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***Politics, public expenditure and the evolution of
poverty in Africa 1920-2009***

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July 2010

BWPI Working Paper 125

Brooks World Poverty Institute
ISBN : 978-1-907247-24-8

Creating and sharing knowledge to help end poverty

www.manchester.ac.uk/bwpi

Abstract

We investigate the historical roots of poverty, with particular reference to the experience of Africa during the 20th century. We find that institutional inheritance is an important influence on current underdevelopment; but in addition, we argue that the influence of policies on institutions is highly significant, and that in Africa at least, a high representation of European settlers in land ownership and policy-making was a source of weakness, and not of strength. We argue this thesis, using mortality rates as a proxy for poverty levels, with reference to two settler colonies – Zimbabwe and Kenya – and two peasant export colonies – Uganda and Ghana. Our findings suggest that in Africa, settler-type political systems tended to produce highly unequal income distributions and, as a consequence, patterns of public expenditure and investment in human and infrastructural capital which were strongly biased against smallholder agriculture and thence against poverty reduction. Peasant-export type political systems, on the other hand, produced more equal income distributions, whose policy structures and, consequently, production functions were less biased against the poor. As a consequence, liberalisation during the 1980s and 1990s produced asymmetric results, with poverty falling sharply in the ‘peasant export’ systems, and rising in settler economies. These contrasts in the evolution of poverty in the late 20th and early 21st centuries, we argue, can only be understood by reference to differences between the settler and peasant export economies, whose roots lie in political decisions taken 100 years previously.

Keywords: Public expenditure; Lewis model; Poverty; Infant mortality; Historical data

Sue Bowden is Director of the Centre for Historical Economics and Related Studies at the University of York, UK.

Paul Mosley is Professor of Economics, Department of Economics, University of Sheffield, UK.

Acknowledgements

Our thanks to Blessing Chiripanhura for his most valuable research support, and also to participants at the Economic History Society conference at Warwick, UK, 1-3 April 2009.

Introduction

The problem of persistent poverty in developing countries has recently attracted considerable attention in the literature, culminating in the announcement of the Millennium Development Goals (MDGs). Yet few recent studies of poverty in developing countries have used a long-term time-perspective. With the exception of the recent papers by Acemoglu *et al.* (2001) and Nunn (2007), nearly all of the research effort on poverty in developing countries has been focused on data from the last 20 years, and on policy initiatives related to those data. In part, this is because the measure of deprivation most commonly used for international comparisons – headcount poverty – has only been recorded since the late 1980s, or in some cases the 1990s. However, if poverty is deeply rooted, and transferred from generation to generation, as much recent literature suggests,¹ any explanation of that poverty needs to find a way of analysing its long-term causes.

In this paper, we attempt to do this, focusing on sub-Saharan Africa. To finesse the problem of short data series on poverty, we use long-period variations in the level of *mortality* – in particular infant mortality below the age of one – as the indicator of deprivation which has to be explained in order to understand long-period changes in wellbeing. This indicator, unlike headcount poverty, is available for many developing countries since the early 20th and in some cases the 19th century. It has its limitations, discussed in detail in Appendix 3 below; but it is available over a much longer historical period, it is well correlated with the ‘World Bank standard’ (headcount) measure of poverty during years when both indicators are available, and it is in some senses a better in-principle measure of human (under) development than the World Bank income measure, because it better captures the health, nutrition and extreme poverty dimensions of deprivation.

Our approach, in common with Acemoglu *et al.* (2001), accepts that the fundamental determinants of underdevelopment and deprivation are institutional and long-term. However, by contrast with Acemoglu *et al.*'s focus on freedom of property rights from expropriation, we take a different view of the process by which poverty is determined, focusing on the politics surrounding the colonial production pattern as the fundamental determinant of long-term poverty trends.

¹ See the recent book by Addison, Hulme and Kanbur (2009), especially the essays by Calvo and Dercon, Harriss and Quisumbing. Awareness of long-term persistence of poverty is of long standing: nearly 40 years ago the World Bank reported that ‘more than a decade of rapid growth in underdeveloped countries has been of little or no benefit to perhaps a third of their population’ (Chenery, 1975: xiii).

Persistence of poverty over long periods has also been observed in industrialised countries, of course, and regions reporting little or no improvement in the living standards of poor people during long periods of growth include Russia during the second half of the 19th century (Gerschenkron, 1959) and of course, Britain during its industrial revolution from 1760 to 1830 (see Crafts, 1997; Feinstein, 1998; and Maddison, 2001).

Our starting-point is that the poorest people, everywhere, are those who have nothing to sell but their labour. Those who hold a claim to any form of productive capital asset (including, for the purposes of this argument, land, skills and social connections, as well as physical capital equipment) will for that reason be above this lowest level (Iliffe, 1987). Hence a production pattern that is pro-poor will be a production pattern that is intensive in low-income labour, and this will be typically be associated with a relatively equal income distribution; incrementally, poverty *reduction* will be associated with investment in poor people's capital, both human and infrastructural.

