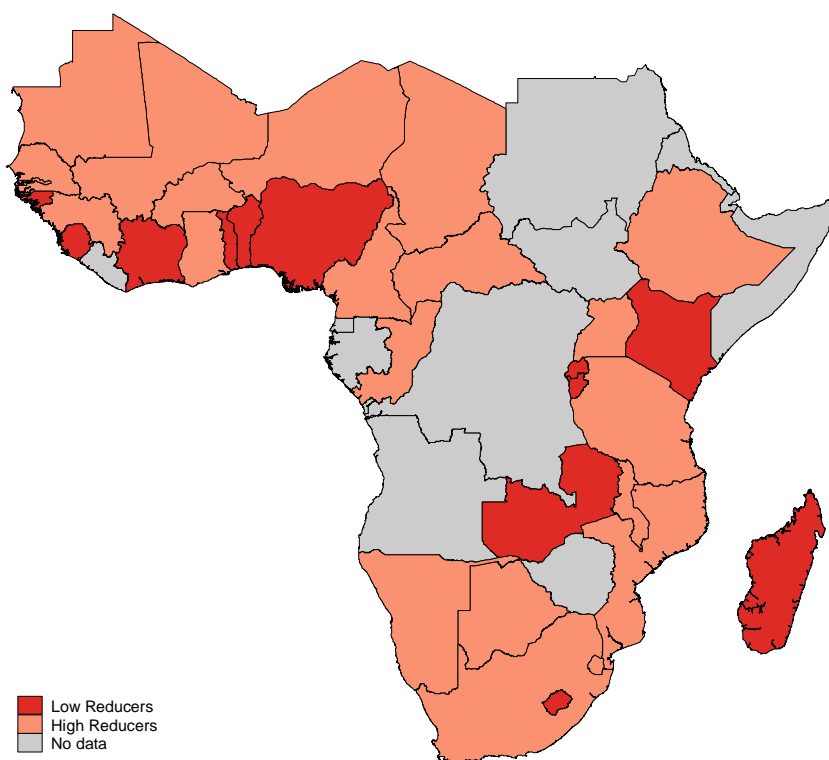
Tanzania is a good example of a country where alternative data sources provide differing evidence. The \$1.25 a day POVCAL data suggests that poverty fell from a headcount of 72% in 1992 to about 44% in 2012, implying that poverty fell by almost 40 per cent over some 20 years. The national poverty line derived from the Tanzania Household Budget Surveys suggests much lower levels and declines in consumption poverty: over the same 20 years poverty fell by only 27 per cent, from 38.6% in 1991/92 to 28.2% in 2011/12. Arndt *et al* (2015) show that differences in the price deflator used (and of course the purchasing power parity conversion) explain much of the difference between consumption poverty rates derived from national survey data compared to POVCAL estimates. The major reason why growth since 2000 did not translate into commensurate poverty reduction was the lack of growth in real household consumption; the relatively high GDP growth since 2000 was in components other than private consumption, in particular the mining sector (Arndt *et al*, 2015: 4). Although the main results are based on the internationally comparable POVCAL data, we also report results using national poverty lines.

Table 1 reports poverty trends at the \$1.25 poverty line between the first survey closest to 1990 and the most recent survey for 33 African countries; 21 appear to have sustained reductions in poverty of at least 1% per annum on average (although in some cases over only a short recent period); six experienced increasing poverty and for another six the change was negligible or data are ambiguous (e.g. trend varies by poverty line used). In general, countries with higher growth reduced poverty by more (Dollar and Kraay, 2002) but this was not consistently the case. The poverty elasticity of growth is variable: for the high performers (who reduced poverty) it is generally between -0.2 and -0.8, but -1.0 or better for six countries; in six countries (deteriorating) poverty increased - Côte d'Ivoire (3.2) and Guinea-Bissau (1.5) have the highest (adverse) values. The majority of high performers (13/21) are classed as

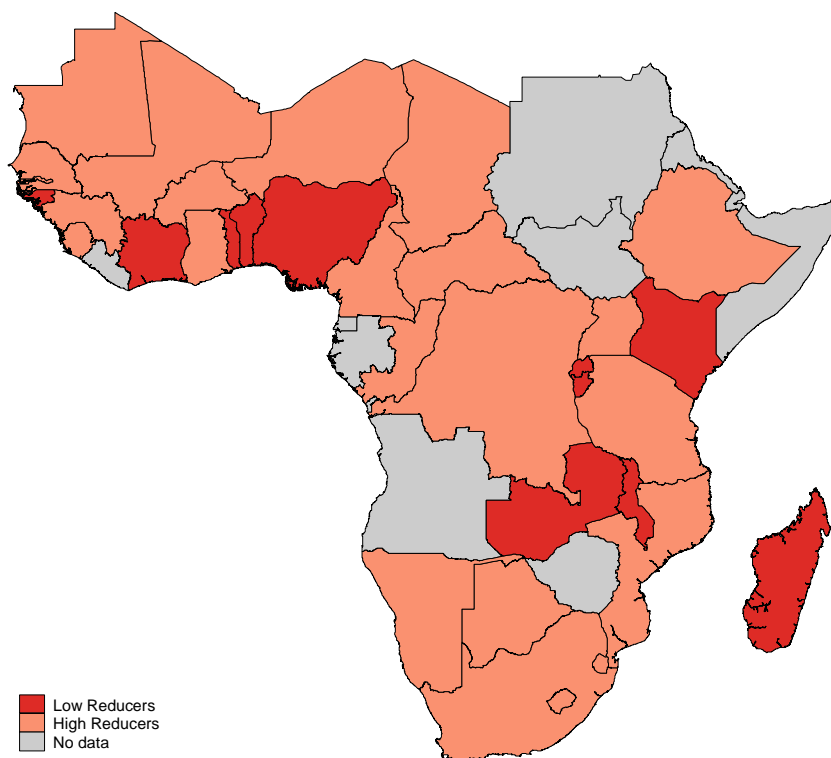
⁴ South Africa has multiple and often conflicting sources of data on poverty (Mosley, 2013, Appendix part (iii)). Leibbrandt *et al* (2010: tables 2.10 and 2.11) suggest that between 1993 and 2008 poverty declined very slightly from 56% to 54%, although it increased within the Coloured population. World Bank Povcal data suggests a much greater reduction and much lower level (Table A2), whereas national poverty line data suggest increasing poverty (Table A8). The World Bank POVCAL measure using a \$1.25 per day poverty line gives a modest central estimate of the change in headcount poverty from 24% to 16%.

crop-based (as are most uncertain countries) and the majority deteriorating are classed as resource-based. Map 2 distinguishes those countries that have sustained reductions in poverty since 1990 (high reducers) and those that have not (low reducers, uncertain or deteriorating) for the \$1.25 measure and illustrates the tendency for the crop-based countries to perform better than resource-based economies. Map 3 presents similar results for \$1.90 poverty (Appendix Table A2); the only changes are that Sierra Leone and Lesotho become high reducers whereas Malawi becomes a low reducer (uncertain).

Map 2: Country \$1.25 per day Poverty Performance



Note: 'High Reducers' are countries in which poverty clearly decreased (High Performers in Table 1); 'Low Reducers' either had small reductions but conflicting data (Uncertain in Table 1) or poverty increased (Deteriorating in Table 1). 'No data' designates countries omitted from the analysis due to data limitations.

Map 3: Country \$1.90 per day Poverty Performance

Note: As for Map 2.

The countries that reduced poverty (high performers) on average had higher initial poverty and higher annual average growth than the countries in which poverty increased (deteriorating) and achieved more significant reductions with a better elasticity (Table A3). The countries classed as uncertain were not statistically different from improvers in terms of initial \$1.25 poverty but experienced significantly lower growth and poverty reduction; whereas they initially had higher poverty than deteriorating countries there was no statistical difference in growth and they outperformed in terms of reducing poverty (only a weakly significant difference). High reducers statistically outperformed low reducers (uncertain and deteriorating) in terms of growth, poverty reduction and elasticity whether using \$1.25 (Table A3) or \$1.90 (Table A4) poverty.

Table 2 provides summary data on poverty reduction in SSA since 1990 (mostly in the 2000s). Panel A covers all countries with data in any period (full sample) and the set of 26 countries for which we have observations close to the years 1990, 2000 and 2010. Panel B splits the set of 26 countries into countries who were able to significantly reduce poverty to almost half the 1990 level by 2010 (high performers) and those that were not (low performers). This gives a more nuanced picture of poverty reduction performance in SSA than the aggregate statistics in Panel A. One

can now explicitly see the 'two Africas' phenomenon that this paper is highlighting: two groups of countries start off with similar levels of poverty (albeit higher in the high performers) but then fall into two divergent paths in reducing poverty over the next two decades. The divergence starts to take shape in the 1990s with high performers reducing poverty by almost eight percentage points whereas the low performers saw an average increase in poverty of four percentage points. Over the 2000s, the high performers were able to accelerate the pace of poverty reduction and reduce average poverty levels by a further 17 percentage points whereas the low performers had a further slight increase in poverty. Note also that for both groups the standard deviation declined over time. Thus by 2010 high performers not only managed to almost halve average poverty from the levels seen in 1990 but also had almost half the level of poverty of the low performers. This divergence is further highlighted by the fact that the high performers initially contained the country with the highest level of poverty in 1990 but by 2010 the highest rate of poverty amongst the high performers was only just above the average poverty rate among low performers. In general the low performers are more populous as the nine countries accounted for about one third of total SSA population, whereas the 17 high performers accounted for just below 43% of SSA population.