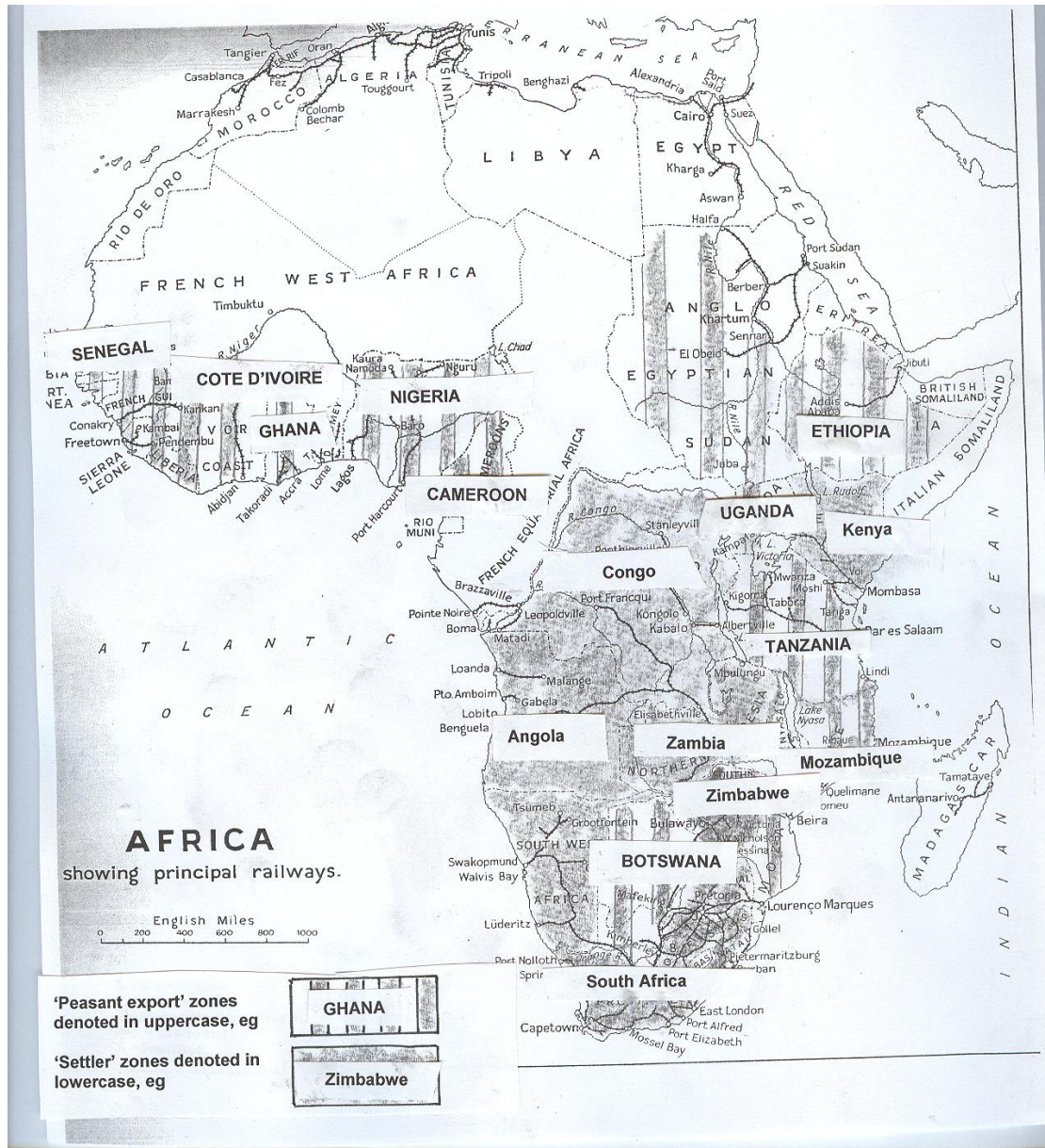
Two important reasons for putting the stress on income distribution are, first, that under an equal income distribution the demand for manufactures (hence productivity) will be greater than under an unequal income distribution, and, second, that the level of inter-group resentment and civil unrest, which depress investment and growth, will be also be less where income is more equally distributed (Murphy *et al.*, 1989; Alesina and Rodrik, 1994; Alesina and Perotti, 1996; Nafziger and Auvinen, 2000). In turn, we see income distribution in developing countries in the 20th century as determined by the political decisions made during the colonial period concerning how to make the colony viable.

Both in Asia and in Africa, it is possible to identify two alternative strategies, labelled by Myint (1976) as the *mine/plantation* (or settler) and the *peasant export* approaches to development, according to whether European agriculturists were or were not legally authorised to own land. We argue that the latter strategy placed in the hands of lower income groups a cluster of assets – not only permanent export crops but also the infrastructure and training required to produce and export them – which were to be important in determining the potential for future poverty reduction processes. For empirical purposes (as illustrated in Figure 1), we take Ghana and Uganda here as being illustrative of the peasant export approach, and Kenya and Zimbabwe as illustrating the settler approach to colonial development.

During the global depression of the 1930s, many observers drew the connection between equality of income distribution and strength of demand in the peasant export economies. One of these, Isher Dass, was an Asian member of the Kenya Legislative Council, who advised European merchants and traders during the debate on the Kenya Land Commission:

not to forget the fact that they cannot possibly thrive so long as the great bulk of the native peasantry remain wage slaves, merely capable of purchasing a little salt and snuff now and then, and a cheap blanket and a small supply of beads once a year. In countries possessing a prosperous native peasantry, such as Uganda and the West Coast of Africa, you can sell, not only salt and cheap

Figure 1. 'Settler' and 'peasant export' economies of Africa, late 1930s



Source: Table 1; map original from Hailey (1938): 1536.

blankets, but motor cycles and motor cars in their thousands, besides dinner suits and dress suits, building materials, footwear, headwear and all the other paraphernalia of modern civilisation.²

² Isher Dass, *Kenya Legislative Council Debates*, 19 October 1934, col 589. See also Archdeacon Owen, in United Kingdom, *Report of the joint committee on closer union in East Africa*, vol II: oral evidence, House of Lords 29 of 1930, p.97, who referred to 'a hum of prosperity on the Uganda side of the border where there is stagnation on the Kenya side'. Especially in times of global recession, trading and manufacturing interests dealing with settler economies were keenly aware that, because of income inequality, they were disadvantaged in relation to peasant-export economies. Further evidence of this same point is provided by a comparison made at the time between the settler economy of Zimbabwe and

In short, poverty, in this view, is caused by unequal access to the means of production, which is perpetuated by policies which preclude the poor from access to them. Our picture of the causal sequence which is crucial in determining poverty dynamics, in relation to that presented by Acemoglu *et al.*, is shown in Figure 2. Our focus in this paper is on the policy decisions, in relation to both early land-settlement and later resource allocation, which, we argue, exerted a definitive impact on the pattern of access to resources and thence on the potential for subsequent poverty reduction.

We develop our argument in three steps. In the next section, Section 1, we examine the experience of Africa over the past hundred years. In the light of that experience, we illustrate the proposition that in those countries which allowed ownership of land by European settlers – by contrast with those countries which did not – a pattern of policy, especially fiscal policy, emerged which was bad at reducing poverty and deprivation. Three components of this policy regime are particularly important – the mix of policy between sectors, the level of investment in the human capital of the poor, and the rate of taxation imposed on the poor, in particular on exports by primary producers. In Section 2 we relate these factors to the trend of real wages and mortality in the selected countries. In Section 3, we test these hypotheses econometrically, and Section 4 concludes.

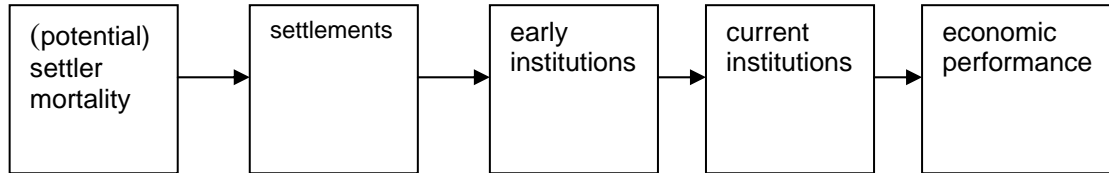
the peasant-export economy of Jamaica, which at that time had the same population and average income as Zimbabwe but much higher black purchasing power:

‘Of the West Indian colonies perhaps Jamaica affords the most interesting comparison. The population of Jamaica, which is 98% coloured and black, is almost the same in numbers as our native population. But the landed cost of imports into Jamaica was something like £4 million, whereas the corresponding figure for this colony was about £1,210,000 which with the addition of local purchases represents a purchasing power of about 30s. per head. Now supposing that only 25% of our native population increased their purchasing power from 30s to 70s per head, the Jamaican level, this would mean an increase in the value of the native trade of at least £500,000 per annum... Surely then, on commercial grounds alone, apart from any moral obligation, it should be the policy to encourage the native in the attainment of higher standards.’

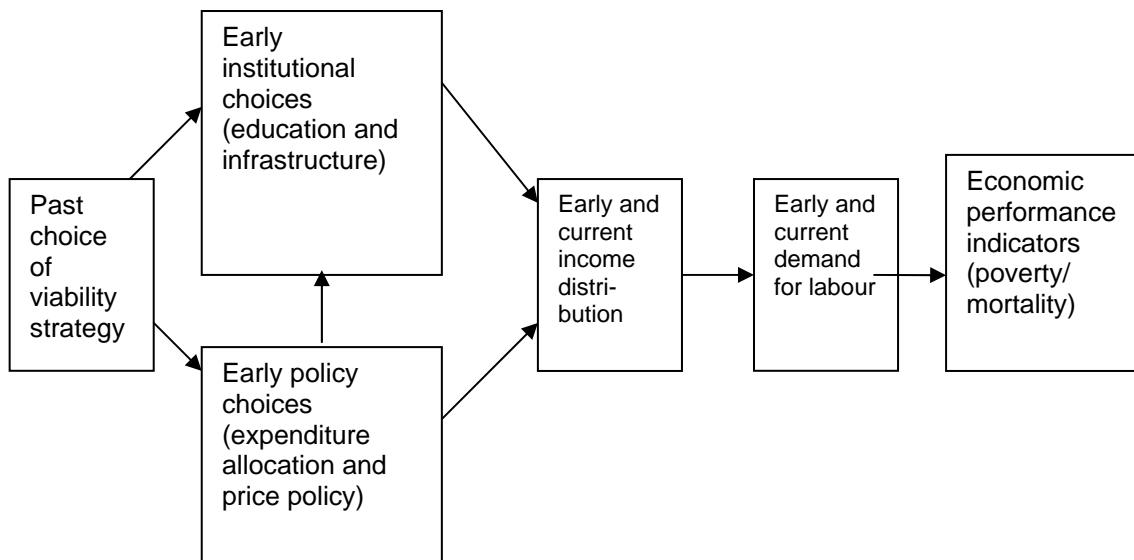
(National Archives of Zimbabwe:S1216/SC1/100/110, memo to Associated Chambers of Commerce, 10 March 1933).