Table 2 Population Weighted \$1.25-a-day Headcount Poverty

Panel A	Full Sample			Consistent set of 26 Countries		
	1990	2000	2010	1990	2000	2010
<i>Mean</i>	58.0	56.1	48.9	58.0	55.6	46.6
<i>Std. Dev.</i>	17.5	18.1	21	17.6	18.3	18.1
<i>Min</i>	18.8	21.2	6.1	18.8	21.2	11.5
<i>Max</i>	93.7	86.4	87.7	93.7	86.4	87.7
<i>N</i>	27	32	36	26	26	26
<i>Population</i>	383.2	533.3	819.6	382.2	501.1	650.1
<i>% SSA</i>	75.5	80.3	94.8	75.3	75.4	75.2

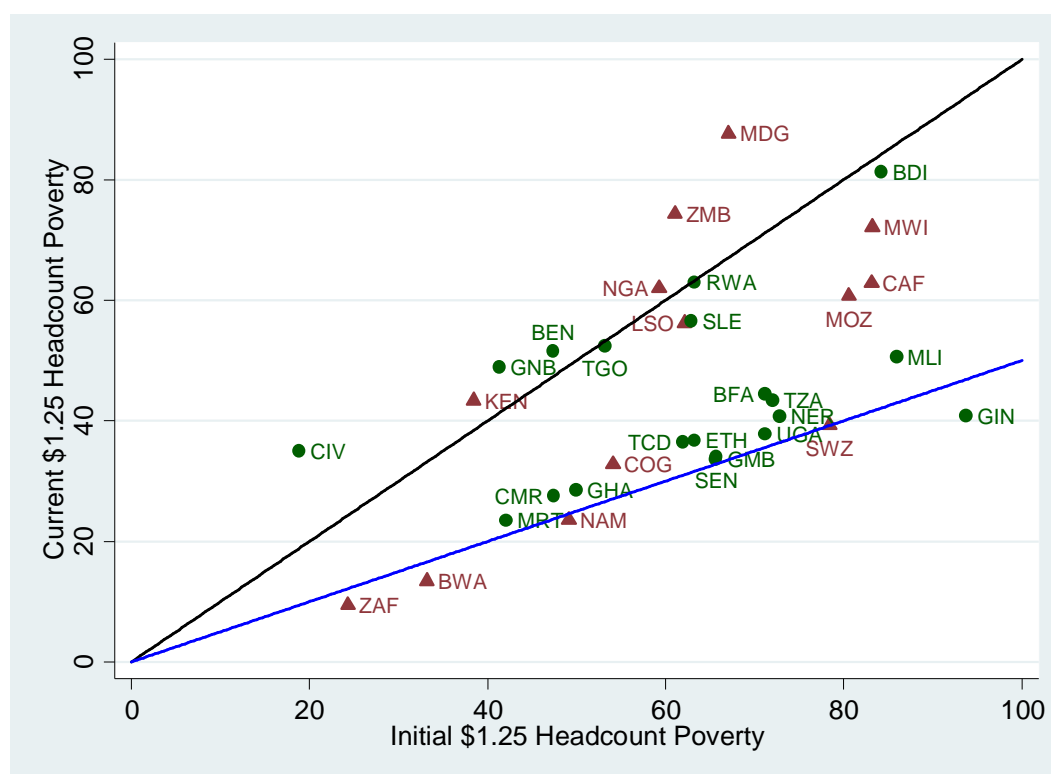
Panel B	Low Performers			High Performers		
	1990	2000	2010	1990	2000	2010
<i>Mean</i>	55.4	59.5	60.6	60.1	52.6	35.8
<i>Std. Dev.</i>	14.7	17.1	13.7	19.8	19.3	13.2
<i>Min</i>	18.8	29.9	35.0	24.3	21.2	11.5
<i>Max</i>	84.3	86.4	87.7	93.7	84.2	62.8
<i>N</i>	9	9	9	17	17	17
<i>Population</i>	169.0	217.2	281.7	213.2	283.9	368.4
<i>% SSA</i>	33.3	32.7	32.6	42.0	42.7	42.6

Notes: High Performers as for Table 1, Low Performers combines Uncertain and Deteriorating from Table 1; poverty averages based on surveys closest to the indicated year; *N* is number of countries in the particular sample; *Population* is sum of the *N* countries; *% SSA* is sample as a percentage of total SSA population.

This distinction between the 'two Africas' is illustrated in Figure 1. The 45° line indicates countries that have not reduced poverty (in any countries above the 45° line, poverty increased) while the lower line represents countries that have reduced poverty by about half since the earliest and most recent survey observation. Crop-based countries are more likely to be clustered around the lower line; the main exceptions are crop-based countries that were initially small and poor (such as Benin and Togo)

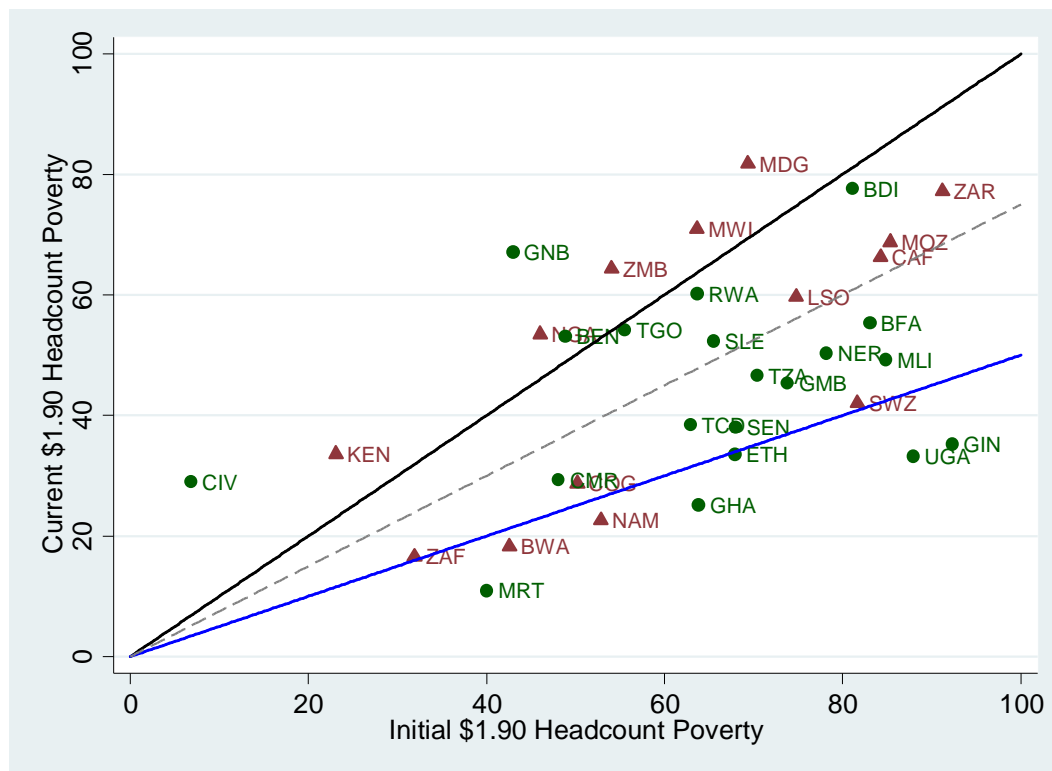
and/or experienced significant instability (Burundi, Rwanda and Sierra Leone). In contrast, resource-based economies tend to be around the upper line; the exceptions are in Southern Africa (Botswana, Namibia, South Africa and Swaziland) and had relatively good institutions. Obviously, there is a wide dispersion around both lines and it would be misleading to claim a high correlation (the analysis in the next section shows that the differences are significant). The figure also highlights another interesting difference between crop- and resource-based economies in terms of initial poverty. The poverty reduction of resource-based economies appears to be dependent on initial poverty levels: countries with initially low poverty levels were able to further reduce poverty by about a half, whereas those with high initial poverty (above a 40% headcount) struggled to reduce poverty (with the exception of Swaziland) or even saw an increase. For crop-based economies initial poverty levels do not appear to affect subsequent poverty reduction performance. Figure 2 presents comparable information for the \$1.90 poverty line (the dotted line represents a 25% reduction in poverty): although the countries are more spread out the broad pattern is the same.

Figure 1: \$1.25 Poverty Performance over Period (1990-2013 or most recent observation)



Notes: Countries designated ● are classified as crop-based whereas those designated ▲ are resource-based. The upper (45°) line is no change in poverty, the lower line indicates a 50% reduction between the first and last survey measure. The basic pattern is unaltered if countries with very low data coverage are excluded. A comparable pattern is found using \$2 a day poverty and reduction by 25%.

Figure 2: \$1.90 Poverty Performance over Period (1990-2013 or most recent observation)



Notes: Countries designated ● are classified as crop-based whereas those designated Δ are resource-based (raw data in Table A2). The upper (45°) line is no change in poverty, the lower line indicates a 50% reduction between the first and last survey measure. The dotted line is poverty reduction by 25%.

Table 3 gives further evidence on the relation between colonial heritage and poverty reduction. Most of the poverty reduction since 1990 has come from crop-based countries and this is more pronounced for the full sample (Panel B) compared to the 26 country sample (Panel A). The table also highlights differing trends within crop-based and resource-based economies. Not only is poverty falling on average in crop-based economies but poverty levels are also converging over time as shown by the declining range and standard deviation, particularly the unweighted standard deviation which better captures variation between countries. On the other hand, resource-based economies are characterised by average poverty falling little and poverty levels across countries diverging over time, a trend noticeable in Figure 1. Although crop-based economies experienced much larger poverty reduction over the period they also started off with higher initial poverty and by 2010 had obtained levels below resource-based economies. Panel B, which contains the full sample of countries, suggests poverty levels for resource-based economies are under-reported in the restricted sample as some of the poorest and most populous countries are excluded. Using the full sample for 2010 one can see that poverty levels are significantly lower in crop-based countries compared to resource-based.