Figure 2. Alternative causal sequences determining the level of poverty and deprivation

(a) Acemoglu *et al.* (2001)



(b) This model



1. Political determinants of settlement and expenditure patterns

1.1 Colonial origins of 'settler' and 'peasant export' economies, 1890-1929

During the final quarter of the 19th century, Africa was divided up between the metropolitan powers, in what became known as the 'Scramble for Africa'. This process and its economic and political rationale have been much debated (Gallagher and Robinson, 1958; Cain and Hopkins, 1987; Offer, 1993). What is, however, not in question is that any country, once colonised, needed a strategy to minimise the net cost which it imposed on the metropolitan country. The focus of this inquiry is on the implications of the two contrasted strategies which were employed in Africa to achieve this.

We described these strategies above, following Myint (1976), as *settler-* and *peasant export-*based economic strategies. Settler economies (such as in Africa, South Africa, Zimbabwe, Kenya, Zambia, Angola and DRC Congo) are those in which the chosen strategy was to allow agricultural land to be appropriated by European settlers, who often found themselves operating in competition with indigenous farmers. Peasant export economies (such as Ghana, Uganda, Rwanda, Mali, Senegal, Togo and Cameroon) are those in which Europeans were not allowed to own land, and where agricultural production and exports were in the hands of indigenous African smallholders.³ A division of African economies between the 'settler' and the 'peasant export' type, as of the mid-1930s, at which point the key differences in economic structure had fully emerged, is shown in Table 1.⁴ As can be seen from the table, in the settler economies – and there only – the control of expatriates over land quickly translated itself into control over the apparatus of government, including over the allocation of public resources between rich and poor recipients.

1.2 Access by low-income groups to public capital goods

From these differences in policy-making structures, there emerged an important difference in resource allocation. Low-income Africans had better access to public capital goods, both physical and human, in peasant export than in settler economies, and also a pattern of recurrent expenditure, which was more pro-poor. The political rationale for this lay partly with the metropolitan countries, because all of them were under pressure to develop the export base of the colonies as a defence against the erosion of market share which they were already beginning to encounter in world markets. Whereas in the settler economies they could expect the capital provided by European settlers to finance the necessary infrastructural investments to make those exports viable, they could not, because of the prior decision not to allow European settlement, finance the investments required to make the Ugandan cotton industry or the Ghanaian cocoa industry viable in the same manner. And at the local level, in the peasant export economies – unlike the settler economies – a voice was given to African chiefs and other regional-level authorities (Table 1). From the 1920s onward, they came increasingly to demand their proper share of resources for roads,

³ Myint's ideal types extend across the whole developing world, and are not confined to Africa. For a discussion of 'settler' economies, see Denoon (1983) and Mosley (1983). Discussion of peasant export economies is rather more country-specific, but see, for Uganda, Joergensen (1981), and for Ghana, Kimble (1963).

⁴ The criterion for being a 'settler' economy is that five percent or more of the total land area was *reserved* for Europeans in 1920. During the first years of the 20th century, when the colonial state did not control the entire country, the criterion is ambiguous, because it was common in some African countries for Europeans to settle land on their own initiative without having any formal title to it.

Table 1. African countries: 'settler' and 'peasant export' economies, circa 1938

Settler:	Share of land alienated or reserved for Europeans %	Elective representation of non-Africans on legislative body	Peasant export:	Share of land alienated or reserved for Europeans %	Elective representation of non-Africans on legislative body
South Africa	87	92 (Note 1)	Ghana	0	36 (Note 3)
Zimbabwe (Southern Rhodesia)	49	100 (Note 2)	Uganda	0	0 (Note 4)
Zambia (Northern Rhodesia)	3	92	Tanganyika	0	0 (Note 5)
Kenya	7	72	Nigeria	0	0 (direct elections at municipal, not federal level; elsewhere, indirect rule through native authorities)
Angola	12	76	Mali	0	na
Congo DRC (Belgian Congo)	9	80	Upper Volta (Burkina Faso)	0	na
Swaziland	65	na	Rwanda	1	0 (no direct elections, chiefs exercising quasi-feudal authority)
			Mozambique	3	0

Sources: extended and adapted from Mosley (1983), Table 1.1., using, in particular, data from Hailey (1938). 'na' = not available.

Notes:

1. In Transkei, four African representatives, chosen either by election or by chiefs' nomination. In all other states, representation of Africans vested in Governor-General.

2. Representation of Africans in legislative assembly by appointment through Minister of Native Affairs, not by election.