Table 3 \$1.25 Poverty in Crop-based vs Resource-based Countries

Panel A	Crop-based countries			Resource-based countries		
	26 countries	1990	2000	2010	1990	2000
<i>Mean</i>	64.6 (63.6)	54.9 (56.4)	43.1 (40.2)	57.9 (52.7)	50.3 (54.9)	48.6 (53.1)
<i>Std. Dev.</i>	19.0 (16.4)	20.1 (18.1)	15.2 (10.8)	19.7 (17.6)	19.7 (19.3)	24.8 (22.1)
<i>Min</i>	18.8	21.2	23.4	24.3	24.4	11.5
<i>Max</i>	93.7	86.4	81.3	83.1	79.4	87.7
<i>N</i>	15	15	15	11	11	11
<i>Pop</i>	186.8	248.6	328.6	195.4	252.5	321.5
<i>% SSA</i>	36.8	37.5	38.0	38.5	38.0	37.2

Panel B	Crop-based			Resource-based		
	Full sample	1990	2000	2010	1990	2000
<i>Mean</i>	63.5	56.3	39.1	52.7	56.0	58.0
<i>Std. Dev.</i>	16.4	17.5	12.6	17.6	19.4	23.5
<i>Min</i>	18.8	21.2	19.8	24.3	24.4	6.1
<i>Max</i>	93.7	86.4	83.7	83.1	80.5	87.7
<i>N</i>	16	19	20	11	13	16
<i>Pop</i>	187.8	266.3	395.7	195.4	266.9	423.9
<i>% SSA</i>	37.0	40.1	45.8	38.5	40.2	49.0

Notes: As for Table 2. Panel A is for the 26 countries with data within 5 years either side of 1990, 2000 and 2010; unweighted values listed first with population weighted poverty in parentheses. Panel B is for any country with data for the year, population weighted.

Table 4 separates crop- and resource-based countries by their poverty reduction performance. Almost two-thirds of crop-based countries are high performers but this is over 80% in terms of the share of the crop-based population; although a similar share of resource-based countries are also high performers they account for less than a third of the population of resource-based countries. It is also the case that the majority of high performers are crop economies. Most resource-based countries are low performers (especially by population share); although under half the number of low performers, resource countries account for 80% of the total population of low performers. High-performer resource countries are small in terms of population with the exception of South Africa, which accounts for the 51 of the 104 million individuals residing in such countries. Given the problems with South African poverty data (see above) it could be treated as uncertain hence classed as a low performer, in which case the clear majority of people living in resource economies would be in a low performer. We can also note that expenditure on pro-poor sectors⁵ as a share of GDP (PPE hereafter) tends to be higher (and highest for high performers in the full sample) in resource economies; surprisingly perhaps, PPE is lowest on average for high performer crop economies. We return to this in the next section which provides statistical tests for the two Africas.

⁵ Here defined as expenditure on health and education (see Appendix Table A1); note that Gomanee *et al* (2005) also included expenditure on sanitation (including water).

Table 4 \$1.25 Poverty Performance and PPE

Panel A (unweighted)	N	2010 Pop	\$1.25 1990		\$1.25 2010		PPE	
			Mean (SD)	N	Mean (SD)	N	Mean (SD)	N
Crop-based Low Performer	7	62	55.2 (25.5)	5	57.0 (15.4)	6	6.7 (1.2)	7
Resource Low Performer	5	237	57.6 (11.1)	5	64.7 (17.0)	5	8.9 (5.4)	4
Resource High Performer	8	104	58.1 (26.0)	6	39.6 (23.4)	8	8.6 (3.2)	8
Crop-based High Performer	13	297	66.8 (15.7)	11	37.1 (7.8)	12	5.9 (1.6)	13
Total	33	700	61.0 (19.2)	27	46.0 (18.8)	31	7.1 (2.9)	32

Panel B (weighted)	N	2010 Pop	\$1.25 1990		\$1.25 2010		PPE	
			Mean (SD)	N	Mean (SD)	N	Mean (SD)	N
Crop-based Low Performer	7	62	49.7 (30.0)	5	53.9 (17.3)	6	6.7 (1.4)	7
Resource Low Performer	5	237	56.6 (9.4)	5	61.7 (12.6)	5	7.1 (2.4)	4
Resource High Performer	8	104	42.9 (28.5)	6	35.3 (27.6)	8	8.4 (1.7)	8
Crop-based High Performer	13	297	66.1 (11.6)	11	37.9 (6.0)	12	6.3 (1.4)	13
Total	33	700	58.0 (17.5)	27	47.0 (18.0)	31	6.9 (1.7)	32

Notes: As for Table 2; PPE is pro-poor expenditure as a share of GDP (overall average). Panel A not weighted by population, Panel B is. Standard deviations declined over the period (not reported). Sample size varies (no PPE data for Nigeria).

4 Empirical Testing and Validation

Acknowledging the limited quality of the data and given that there are only a few poverty observations for each country, a parsimonious approach is adopted for the econometric analysis: the aim is not to explain variation in poverty or poverty reduction but to test if crop economies do out-perform resource economies. The analysis is based on the World Bank's \$1.25 a day measure because it provides the largest sample with consistent measurement. As a robustness check, estimates are also provided for the \$1.90 a day measure and for a smaller sample using national poverty lines. One particular problem with poverty analysis is that the poorest people produce only for subsistence and have little or no contact with the market economy, whereas it is in relation to the subsistence economy that the estimates of national statistical agencies tend to be most inaccurate. This is why many researchers favour the use of household surveys (which do capture subsistence producers and those engaged in informal sectors) over national accounts. Unfortunately, nationally representative household consumption surveys are conducted at best every four or

five years and often much less frequently, so even if the sample includes many countries the number of observations (surveys) per country is often quite low. The problem is very much an African one: whereas developing countries have an average of 3.9 estimates of poverty since 2001, African countries have 1.7 (Devarajan, 2013: 59).

In addition to initial poverty and the crop/resource distinction, the core explanatory variables included are growth (a measure of potential to reduce poverty), inequality (to capture political willingness) and pro-poor public expenditure (PPE, to capture policy effort). Although there is acceptance that growth provides the potential for poverty reduction and one expects a significant coefficient, it is clear from Table 1 that the elasticity varies significantly. An important factor determining the relationship between growth and poverty reduction is inequality, the distribution of income as measured by the Gini coefficient. That income distribution influences the possibilities for poverty reduction is almost tautologically true, as an increase in the well-being of the poor in relation to the well-being of other income groups automatically makes the distribution of income more equal and reduces the Gini coefficient of inequality. There are plausible reasons why a reduction in inequality might be expected to reduce poverty, including the ability of lower levels of inequality to boost the level of domestic demand and thence production, and the likelihood that lower levels of vertical and horizontal inequality will reduce the likelihood of conflict and thus provide a boost to growth (Mosley, 2012).

Variations in inequality are not an adequate explanation of variations in poverty trajectories. First, there are many cases where poverty goes down over time even though inequality increases as the private 'capitalist sector', in which levels of private enterprise but also inequality are high, expands at the expense of the 'subsistence sector' (there is some evidence for this in Uganda). Furthermore, simply knowing that inequality matters does not provide us with a pathway explaining how inequality, and thereby poverty, can be reduced in practical terms without prejudicing growth, and such a pathway is what is required by, in particular, those African countries which have not yet been successful in reducing poverty. Fosu (2014) argues that poverty reduction in SSA has been very heterogeneous and seeks to explain that by separating the contribution of growth from that of reductions in inequality for 23 SSA countries and finds that rising inequality contributed in those countries where poverty increased (Guinea-Bissau is the exception where inequality fell) whilst in seven of the 18 countries that reduced poverty changes in inequality limited the reduction. Overall it seems that 'declining inequality tended to decrease poverty (though not necessarily in very low income countries) [while] lower initial inequality raised the rate at which growth was transformed to poverty reduction' (Fosu, 2014: 13).

The important issue may be how rather than whether inequality is reduced, i.e. which groups benefit. As observed in section 2, the key economic reforms in countries such as Ghana and Uganda that reduced poverty were of benefit to agriculture, the sector on which most of the population relied for their livelihood (directly or indirectly). Furthermore, these reforms were initiated by donors and most successfully implemented through poverty reduction strategies in countries that had built a relationship of trust with the aid donors. As donors emphasised the role of social sector spending in poverty reduction, we choose pro-poor public expenditure (PPE, as a share of GDP) as an indicator of the poverty orientation of policy (Gomanee *et al*, 2005). Given inequality and growth, higher PPE implies that the poor are more likely to benefit.

The basic specification in general terms is:

$$P_{it} = P(P_0, g, Gini, \text{Crop/Resource}, PPE, [Z]) \quad (1)$$

Poverty in country i in period t (the year of a survey observation) is posited to depend on: P_0 , initial poverty (the first observation); g (average per annum GDP growth since the previous survey); the Gini measure of inequality (in the year of a survey

observation); *Crop* (=1 if crop-based and 0 if resource-based) and PPE (averaged over the entire period). A set of additional controls (*Z*) are added, including fuel exports as a share of GDP, measures of democracy, and a post-conflict dummy. The variable of specific interest, *Crop*, acts as an indicator of 'history' (whether the country inherited an inclusive economic structure or otherwise); the controls act as indicators of vulnerability and resilience to shocks (5-year time dummies are also included); while Gini and PPE capture ability to deliver pro-poor policy. Pro-poor public expenditure is the ratio of sector expenditure on health, education and social expenditures (excluding housing) to total expenditure, the logic of this being that these are the sectors which have the greatest ability to reduce poverty both by augmenting the human capital of the poor, by providing livelihoods to them and by reducing the cost of the goods which they consume (Gomanee *et al*, 2005). The results presented here are estimated with OLS; Appendix B presents sensitivity analysis with alternative estimators (see below).

Table 5 Determinants of Poverty Performance (full sample, \$1.25 weighted)

	(1)	(2)	(3)	(4)	(5)
<i>P0</i>	0.810*** (0.088)	0.688*** (0.083)	0.640*** (0.081)	0.667*** (0.069)	0.615*** (0.074)
<i>Crop = 1</i>	3.123 (5.984)	-51.285** (22.523)	-46.564* (25.126)	-44.517*** (14.248)	-74.029*** (24.374)
<i>Growth</i>	1.800* (0.968)	0.920 (1.019)	2.293* (1.263)	1.713* (0.971)	2.031** (0.977)
<i>Crop*G</i>	-3.227*** (1.047)	-2.178* (1.111)	-3.198** (1.363)	-2.702*** (1.011)	-2.895*** (1.069)
<i>Gini</i>		-0.898*** (0.260)	-0.888*** (0.324)		-0.535* (0.308)
<i>Crop*Gini</i>		1.089** (0.445)	1.122** (0.477)		0.803* (0.426)
<i>PPE</i>				-4.184*** (1.175)	-3.168*** (1.086)
<i>Crop*PPE</i>				7.161*** (1.811)	6.199*** (1.768)
<i>Constant</i>	4.521 (6.247)	53.822*** (17.371)	47.589** (21.329)	33.627*** (12.262)	53.418*** (19.116)
<i>Obs</i>	105	105	101	101	101
<i>N</i>	33	33	32	32	32
<i>R²</i>	0.68	0.72	0.71	0.74	0.75

Notes: Estimated by OLS with time dummies for 5 year periods; dependent variable is period \$1.25 a day poverty level weighted by 2010 population; *P0* indicates initial poverty (first observation for the country in the sample); *Growth* refers to annual GDP growth over the period between surveys; *Crop* indicates crop-based country; *PPE* is pro-poor expenditure as a share of GDP (overall period average); *Gini* is inequality for the current period; *N* = number countries; *Obs* = *N* times periods (surveys). Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Including PPE loses Nigeria from the sample; (3) reproduces (2) without Nigeria.

Table 6 Determinants of \$1.25 Poverty (additional variables)

	(1)	(2)	(3)	(4)
<i>P0</i>	0.616*** (0.078)	0.606*** (0.100)	0.645*** (0.078)	0.659*** (0.082)
<i>Crop = 1</i>	-73.073*** (24.748)	-67.517** (28.091)	-81.436*** (21.368)	-84.650*** (20.920)
<i>Growth</i>	2.020** (0.993)	2.578*** (0.967)	2.431*** (0.895)	1.392 (0.959)
<i>Crop*Growth</i>	-2.905*** (1.086)	-4.096*** (1.105)	-3.462*** (0.953)	-2.721*** (0.963)
<i>Gini</i>	-0.511 (0.316)	-0.449 (0.373)	-0.796*** (0.241)	-0.863*** (0.235)
<i>Crop*Gini</i>	0.787* (0.430)	0.752 (0.487)	1.081*** (0.372)	1.056** (0.408)
<i>PPE</i>	-3.073*** (1.102)	-3.897*** (1.348)	-3.241*** (0.970)	-3.008*** (0.944)
<i>Crop*PPE</i>	6.150*** (1.851)	6.280*** (1.901)	6.565*** (1.659)	6.703*** (1.605)
<i>Post Conf</i>	-8.210** (4.117)			
<i>Crop*Post Conf</i>	6.713 (6.680)			
<i>Agrix</i>		-0.055 (0.540)		
<i>Crop*Agrix</i>		0.108 (0.768)		
<i>Fuelx</i>		-0.390 (0.264)		
<i>Crop*Fuelx</i>		-0.438 (0.346)		
<i>D</i>			11.244*** (3.930)	
<i>Crop*D</i>			-18.756*** (6.654)	
<i>Polity</i>				1.390*** (0.419)
<i>Crop*Polity</i>				-2.227*** (0.538)
<i>Constant</i>	52.311*** (19.282)	56.861** (23.918)	57.969*** (16.208)	55.545*** (16.058)
Obs	101	100	101	101
N	32	31	32	32
R-squared	0.76	0.78	0.78	0.78

Notes: As for Table 5 except: *Post Conf* is a dummy = 1 for the 10 years following a conflict; *Fuelx* is fuel and ore exports as % GDP (agriculture and food exports were also included but always insignificant); *Polity* is the democracy score ranging from -10 to 10, and *D* is a binary democracy variable taking the value 1 if the Polity score is above 6 and 0 otherwise (all defined in Table A1).

Table 7 Determinants of £1.25 Poverty Performance (split sample)

	Crop	Resource	Crop	Resource
<i>P0</i>	0.520*** (0.128)	0.997*** (0.166)	0.505*** (0.134)	0.838*** (0.137)
<i>Growth</i>	-1.602** (0.636)	0.200 (1.028)	-1.501** (0.711)	0.609 (0.960)
<i>PPE</i>	2.644* (1.466)	-3.299*** (1.171)	2.659* (1.470)	-2.243* (1.272)
<i>Agrix</i>	-0.248 (0.345)	-0.160 (0.783)	-0.289 (0.336)	-0.600 (0.703)
<i>Fuelx</i>	-0.859*** (0.249)	-0.340 (0.308)	-0.872*** (0.243)	-0.200 (0.260)
<i>Post Conf</i>	2.345 (5.778)	-5.459 (5.148)	1.762 (5.708)	-6.873* (3.817)
<i>Polity</i>	-0.472 (0.592)	0.943* (0.540)	-0.412 (0.617)	1.286*** (0.450)
<i>Gini</i>			0.237 (0.299)	-0.863*** (0.303)
<i>Constant</i>	3.354 (18.637)	26.144* (13.204)	-3.944 (19.156)	66.363*** (16.775)
Observations	62	38	62	38
N	19	12	19	12
R ²	0.70	0.91	0.70	0.92

Note: As for Table 6 except separate crop and resource samples.

The results in Table 5 confirm the intuition of Figure 1 that the influence of history is critical: Crop is a highly significant determinant of poverty and crop-based economies have been more successful in reducing poverty.⁶ Only in the first column is Crop insignificant although even here the inference is that given growth, crop-based economies achieve lower poverty. Initial poverty is clearly important and suggests a baseline of poverty being reduced by a third on average. Growth is significant but positive; the interaction term suggests that this is because resource economies tend to have higher growth and poverty (and less poverty reduction) as growth in crop economies does reduce poverty. Higher inequality appears to be associated with lower poverty except in crop economies: conditional on being a crop economy, higher Gini is associated with higher poverty. This may be because resource economies have higher inequality independent of poverty performance. In contrast, higher PPE is associated with lower poverty except in crop economies. A possible inference is that the higher levels of PPE in resource economies permit lower poverty than would otherwise be the case (given the characteristics of resource economies), whereas PPE is not instrumental in poverty reduction in crop economies. Very similar results are obtained if the \$1.90 poverty line is used (see Table A5).

Table 6 introduces additional controls into the basic specification. Results for variables in Table 5 are effectively unaltered and the additional variables add a little explanatory power. The post-conflict dummy is negative and significant irrespective of being a crop

⁶ This result applies whether or not the regressions are weighted by population. If poverty is measured as \$1.90 per day, *Crop* is insignificant if and only if the estimates are not weighted by population size.

or resource economy, consistent with conflict being a negative shock that increases poverty. The post-conflict period is thus one of poverty reduction (perhaps reflecting a higher starting point as a result of conflict). Variables capturing the composition of exports are not significant. Democracy, whether measured as a binary (D) or continuous ($Polity$) variable, tends to be associated with higher poverty except in crop economies (where poverty is lower). Similar results are found if the \$1.90 poverty line is used except that post-conflict and D coefficients are insignificant (see Table A6); these may be because of the slight change in the sample or because these factors are more important for more extreme levels of poverty (a lower poverty line).

As another way of comparing the two Africas, Table 7 reports results separately for crop and resource countries. A distinguishing feature for resource economies is the significant coefficient on initial poverty indicating that on average poverty remains constant. In resource economies, higher PPE is associated with lower poverty (highly significant if Gini is omitted) but democracy appears to be associated with higher poverty. The significantly better performance of crop economies is clear: on average poverty falls by almost half the initial level. Growth and fuel and ore exports are the only variables that seem to influence poverty reduction in crop economies. Although the regression does not identify the mechanisms, the principal finding is that crop economies are indeed better able to translate growth into poverty reduction. Similar results hold using the \$1.90 poverty measure (Table A7).

There are some differences in results using the national poverty line as shown in Table 8, although the sample is smaller (especially for the number of observations). Initial poverty remains significant but average poverty reduction is much greater using national lines. This may be because although the international poverty line is often not much higher than the national line, a large number of households are clustered around the poverty lines so a small change in the line can have a large impact on the poverty headcount; this was the case in Tanzania (World Bank, 2015: 20). The crop economies again perform better but this is not evidently associated with growth, inequality or PPE: growth is associated with poverty reduction irrespective of country type whereas for crop economies PPE is associated with higher poverty. Nevertheless, the core result that crop economies outperform resource economies in poverty reduction remains.

Although the nature of the data limits the estimation strategies that are feasible, Appendix B reports alternatives to OLS: random effects without population weighting and population-averaged estimates using the generalised estimation equation (Cameron and Trivedi, 2008). In general the alternative estimators preserve the main results although the significance levels of PPE and Gini coefficients are reduced or eliminated. Results for the split sample as in Table 8 appear to be the most robust, suggesting that explanatory variables have significantly different impacts on crop and resource economies.