3. Proportion of elected European members fixed by 1928 constitution. After 1958, no elected European members.

4. No direct elections to Uganda legislative assembly; members nominated by chiefs at county level.

5. No direct elections; indirect rule through native authorities.

education, health, and other inputs required to raise the productivity of the poor.⁵ By the end of the 1920s, this difference in governance patterns had, as we saw above, driven a wedge between the productive potential of the African poor and lower-middle income groups in peasant-export economies, in contrast to settler economies. We may examine the working of this process first in relation to capital expenditures. The pace of infrastructure building quickened in the 1920s, and by 1925, several hundreds of thousands of low-income Ghanaians and Ugandans had a connection to the railway line within immediate reach, whereas black rural South Africans, Zimbabweans and (with the exception of one line) Kenyans had no access to rail transport.⁶ This differential pattern of provision applied not only to physical capital, but also to what a later World Bank report on poverty (World Bank, 1990) was to refer to as 'investment in the human capital of the poor'. Even by the Second World War, no university or institution of higher education offering access to black students existed in any part of Kenya, Zimbabwe or South Africa; but Ghana had Achimota, founded in 1920, and Uganda had Makerere, founded in 1922, which through the 1930s and 1940s took in students from other African countries without a university, including Kenya, Tanganyika and Zanzibar.⁷

At the secondary level, Ghana and Uganda had enrolment levels many times higher than those prevailing in the settler economies (Table 2). This not only made a direct contribution to equalising their income distributions, but also enabled Ghanaian and

⁵ These political pressures and their economic consequences are eloquently discussed by Kimble (1963) in Ghana and by Jorgensen (1981) in Uganda. The terms of trade, and thus the living standards of the poor in particular, declined severely during the 1914-1918 war (see Table A1 below) and a joint meeting of the chiefs complained in March 1918 that: 'While the Gold Coast produce is taken for almost nothing...the prices of European goods have reached such a prohibitive height that one feels most unhappy'; they further threatened that, 'if no official action were taken, 'they would have to do something to guard against such manifest exploitation of the natives' poor resources' and indeed three years later, in 1921, an association was formed which forbade anyone to sell their cocoa at a price lower than 15s. a head. This was the first organised attempt to stop cocoa sales (Ghana National Archives: SNA692, Case33/1918, Memorandum 5 March 1918 to Governor, quoted in Kimble, 1963: 49-50.) In Uganda there were also pressures from the chiefs to provide compensation for people's sufferings during the wartime period, against which the small population of white settler-producers remaining in Uganda put up some resistance: for these pressures and the colonial government's response to these in the 1920s, see Jorgensen, 1981: 161-165.

⁶ Locations of railways in 1938 are illustrated in Figure 1. By that year Ghana had 550 miles of railway track running through African smallholder areas and Uganda had 350 miles; Kenya had only the 120 miles of the Nairobi- Nanyuki branch line, which ran partly through European and partly through African areas; and Zimbabwe had none, as none of its railway lines ran through African reserves. Railways made a colossal difference to the costs and thus the competitiveness of African producers (the first railway in Ghana, built between 1898 and 1904, enabled a 60lb. headload to be transported at a cost of 4s. instead of 26s.6d., in three days instead of eight: Kimble, 1963: 30). In effect, railways moved anyone within their reach out of the subsistence economy into the cash economy.

⁷ Both Achimota and Makerere Colleges, during the interwar period, awarded their students external degrees of the University of London. They were not granted their own degree-awarding powers until after the Second World War. For the detail of the visionary health and education reforms implemented by Guggisberg in the 1920s, see Wraith, 1967: chapters 5-6.

Ugandan Africans to unlock the gateway to the higher reaches of the civil service. Jorgenson argues, in the case of Uganda,

access to education rather than ownership of land became the passport to administrative cadres in Uganda from the 1930s onward, although it was agricultural surpluses which were the key to obtaining school fees for one's children. (Jorgensen, 1981:165)

Even at the primary level of education, which impacts more directly on the poverty reduction process, investment in education was much stronger in the peasant-export than in the settler economies, and integrally related with the growth of peasant exports. As Hurd relates for the case of Ghana,

A crucial factor bringing about social change was the spread, in the 1920s and 30s, of cocoa farming into Ashanti from the Akwapim area [nearer the coast]. The significant factor about cocoa farming was that although it was still carried out on the basis of peasant farms, it represents a change to a cash-crop economy from the earlier forms of subsistence agriculture. It was only after...[the involvement of South Ashanti in the cash-crop economy] that the rate of educational expansion quickened, so that cocoa farming may be said to have performed the same function in South Ashanti as the expansion of trade had earlier performed for the colony. (G.E. Hurd, 'Education', chapter 6 in Birmingham *et al.*, 1962)

Table 2. Educational provision and enrolments in selected African countries, 1900-1960

	Settler economies						Peasant export economies					
	Zimbabwe			Kenya			Ghana			Uganda		
	Tertiary (university) level	Secondary level	Primary level	Tertiary (university) level	Secondary level	Primary level	Tertiary (university) level	Secondary level	Primary level	Tertiary (university) level	Secondary level	Primary level
1910	0	0		0	0		0		12,136	0		
1920	0	0		0	0		0	207	28,580	0		
1926	0	0	77,610	0		80,881			32,827	108		
1930	0	0	108,752	0	392		90	601	53,000 (1.8%)	107		
1938	0	120		0	430	82,105 (2.5%)	180			180	248	309,387 (8.1%)
1940	0	160		0	450		300	2,635	88,000 (2.7%)			
1950	250	255	232,689	0	560	225,000	600	6,162	154,400 (3.7%)	250		
1960	600		484,299						701,000 (10.4%)			

Sources: Zimbabwe: *Yearbook of the Colony of Southern Rhodesia*, successive issues. Kenya, Ghana and Uganda: *Blue Books* and *Educational Reports*, various issues.