Table 8 Determinants of Performance, National Poverty Line

	(1)	(2)	(3)	(4)	(4)
<i>P0</i>	0.289*** (0.085)	0.276*** (0.083)	0.265*** (0.070)	0.314*** (0.076)	0.433*** (0.133)
<i>Crop = 1</i>	-33.071*** (9.854)	-28.531** (10.658)	-33.576*** (12.156)	-17.218 (18.048)	-34.949 (21.896)
<i>Growth</i>	-1.956*** (0.394)	-0.992 (0.691)	-0.941 (0.718)	-0.912 (0.718)	-0.448 (0.761)
<i>Crop*Growth</i>		-1.166 (0.820)	-1.164 (0.840)	-1.289 (0.860)	-1.331 (0.915)
<i>Gini</i>			0.006 (0.193)	0.253 (0.388)	0.379 (0.535)
<i>Crop*Gini</i>				-0.432 (0.449)	-0.670 (0.621)
<i>PPE</i>	-2.667*** (0.931)	-2.744*** (1.009)	-2.807** (1.217)	-3.507* (1.770)	-4.029* (2.009)
<i>Crop*PPE</i>	2.716* (1.426)	2.778* (1.505)	3.650** (1.772)	4.190* (2.292)	6.926*** (2.487)
<i>Agrix</i>					-0.445 (0.382)
<i>Crop* Agrix</i>					0.756* (0.419)
<i>Fuelx</i>					-0.567** (0.255)
<i>Crop*Fuelx</i>					1.170*** (0.361)
<i>Constant</i>	66.173*** (8.617)	61.745*** (9.729)	61.994*** (10.818)	53.405*** (15.030)	47.951* (23.727)
Obs	51	51	49	49	48
N	25	25	23	23	22
R-squared	0.71	0.72	0.71	0.72	0.81

Notes: As for Table 5; additional variables from Table 6 were tested but always insignificant. The estimates are based on the sample of poverty headcount ratios using comparable national poverty lines (World Bank Poverty and Equity Dataset, SI.POV.NAHC). We also tested for the larger sample (N=32) including countries with non-comparable national poverty lines (SI.POV.NAGP.NC) but results were largely unchanged (Appendix Table A8).

5. Conclusions

A political commitment by government is essential to reduce poverty. How can we explain whether an effective pro-poor coalition materialises or not? Several countries that reduced poverty ('improvers' in Table 1), such as Sierra Leone, Uganda, Rwanda and Mozambique, may have responded to experience of civil war by realising that policies which favour one regional or ethnic group to the exclusion of others risk re-igniting conflict, and that an inclusive approach to the allocation of government resources is needed to pre-empt that risk. In many cases a broker, who may or may not be an aid donor, is often a vital influence in holding together the members of a

pro-poor coalition around an agreed set of pro-poor policies.⁷ Finally, to state the obvious, targeting the poor requires pro-poor expenditure programmes and these require resources: the ability to achieve a long-term increase in tax revenue, despite the obvious obstacles to doing this in a fragile state, and to achieve adequate aid inflows to finance a pro-poor development programme may also be important determinants of the ability to put together a lasting coalition (Mosley, 2015),⁸ and thence of the poverty trajectory.

The paper argues that colonial experience has been an important factor in laying the foundations for whether the politics that emerged following independence was predisposed to inclusive growth that facilitated poverty reduction. In crop-based colonial economies smallholder producers were economically more important and had potentially greater political weight after independence (although this was not always realised). Resource-based colonial economies, in contrast, fostered a less inclusive politics after independence (subsequent major resource discoveries had a similar effect). This, combined with the tendency of resource sectors to have relatively weaker linkages with the rest of economy, implied that growth was less likely to translate into poverty reduction. The major finding of the analysis in the paper is that crop economies performed significantly better in reducing poverty (since around 1990 when growth took off). On average, crop economies reduced poverty by almost half in the two decades after 1990 whereas resource economies, on average, failed to reduce poverty significantly. Growth in GDP and having higher resource exports are the principal determinants of the rate of poverty reduction in crop economies, whereas neither are significant in resource economies. The main finding is that crop economies are better able than resource economies to translate growth into poverty reduction.

The essence of our story consists of three elements. First, *history*: colonial and post-colonial policies determine economic structure (in particular a country's status as a 'mine-plantation type' or a 'peasant export-type' economy), the extent of linkages from the core sector to the economy (through demand for factors and inputs and supply of inputs to further processing) and the initial distribution of economic opportunities between rich and poor. Second, *shocks* (and defences against them) affect the historical legacy by either consolidating determined government policies and institutional reforms which bring a lasting pro-poor political settlement, or eroding them through the effect of lasting shocks and malfunctioning institutions. In this context resource discoveries are an important shock. Third, *policies* are fundamental as lasting pro-poor political settlements will only happen if governments are motivated to make them happen, in other words if a pro-poor political economy can be brought into being and embodied in a pro-poor ruling coalition.

In contrast to a literature which has tended to analyse African poverty trends in an aggregative way as either good or bad for the continent as a whole, the focus here is on inter-country differences, which are dramatic. There appear to be two distinct groups of SSA countries, in one of which the gains from growth have been widely spread among the population whereas in the other only a select minority have been able to climb the income ladder, and colonial legacy is an important factor in distinguishing the two groups. Sadly, the Africa which provides the most illustrations of dramatic improvement in the living standards of the poor consists mainly of small countries: with the exception of Ethiopia, no large country in Africa has cracked the

⁷ An important case where the key broker was not an aid donor but a civil servant is the case of Uganda in the early 1990s, where the conversion of a reluctant President Museveni to the cause of a pro-poor expenditure programme, supported by the World Bank and other aid donors, was achieved by Emanuel Tumusime-Mutabile, then the Permanent Secretary to the Ministry of Finance. See Mosley (2012: 63-64)

⁸ Aid donors supply not only money, of course, but also policy advice. The impact of policy conditionality is highly controversial, but Gomanee *et al* (2005) suggest that during the 1990s and early 2000s conditionality was an important influence on developing countries adopting pro-poor expenditure programmes, especially in the health and education fields.

problem of how to cut poverty fast. There is a very wide variance between the best and the worst cases, a phenomenon which has been little discussed, and our purpose has been to understand this variance.

The more inclusive of the two Africas, in most but not all cases, consists of countries which in colonial times relied on African smallholder exports to achieve viability – thereby providing a potential vehicle for broad-based development, as a high proportion of low-income Africans nonetheless have a little tea, coffee, cotton or cocoa on their plots and many more work for people who do. But not all former ‘peasant export economies’, by any means, have been able to capitalise on this asset, nor have the countries which lacked it been barred from overcoming the barriers to successful poverty reduction – provided they had the necessary political will, and the necessary capacity and imagination to assemble a set of policy instruments appropriate to local circumstances. The paper explores the nature of that set of policy instruments and what might be the secret of forming the ‘pro-poor coalitions’ required to convert policy instruments into a workable development strategy.

The analysis focused on public expenditure not because other policy tools are not important, but because without investment in human capital (through social sector expenditures) most of the other instruments will not work. There is some evidence that a pro-poor expenditure pattern influences poverty reduction in resource economies (where the level is higher than in crop economies) – redistributive spending can counteract the other characteristics that act against poverty reduction. In crop economies, in contrast, higher pro-poor spending is associated with higher poverty (perhaps because, *ceteris paribus*, higher poverty motivates spending). The main motivational factors bringing into being a pro-poor political settlement, and thus a pro-poor expenditure pattern, appear to be above all an adequate capacity to generate revenue, and in certain cases recent experience of conflict, which appears to ‘concentrate minds’ and induce a more long-term and inclusive approach to policy. A broker able to act as an intermediary between aid donors and government also appears to be an important factor influencing the pattern of public spending.

These lessons must be stated with caution, partly because the statistics are questionable and partly because so many of the influences which determine poverty appear to be local. Maybe the most crucial influence not yet properly examined is the political significance of smallholder agricultural interests. This would be difficult to quantify (the crop base is the proxy used here), but where smallholders are politically strong, poverty reduction performance has been good, and wherever they are weak poverty reduction performance has been bad. Trying to convert this intuition into a serious investigation of the mechanisms through which it works (if it does work) represents an important frontier for future research.

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Appendix A: Data and Classifications

Appendix Table A1: Data Sources and Definitions

Variable	Indicator	Source
GDP per capita	GDP per capita	World Development Indicators 2012 ("WDI 2012"). Available online: http://data.worldbank.org/data-catalog/world-development-indicators
Poverty \$1.25	\$1.25 and \$2 per day (2005 PPP); National poverty line	World Bank POVCAL data from http://iresearch.worldbank.org/POVcalNet/index.htm?2 , accessed 23 rd April 2015
Poverty \$1.90	\$1.90 per day (2010 PPP)	World Bank POVCAL data from http://iresearch.worldbank.org/POVcalNet/index.htm?2 , accessed 3 rd November 2015
Colonial heritage	Crop-based (Cash crop) Resource-based (Labour Reserve and Concession Companies)	Adapted from Mkandawire (2010)
Growth	Average GDP growth rate between poverty observations	World Development Indicators 2012 ("WDI 2012"). Available online: http://data.worldbank.org/data-catalog/world-development-indicators
Gini	Gini coefficient	World Bank POVCAL data from http://iresearch.worldbank.org/POVcalNet/index.htm?2 , accessed 23 rd April 2015
PPE	Public expenditure on health and education as a percentage of GDP averaged over years for which data are available from 1980-2013.	Calculated using data from World Development Indicators 2012 ("WDI 2012"). Available online: http://data.worldbank.org/data-catalog/world-development-indicators
Democracy	1= democracy 0 =non democratic	Based on Polity II Dataset. Values above 6 are considered democracies http://www.systemicpeace.org/polity/polity4.htm
Polity	Polity measure is a raw score ranging from -10 to 10	Polity II Dataset. http://www.systemicpeace.org/polity/polity4.htm

Post Conflict	1= Within 10 years after a conflict 0 = Currently in conflict or >10 since a conflict	Based on data from Uppsala Conflict Data Program (UCDP). http://www.pcr.uu.se/research/ucdp/datasets/
Agrix	Food and agricultural raw materials exports as % of GDP averaged over years data is available from 1980-2013.	Calculated using data from World Development Indicators 2012 ("WDI 2012"). Available online: http://data.worldbank.org/data-catalog/world-development-indicators
Fuelx	Fuel and ore exports as % of GDP averaged over years data is available from 1980-2013.	Calculated using data from World Development Indicators 2012 ("WDI 2012"). Available online: http://data.worldbank.org/data-catalog/world-development-indicators

Note: Data file available on request.

List of countries coded as democracies (D=1, otherwise 0)

Benin (2006-2010), Botswana (1987-2010), Gambia (1980-1993), Ghana (2004-2010), Kenya (2002-2010), Madagascar (1992-2008), Mali (1992- 1996; 2002-2010), Niger (1992-1995), Nigeria (1980-1983), Senegal (2000-2010), Sierra Leone (2007-2010), South Africa (1993-2010), Zambia (2008-2010).

Table A2 Sample Countries and \$1.90 Poverty Performance 1990-2013

Country	Period	surveys	% Δ GDP pa	\$1.90 Poverty Headcount			Elasticity
				Initial	Current	% Δ pa	
Gambia	1998-2003	2	4.1	73.8	45.3	-9.3	-2.2
Congo, Rep.	2005-2011	2	5.4	50.2	28.7	-8.9	-1.7
Mauritania	1987-2008	6	1.4	40.1	10.9	-6.0	-4.3
Chad	2003-2011	2	10.1	62.9	38.4	-6.0	-0.6
Namibia	1994-2010	3	4.2	52.9	22.6	-5.2	-1.2
Ghana	1988-2006	5	4.7	63.8	25.2	-5.0	-1.1
Swaziland	1995-2009	3	2.7	81.7	42.0	-4.6	-1.7
Guinea	1991-2012	5	3.3	92.3	35.3	-4.5	-1.3
Cameroon	1996-2007	3	4.0	48.1	29.3	-4.4	-1.1
Ethiopia	1995-2011	4	7.5	67.9	33.5	-4.3	-0.6
Uganda	1989-2012	8	6.8	88.0	33.2	-4.1	-0.6
Botswana	1986-2009	4	5.8	42.6	18.2	-3.6	-0.6
South Africa	1993-2011	6	3.2	31.9	16.6	-3.6	-1.1
Mali	1994-2010	4	5.5	84.9	49.3	-3.3	-0.6
Senegal	1991-2011	5	3.5	68.0	38.0	-2.9	-0.8
Burkina Faso	1994-2009	4	5.8	83.1	55.3	-2.7	-0.5
Niger	1993-2011	5	3.7	78.2	50.3	-2.4	-0.6
Congo, Dem Rep	2005-2012	2	6.0	91.2	77.2	-2.4	-0.4
Tanzania	1992-2012	4	5.3	70.4	46.6	-2.0	-0.4
Mozambique	1996-2009	3	7.7	85.4	68.7	-1.7	-0.2
C. African Rep.	1992-2008	3	2.5	84.3	66.3	-1.5	-0.6
Sierra Leone	1990-2011	3	2.4	65.5	52.3	-1.1	-0.4
Lesotho	1987-2010	4	4.1	74.8	59.7	-1.0	-0.2
Weighted Average 'High Performers'			5.6	70.1	42.6	-3.5	-0.7
Togo	2006-2011	2	3.5	55.6	54.2	-0.5	-0.1
Burundi	1992-2006	3	-0.5	81.1	77.7	-0.3	0.6
Rwanda	1985-2011	4	4.8	63.7	60.3	-0.2	0.0
Malawi	1998-2010	3	4.1	63.6	70.9	0.9	0.2
Benin	2003-2011	2	3.5	48.9	53.1	1.1	0.3
Weighted Average 'Uncertain'			3.2	63.1	64.5	0.3	0.2
Nigeria	1986-2010	5	4.7	46.0	53.5	0.6	0.1
Zambia	1991-2010	8	4.6	54.1	64.4	0.9	0.2
Madagascar	1993-2010	6	2.8	69.4	81.8	1.0	0.3
Guinea-Bissau	1991-2010	4	1.9	43.0	67.1	2.4	1.3
Kenya	1992-2005	4	2.5	23.1	33.6	2.9	1.2
Cote d'Ivoire	1985-2008	10	1.7	6.8	29.0	6.5	3.9
Weighted Average 'Deteriorating'			3.9	41.8	51.5	1.5	0.6

Notes: As for Table 1.

Table A3: Tests for Difference in Group Means (\$1.25)

Panel A: P-values for t-tests on Unweighted means

Comparison	% Δ GDP pa	\$1.25 Poverty Headcount			Elasticity
		Initial	Current	% Δ pa	
Improvers vs Uncertain	0.039	0.328	0.001	0.000	0.000
Improvers vs Deteriorating	0.015	0.040	0.026	0.015	0.054
Improvers vs Low Reducers	0.004	0.055	0.000	0.001	0.016
Uncertain vs Deteriorating	0.462	0.072	0.432	0.090	0.118

Panel B: Unweighted mean differences

Comparison	% Δ GDP pa	\$1.25 Poverty Headcount			Elasticity
		Initial	Current	% Δ pa	
Improvers vs Uncertain	1.8	3.0	-22.5	-3.1	-0.8
Improvers vs Deteriorating	1.9	19.3	-20.8	-6.6	-2.7
Improvers vs Low Reducers	1.8	11.2	-21.6	-4.9	-1.8
Uncertain vs Deteriorating	0.1	16.3	1.7	-3.5	-1.9

Notes: Tests for statistical differences in means for \$1.25 a day poverty reported in Table 1. Low Reducers are Uncertain plus Deteriorating groups. Panel B reports differences in means, Panel A reports p-values for t-tests on means.

Table A4: Tests for Difference in Group Means (\$1.90)

Panel A: P-values for t-tests on Unweighted means

Comparison	% Δ GDP pa	\$1.90 Poverty Headcount			Elasticity
		Initial	Current	% Δ pa	
Improvers vs Uncertain	0.075	0.184	0.002	0.000	0.000
Improvers vs Deteriorating	0.013	0.012	0.085	0.000	0.006
Improvers vs Low Reducers	0.007	0.011	0.005	0.000	0.000
Uncertain vs Deteriorating	0.483	0.035	0.206	0.031	0.081

Panel B: Unweighted mean differences

Comparison	% Δ GDP pa	\$1.90 Poverty Headcount			Elasticity
		Initial	Current	% Δ pa	
Improvers vs Uncertain	1.7	6.2	-22.2	-4.1	-1.2
Improvers vs Deteriorating	1.7	28.4	-13.9	-6.3	-2.2
Improvers vs Low Reducers	1.7	18.3	-17.7	-5.3	-1.7
Uncertain vs Deteriorating	0.0	22.2	8.3	-2.2	-1.0

Notes: As for Table A3 except refers to \$1.90 a day poverty reported in Table A2.

Table A5 Determinants of Poverty (\$1.90 headcount)

	(1)	(2)	(2b)	(3)	(6)
<i>P0</i>	0.710*** (0.062)	0.660*** (0.064)	0.618*** (0.065)	0.640*** (0.058)	0.609*** (0.060)
<i>Crop = 1</i>	0.392 (6.058)	-46.685** (19.724)	-36.104* (20.715)	-30.102** (13.924)	-56.325** (23.243)
<i>Growth</i>	1.129 (1.004)	0.401 (0.991)	2.368** (0.913)	1.910** (0.897)	2.188** (0.848)
<i>Crop*G</i>	-3.153*** (0.955)	-2.303** (0.975)	-4.064*** (0.886)	-3.748*** (0.828)	-3.916*** (0.814)
<i>Gini</i>		-0.662*** (0.210)	-0.715*** (0.224)		-0.536** (0.253)
<i>Crop*Gini</i>		0.965** (0.418)	0.957** (0.439)		0.807* (0.440)
<i>PPE</i>				-2.844*** (0.895)	-1.380 (0.861)
<i>Crop*PPE</i>				5.584*** (2.020)	4.168** (2.033)
<i>Constant</i>	11.214 (8.456)	47.757*** (14.694)	39.985** (15.441)	24.109** (10.368)	40.250*** (14.319)
Obs	107	107	103	103	103
N	34	34	33	33	33
R ²	0.63	0.67	0.71	0.72	0.73

Notes: Corresponds to Table 5 except for \$1.90 a day poverty measure.