This differential impetus derived not only from the political forces described above, but also from the vision and ‘social entrepreneurship’, as we would now call it, of specific individuals. In the Ghana of the 1920s, a visionary governor, Gordon Guggisberg, implanted his vision of infrastructure-led development focused on the African population into the government’s development budget. The result of this was not only showpiece tertiary institutions, such as Achimota, and ‘the finest hospital of the time’ (Wraith, 1967:4) at Korle Bu, Accra, but also an infrastructure of primary, secondary and technical health and educational institutions. As we shall see, this was able by the 1920s to push mortality rates well below the levels prevailing in settler economies. It is very clear that, as in Anne Booth’s account of south-east Asia at the same time (2007), what was being constructed in this kind of colonial economy was not at all a ‘nightwatchman state’, restricted to the provision of security functions, but rather a state capable of purposive, and indeed progressive, developmental interventions.⁸

We now examine the pattern of recurrent expenditures, which also (Hudson *et al.*, 2009) have the political function of signalling the interest groups with which government was aligned. In the peasant export economies, much more than in the settler economies, the government shifted over the course of the 1920s from an expenditure pattern oriented towards security and ‘coercive’ expenditures, towards an expenditure pattern orientated towards pro-poor developmental activities for the benefit of the African majority – in particular, education, health and smallholder agriculture. In Table 3 below, we show that the share of public expenditure attached to these ‘poverty-reducing’ functions was, from the 1920s onward, higher in the peasant export than in the settler economies. We refer to this share henceforward as *pro-poor expenditure*. In Table 3 we delineate pro-poor expenditure in two different forms: as the share of pro-poor functions (health, education and agriculture) in GNP; and as this share net of ‘coercive’ (military, police and prisons) expenditure, which may be seen as deducting from potential pro-poor impact, both because military expenditure is more capital- and import-intensive than agricultural and human capital production, and because military expenditure is associated with civil disturbance, which is disruptive of development.⁹

⁸ We mean the phrase ‘progressive’ not only in the sense of investing in primary health and education, but also in the sense of investment biased towards the poorer regions of the peasant export colonies. Guggisberg ‘was accused, and cheerfully accepted the accusation, of being a fanatic about the Northern Territories’ (the poorest region of Ghana, treated by previous administrations more as a labour reserve than as a terrain for development). (See Wraith, 1967: 112,156.)

⁹ For the origins of the concept of pro-poor expenditure, see Mosley *et al.*, 2004, especially Appendix 1, which provides evidence in support of the idea that agriculture, education and social services have a relatively high propensity to impact on the livelihoods of the poor. The concept of ‘coercion’ is due to Jorgensen, 1981.

Table 3. Comparative evolution of selected 'settler' and 'peasant export' economies, 1911-2006

	'Settler economies'								'Settler economies' (average 1+2)				'Peasant export economies'								Peasant export economies (average 3+4)			
	(1)Zimbabwe				(2)Kenya				(3)Uganda				(4)Ghana											
	M	W	AS	PP EC	M	W	AS	PP EC	M	W	AS	PP EC	M	W	AS	PP EC	M	W	AS	PP EC	M	W	AS	PP EC
1911-20	225	73	0.10	4.5		100	0.0 6	3.8		86	0.0 8	4.2		77	0.3 9	- 3.6	29 5	84	2.6 7	- 0.4		81	1.53	- 2.0
1921-30	246	69	0.12	8.9	400	80	0.0 8	10. 1	309	84	0.1 0	9.5	24 5	11 7	0.9 1	7.9	20 6	13 9	3.8 9	14. 2	22 7	12 9	2.36	11. 8
1931-40	267	88	0.09	9.8	287	76	0.0 7	9.8	285	84	0.0 8	9.8	17 1	20 9	1.1 9	14. 4	11 0	14 8	2.2 8	18. 9	13 6	17 8	1.54	14. 3
1941-50	264	88	0.22	14. 2	182	87	0.2 4	10. 4	223	88	0.2 3	12. 3	12 6	14 6	1.2 6	13. 8	10 6	15 0	3.3 0	18. 7	11 5	14 8	2.28	16. 2
1951-60	178	11 2	0.44	18. 4	145	109	0.7 2	11. 7	161	11 0	1.0 1	15. 0	12 6	28 5	5.8 4	22. 7	11 5	17 2	6.5 2	18. 7	12 0	22 8	6.18	16. 8
1961-70	161	14 8	0.73	16. 9	120	130	2.1 4	9.4	143	14 5	1.3 2	13. 2	10 4	54 1	6.6 8		12 0	26 7	9.8 4	29. 0	11 2	40 4	8.41	21. 1

Sources for Table 3 (all data presented are 10-year arithmetic mean values of the variable stated):

Mortality indicator (M): Infant mortality rate, that is mortality rate per thousand of those below one year of age: principally from World Bank, *World Development Indicators*, and from Kuczynski (1949), supplemented by sources listed in Appendix below.