Table A6 Determinants of Poverty (\$1.90, additional variables)

	(1)	(2)	(3)	(4)
<i>P0</i>	0.600*** (0.060)	0.513*** (0.091)	0.616*** (0.060)	0.590*** (0.065)
<i>Crop = 1</i>	-55.678** (23.342)	-44.917* (26.916)	-62.170*** (21.728)	-67.126*** (23.267)
<i>Growth</i>	2.264*** (0.851)	3.147*** (0.758)	2.453*** (0.873)	2.011** (0.870)
<i>Crop*Growth</i>	-3.936*** (0.804)	-5.377*** (0.826)	-4.275*** (0.794)	-3.572*** (0.726)
<i>Gini</i>	-0.596** (0.246)	-0.309 (0.349)	-0.717*** (0.243)	-0.864*** (0.242)
<i>Crop*Gini</i>	0.814* (0.436)	0.697 (0.497)	1.002** (0.427)	1.144** (0.474)
<i>PPE</i>	-1.323 (0.872)	-2.795** (1.140)	-1.366* (0.819)	-1.272* (0.731)
<i>Crop*PPE</i>	3.909* (2.066)	5.585***	4.376** (1.958)	4.013** (2.004)
<i>Post Conf</i>	4.597 (5.365)			
<i>Crop*Post Conf</i>	0.600 (7.324)			
<i>Agrix</i>		0.498 (0.520)		
<i>Crop*Agrix</i>		-1.033 (0.660)		
<i>Fuelx</i>		-0.336 (0.251)		
<i>Crop*Fuelx</i>		-0.147 (0.434)		
<i>D</i>			6.197 (3.900)	
<i>Crop*D</i>			-11.898 (7.999)	
<i>Polity</i>				1.185** (0.463)
<i>Crop*Polity</i>				-1.141** (0.570)
<i>Constant</i>	41.545*** (14.051)	43.726* (22.941)	44.091*** (13.565)	51.480*** (14.915)
Obs	103	101	103	103
N	33	31	33	33
R ²	0.74	0.74	0.74	0.75

Notes: Corresponds to Table 6 except for \$1.90 a day poverty measure.

Table A7 Determinants of Poverty (\$1.90, split sample)

	(Crop)	(Resource)	(Crop)	(Resource)
<i>P0</i>	0.334** (0.129)	0.743*** (0.096)	0.270** (0.131)	0.646*** (0.089)
<i>Growth</i>	-1.565* (0.823)	1.453* (0.841)	-1.391 (0.861)	1.758** (0.794)
<i>PPE</i>	1.995 (1.715)	-2.971*** (0.956)	1.922 (1.739)	-1.872** (0.888)
<i>Agrix</i>	-0.939** (0.433)	1.187** (0.476)	-1.137*** (0.406)	0.650 (0.471)
<i>Fuelx</i>	-0.658* (0.348)	-0.140 (0.279)	-0.755** (0.327)	-0.102 (0.314)
<i>Post Conf</i>	7.987 (5.998)	6.052 (5.026)	7.338 (5.939)	9.199 (5.704)
<i>Polity</i>	0.309 (0.622)	0.845 (0.516)	0.497 (0.631)	1.185** (0.484)
<i>Gini</i>			0.525 (0.337)	-0.694** (0.316)
<i>Constant</i>	32.140 (21.497)	18.990* (10.453)	20.895 (22.288)	49.819*** (17.325)
Obs	64	37	64	37
N	19	12	19	12
R ²	0.67	0.90	0.69	0.91

Notes: Corresponds to Table 7 except for \$1.90 a day poverty measure.

Table A8 National poverty data including non-comparable values

	(1)	(2)	(3)	(4)	(5)
<i>P0</i>	0.243*** (0.066)	0.258*** (0.063)	0.290*** (0.061)	0.314*** (0.058)	0.337*** (0.089)
<i>Crop = 1</i>	-25.009*** (9.087)	-19.475** (8.737)	-22.544** (9.327)	-11.656 (15.049)	-25.841 (18.087)
<i>Growth</i>	-1.247*** (0.256)	-0.682** (0.261)	-0.684** (0.260)	-0.695*** (0.261)	-0.495* (0.268)
<i>Crop*Growth</i>		-1.325*** (0.473)	-1.264** (0.484)	-1.272*** (0.474)	-1.590*** (0.523)
<i>Gini</i>			0.237 (0.163)	0.366 (0.228)	0.313 (0.285)
<i>Crop*Gini</i>				-0.272 (0.295)	-0.266 (0.370)
<i>PPE</i>	-2.592*** (0.821)	-2.573*** (0.792)	-2.973*** (0.866)	-3.196*** (0.937)	-3.520*** (1.131)
<i>Crop*PPE</i>	1.469 (1.280)	1.579 (1.291)	2.498* (1.432)	2.701* (1.475)	3.884** (1.788)
<i>Agrix</i>					-0.639* (0.374)
<i>Crop* Agrix</i>					0.565 (0.461)
<i>Fuelx</i>					-0.437*** (0.148)
<i>Crop*Fuelx</i>					0.570** (0.249)
Constant	60.345*** (9.582)	57.167*** (9.108)	47.497*** (11.087)	42.065*** (12.644)	53.328*** (16.908)
Obs	94 32	94 32	92 32	92 32	90 31
R-squared	0.669	0.690	0.694	0.698	0.736

Notes: Corresponds to Table 8 except with the larger sample.

Table A9: Comparable National Poverty Line Data

Country	Time Period	Years	Surveys	National Poverty Headcount		
				Initial	Current	% Δpa
Rwanda	2006 - 2011	5	2	56.7	44.9	-4.16
Ghana	2006 - 2012	6	2	31.9	24.2	-4.02
Namibia	1994 - 2009	15	3	69.3	28.7	-3.91
Uganda	1992 - 2009	17	6	56.4	24.5	-3.33
Botswana	1990 - 2009	19	4	44.1	19.3	-2.96
Sierra Leone	2003 - 2011	8	2	66.4	52.9	-2.54
Mali	2001 - 2010	9	3	55.6	43.6	-2.40
Cameroon	1996 - 2007	11	3	53.3	39.9	-2.29
Mauritania	2000 - 2008	8	3	51	42	-2.21
Ethiopia	1995 - 2011	16	4	45.5	29.6	-2.18
Malawi	1998 - 2010	12	3	65.3	50.7	-1.86
Chad	2003 - 2011	8	2	54.8	46.7	-1.85
Mozambique	1996 - 2009	13	3	69.4	54.7	-1.63
Senegal	2001 - 2011	10	3	55.2	46.7	-1.54
Burkina Faso	2003 - 2009	6	2	51.1	46.7	-1.44
Congo, Rep.	2005 - 2011	6	2	50.7	46.5	-1.38
Swaziland	2001 - 2009	8	2	69	63	-1.09
Togo	2006 - 2011	5	2	61.7	58.7	-0.97
Lesotho	1994 - 2010	16	3	66.6	57.1	-0.89
Nigeria	2004 - 2010	6	2	48.4	46	-0.83
Guinea	1994 - 2012	18	4	62.6	55.2	-0.66
Benin	2006 - 2011	5	4	37.2	36.2	-0.54
Madagascar	2001 - 2010	9	3	70.8	75.3	0.71
Guinea-Bissau	2002 - 2010	8	2	64.7	69.3	0.89
South Africa	1995 - 2011	16	4	31	45.5	2.92
Côte d'Ivoire	1990 - 2008	18	5	25.4	42.7	3.78

Source: Comparable national poverty lines reported in the World Bank Poverty and Equity Dataset (SI.POV.NAHC).

Appendix B: Replications with Alternative Estimators

The first robustness check is to use a random effects estimator (fixed effects is not feasible given the number of time-invariant variables); Breusch and Pagan Lagrangian multiplier tests support the use of random effects for all cases. This allows for the inclusion of individual country effects whilst imposing the assumption that these effects are not correlated with the independent variables. Tables B1-B3 replicate the results of Tables 5-7 in the text using random effects. The results are very similar for the main variables of interest (P0, Crop and Growth); albeit with Crop having smaller coefficients and as a result sometimes being less significant or insignificant. Growth and its interaction with crop generally become more significant apart from when the sample is split into crop and resource economies (Table B3). PPE and Gini become insignificant in nearly all regressions although their interactions with crop retain significance throughout. Significance levels are reduced for some of the additional variables (with democracy dummy losing all significance) but these are not major differences (Table B2). When the sample is split (Table B3), little is changed apart from PPE becoming insignificant for resource economies and growth becoming less significant or insignificant for crop economies.

As one can no longer do population weighting with random effects, Tables B4-B6 replicate the results of Tables 5-7 in the text using a population-averaged estimation method which allows for population weighting. The population-averaged estimates are obtained using the generalised estimation equation (GEE) approach whereby specifying a normal distribution for the dependent variable, using an identity link function and assuming equicorrelated/exchangeable errors gives estimates which are asymptotically equivalent to random effects estimation (Cameron and Trivedi, 2008: 720).

The results are again very similar for the main variables (largely unchanged with crop having a smaller coefficient and sometimes losing significance); PPE and Crop*PPE generally retain significance albeit sometimes at a lower level, Gini sometimes loses significance as well as its interaction with crop always being insignificant, and the constant is almost always insignificant. Significance is also generally retained for the additional variables in Table B5 although often at a lower level (Democracy is just marginally insignificant at the 10% level whereas the crop and post conflict interaction becomes significant). When the sample is split (Table B6); Post conflict, Polity and Gini all lose significance as well as PPE losing significance in 3 of the 4 regressions. For the other variables results are largely the same except for growth which gains in significance.

The Pooled OLS estimates in Tables 5-8 all use robust standard errors which accounts for heteroskedasticity. Clustering the robust standard errors at the country level would also allow for serial correlation. However given there are quite large gaps between the time observations for each country and that many of our variables of interest are fixed over time, serial correlation is unlikely to be big problem. Furthermore clustering is recommended when T is large and as $N \rightarrow \infty$ (Cameron and Trivedi, 2008: 832); thus as T in our data is generally very small and N of a moderate size we have left the robust standard errors unclustered.

In general the alternative estimators preserve the main results but the significance levels of PPE and Gini coefficients are usually reduced if not eliminated. Results for the split sample appear to be the most robust and do suggest that Growth, PPE and Gini have significantly different impacts on crop and resource economies. The alternative estimates also suggest that Polity is a more robust variable than Democracy at capturing the influence of the political regime.

Table B1: Replication of Table 5 with Random Effects Estimation

	(1)	(2)	(3)	(4)	(5)
<i>P0</i>	0.650*** (0.119)	0.621*** (0.111)	0.616*** (0.113)	0.632*** (0.102)	0.614*** (0.098)
<i>Crop = 1</i>	8.765 (6.273)	-28.047 (23.378)	-29.048 (25.129)	-32.578* (17.656)	-62.504** (27.641)
<i>Growth</i>	1.668** (0.693)	1.908*** (0.601)	2.256*** (0.471)	1.792** (0.724)	2.155*** (0.504)
<i>Crop*G</i>	-2.568*** (0.748)	-2.692*** (0.701)	-2.975*** (0.607)	-2.560*** (0.791)	-2.828*** (0.623)
<i>Gini</i>		-0.415 (0.267)	-0.489 (0.307)		-0.410 (0.345)
<i>Crop*Gini</i>		0.814* (0.462)	0.873* (0.491)		0.780 (0.480)
<i>PPE</i>				-1.316 (1.279)	-0.800 (1.306)
<i>Crop*PPE</i>				6.285*** (2.382)	5.679** (2.273)
<i>Constant</i>	-2.981 (10.193)	19.597 (18.839)	21.162 (21.232)	7.246 (14.774)	24.085 (20.680)
Obs	105	105	101	101	101
N	33	33	32	32	32

Notes: As for Table 5

Table B2: Replication of Table 6 with Random Effects Estimation

	(1)	(2)	(3)	(4)
<i>P0</i>	0.607*** (0.098)	0.561*** (0.114)	0.642*** (0.113)	0.655*** (0.111)
<i>Crop = 1</i>	-67.452**	-72.335**	-	-67.679***
	(28.338)	(32.852)	68.285*** (24.247)	(25.708)
<i>Growth</i>	2.179*** (0.510)	2.433*** (0.474)	1.905*** (0.408)	1.677*** (0.407)
<i>Crop*Growth</i>	-2.876*** (0.631)	-3.365*** (0.567)	-2.565*** (0.525)	-2.423*** (0.561)
<i>Gini</i>	-0.477 (0.367)	-0.616 (0.416)	-0.495* (0.275)	-0.499 (0.304)
<i>Crop*Gini</i>	0.827* (0.491)	0.961* (0.533)	0.865** (0.437)	0.833* (0.486)
<i>PPE</i>	-0.890 (1.427)	-1.223 (1.390)	-1.132 (1.159)	-1.097 (1.096)
<i>Crop*PPE</i>	5.797** (2.396)	5.412** (2.328)	6.040*** (2.168)	6.162*** (2.062)
<i>Post Conf</i>	-4.971 (3.549)			
<i>Crop*Post Conf</i>	8.445* (5.011)			
<i>Agrix</i>		-0.357 (0.604)		
<i>Crop* Agrix</i>		0.290 (0.876)		
<i>Fuelx</i>		-0.483 (0.294)		
<i>Crop*Fuelx</i>		-0.199 (0.357)		
<i>D</i>			7.926 (6.376)	
<i>Crop*D</i>			-7.172 (7.979)	
<i>Polity</i>				1.055** (0.517)
<i>Crop*Polity</i>				-1.323* (0.741)
<i>Constant</i>	29.272 (21.559)	47.313* (28.741)	27.939* (16.058)	25.285 (16.145)
Obs	101	100	101	101
N	32	31	32	32

Notes: As for Table 6

Table B3: Replication of Table 7 with Random Effects Estimation

	(1)	(2)	(3)	(4)
<i>P0</i>	0.350*** (0.117)	1.149*** (0.175)	0.359*** (0.110)	0.997*** (0.103)
<i>Growth</i>	-0.676* (0.347)	-0.127 (1.333)	-0.571 (0.362)	0.499 (1.012)
<i>PPE</i>	4.018* (2.165)	-1.478 (1.054)	3.910* (2.174)	-0.749 (0.894)
<i>Agrix</i>	-0.636 (0.416)	-0.716 (0.733)	-0.597 (0.422)	-0.922 (0.613)
<i>Fuelx</i>	-0.765*** (0.218)	-0.196 (0.327)	-0.745*** (0.231)	-0.227 (0.247)
<i>Post Conf</i>	3.527 (4.105)	-7.919 (6.783)	3.524 (4.093)	-9.247* (5.334)
<i>Polity</i>	0.199 (0.596)	1.526*** (0.398)	0.284 (0.622)	1.412*** (0.408)
<i>Gini</i>			0.211 (0.343)	-0.820*** (0.289)
<i>Constant</i>	9.114 (21.533)		1.010 (25.167)	51.196** (21.162)
Obs	62	38	62	38
N	19	12	19	12

Notes: As for Table 7

Table B4: Replication of Table 5 with Population Averaged Method

	(1)	(2)	(3)	(4)	(5)
<i>P0</i>	0.803*** (0.147)	0.747*** (0.125)	0.690*** (0.115)	0.681*** (0.108)	0.655*** (0.110)
<i>Crop = 1</i>	0.600 (5.769)	-27.396 (24.201)	-16.776 (29.985)	-42.888* (22.109)	-57.390* (33.492)
<i>Growth</i>	1.075 (0.711)	0.924 (0.886)	2.302*** (0.756)	1.901** (0.937)	2.074*** (0.799)
<i>Crop*G</i>	-2.532*** (0.609)	-2.382*** (0.781)	-3.215*** (0.723)	-2.790*** (0.886)	-2.959*** (0.789)
<i>Gini</i>		-0.483* (0.285)	-0.435 (0.413)		-0.263 (0.338)
<i>Crop*Gini</i>		0.607 (0.505)	0.543 (0.599)		0.407 (0.506)
<i>PPE</i>				-3.643* (1.922)	-3.189* (1.681)
<i>Crop*PPE</i>				7.114** (2.883)	6.649** (2.641)
<i>Constant</i>	0.930 (9.907)	27.859 (18.305)	18.349 (25.400)	25.899 (18.748)	36.351 (25.316)
Obs	105	105	101	101	101
N	33	33	32	32	32

Notes: As for Table 5

Table B5: Replication of Table 6 with Population Averaged Method

	(1)	(2)	(3)	(4)
<i>P0</i>	0.645*** (0.107)	0.618*** (0.118)	0.685*** (0.124)	0.684*** (0.110)
<i>Crop = 1</i>	-56.695* (33.319)	-54.496 (37.996)	-66.481** (26.968)	-70.230*** (26.270)
<i>Growth</i>	2.172*** (0.810)	2.441*** (0.622)	2.117*** (0.747)	1.466** (0.722)
<i>Crop*Growth</i>	-3.080*** (0.787)	-3.677*** (0.558)	-3.062*** (0.691)	-2.701*** (0.668)
<i>Gini</i>	-0.311 (0.350)	-0.205 (0.431)	-0.524** (0.245)	-0.564** (0.267)
<i>Crop*Gini</i>	0.399 (0.490)	0.425 (0.582)	0.693 (0.437)	0.694 (0.453)
<i>PPE</i>	-3.101* (1.637)	-3.986** (1.959)	-3.155** (1.411)	-3.112** (1.420)
<i>Crop*PPE</i>	6.465** (2.762)	6.799*** (2.609)	6.715*** (2.414)	7.067*** (2.324)
<i>Post Conf</i>	-6.424* (3.538)			
<i>Crop*Post Conf</i>	9.886* (5.829)			
<i>Agrix</i>		0.220 (0.674)		
<i>Crop* Agrix</i>		-0.228 (0.971)		
<i>Fuelx</i>		-0.409 (0.356)		
<i>Crop*Fuelx</i>		-0.361 (0.418)		
<i>D</i>			9.833 (6.010)	
<i>Crop*D</i>			-13.130* (7.377)	
<i>Polity</i>				1.177** (0.549)
<i>Crop*Polity</i>				-1.932*** (0.638)
<i>Constant</i>	38.255 (25.119)	42.090 (32.426)	42.616** (18.152)	40.394** (18.036)
Observations	101	100	101	101
Number of country	32	31	32	32

Notes: As for Table 6

Table B6: Replication of Table 7 with Population Averaged Method

	(1)	(2)	(3)	(4)
<i>P0</i>	0.494*** (0.161)	0.844*** (0.164)	0.487*** (0.162)	0.740*** (0.150)
<i>Growth</i>	-1.069*** (0.350)	0.503 (0.545)	-1.024*** (0.370)	1.072* (0.629)
<i>PPE</i>	2.635 (2.021)	-3.456** (1.720)	2.603 (1.956)	-2.724 (1.726)
<i>Agrix</i>	-0.359 (0.452)	0.136 (0.806)	-0.389 (0.430)	-0.219 (0.756)
<i>Fuelx</i>	-0.857*** (0.297)	-0.429 (0.457)	-0.888*** (0.265)	-0.458 (0.439)
<i>Post Conf</i>	4.460 (5.306)	4.864 (3.823)	4.087 (5.250)	2.123 (2.713)
<i>Polity</i>	-0.168 (0.610)	0.594 (0.520)	-0.146 (0.628)	0.667 (0.520)
<i>Gini</i>			0.189 (0.317)	-0.587 (0.423)
<i>Constant</i>	6.382 (24.048)	25.838 (17.280)	0.631 (25.257)	54.497** (23.530)
Obs	62	38	62	38
N	19	12	19	12

Notes: As for Table 7