Real wage indicator (W) 1914=100 in all cases. Data from Appendix 1.

Agricultural sales (AS) are agricultural sales of African origin per head of African population, derived from *Blue Books* and *Annual Trade Reports* of the countries specified. These are defined as sales within the following countries: *Zimbabwe*: maize, 'small grains' (finger and bulrush millet), groundnuts, cotton, smallholder tobacco, fruits, vegetables. *Kenya*: maize, smallholder coffee, smallholder tea, smallholder pyrethrum, fruits, vegetables. *Kenya*: maize, smallholder coffee, smallholder tea, smallholder pyrethrum, fruits, vegetables, sugar. *Ghana*: maize, cocoa and derivatives, kolanuts, fruits, vegetables, sugar.

Pro-poor expenditure (PPE): combined share of agriculture, health and education in GDP, from *Blue Books*, and after 1970 from IMF *Government Finance Statistics Yearbook*.

Pro-poor expenditure less coercion (PPE-C): combined share of agriculture, health and education, less share of 'coercion' (military, police and prisons expenditure) in GDP, from *Blue Books*, and after 1970 from IMF *Government Finance Statistics Yearbook*.

1.3 Production technologies and 'poverty externalities'

The result of these differences in political structure, and consequently in expenditure allocations, was to produce a difference in the production functions of the two groups of economies, and in particular in the pro-poor impetus attaching to each of these groups.¹⁰ As was first illustrated by Baldwin (1963), whether or not the law of one price holds, there is certainly no law of one technology. Within developing countries, different sectors differ enormously in their input requirements per unit of output, and thence in their ability to reduce poverty. Particularly crucial is whether leading (fast-growing) sectors are intensive in the use of resources which can be supplied by the poor; and this means in the first instance labour, because the poorest people in the poorest countries have little else to sell (World Bank, 2000; Narayan, Rademacher and Koch-Schulte, 2000).

¹⁰ This is also illustrated by Booth (2007) in south-east Asia, see her Tables 5 and 6.

As a broad generalisation, growth in which the leading sector is (among non-traded goods) construction and services and, above all, smallholder agriculture is pro-poor (partly through its demands for low-income labour, but also by achieving a reduction in the price of foods consumed by the poor); whereas economies in which the dominant sectors are capital-intensive (such as, in most economies, oil and gas production, mineral production, or military expenditure) have many fewer pro-poor production functions.¹¹ And peasant export economies, because their politics did not restrict the development of smallholder agriculture and other pro-poor activities,¹² were more effective than settler economies at stimulating activities whose benefits either were directly aimed at, or spilled over on to, poor people. We refer to the latter as *poverty externalities*.¹³ Because Ghanaian cocoa and Ugandan coffee and cotton were highly labour-intensive, they were very effective at generating poverty externalities. These were mostly in the shape of wages paid to people employed in export enclaves, or to the small number of people employed in linkage activities – such as cotton ginning or cocoa processing – attached to those production sectors.

¹¹ In respect of smallholder and plantation agricultural activities, Baldwin quotes labour utilisation coefficients of 6.0 per \$1,000 of output for the tea industry of Ceylon (Sri Lanka) for the 1960s, 2.1 in the Cuban sugar growing industry, 3.5 in the rubber industry of West Africa, and 2.6 in the rubber industry of Malaya; by contrast, coefficients for mineral and extractive industries are much lower: 0.033 and 0.026 for the oil industry in Venezuela and Saudi Arabia, respectively; 0.08 for bauxite production in Guyana; 0.13 for the Zambian copper industry; and 0.31 for iron ore production in India. All these examples are from Baldwin, 1963:82, note 1. For a long-period discussion of factor proportions in the economic history of Africa, see also the essay by Austin (2008a).

¹² At its peak in 1927, Ghanaian cocoa accounted for over 40 percent of world output; and over 70 percent of all Ghanaian exports consisted of (mainly smallholder) exports of cocoa. Gold Coast, *Blue Book* 1927.

¹³ The poverty elasticity or ‘marginal propensity to reduce poverty per unit of growth’, $d \log P/d \log Y$, may be characterised as:

$$d \log P/d \log Y = \frac{\partial \log P}{\partial \log(e_i A_i(\sigma)/Y)} \cdot \frac{\partial \log(e_i A_i(\sigma)/Y)}{\partial \log Y} \quad (2)$$

where, as before,

P is poverty and
Y is income,

and also:

σ is a measure of vertical inequality of income distribution (e.g. Gini coefficient);
 A_i is the leverage (share in output) of any sector i within the economy;
 e_i is a measure of the ‘poverty externalities’ provided by that sector (the propensity to reduce poverty attached to each of the sectors A_i).

It will be clear that the higher is the level of poverty externalities e_i , the higher is the overall poverty elasticity.

2. Real wages, quality of life and the Lewis growth model in the two systems

2.1 Real wage and mortality data

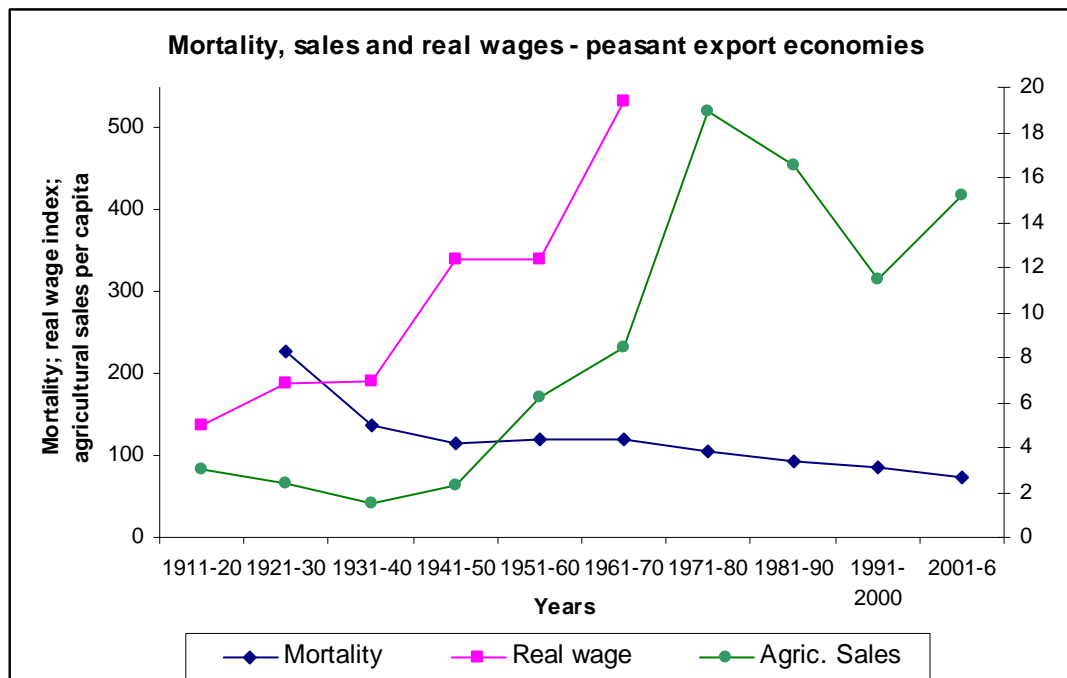
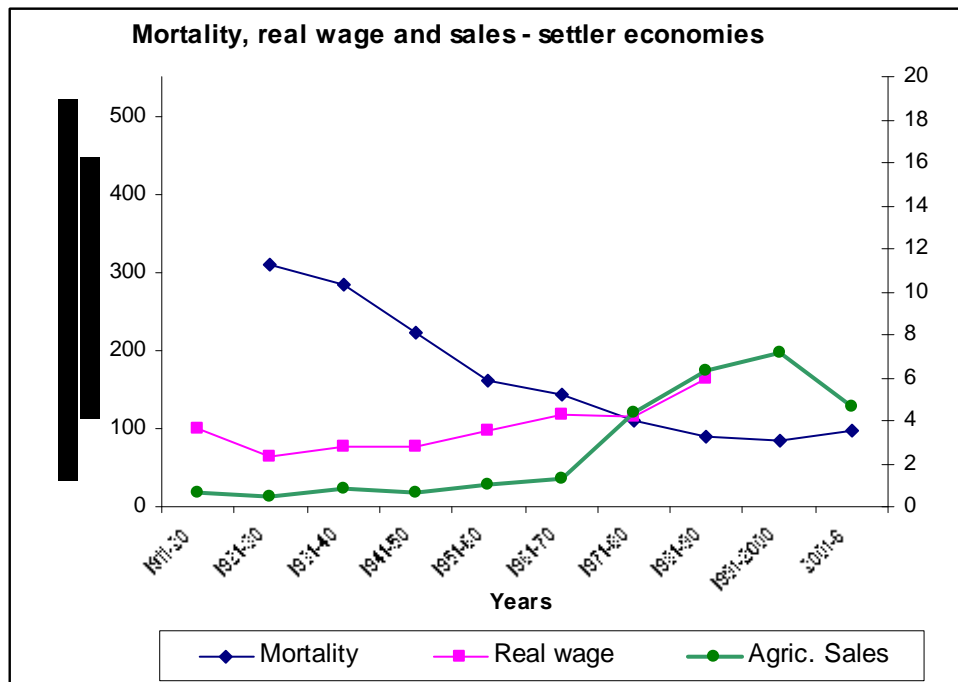
Different political power structures, as we have illustrated, produced different allocations of capital assets to the poor in colonial times. We now seek to trace through the implications of these differences in allocation patterns for long-period trends in living standards and poverty rates. Our template will be the Lewis model (Lewis, 1954) of economic development with unlimited supplies of labour, itself inspired by evidence of near-subsistence wage rates throughout the Industrial Revolution period in Britain (1760-1840).¹⁴ The Lewis model has already served as inspiration for a number of long-period empirical studies of real wage rates in the developing countries of Africa, Asia and the Caribbean (Eisner, 1961, for Jamaica; Arrighi, 1970, for Zimbabwe; Wilson, 1972, for South Africa; Huff and Caggiano, 2007, for Burma, Thailand and Malaya). The fundamental premise of the Lewis model is that, so long as there is surplus labour in the 'traditional sector' – those production activities which do not use reproducible capital – the supply curve of labour to the other sectors of the economy is flat. As a consequence, the real wage and the standard of living are pegged down to near-subsistence levels, regardless of productivity, for as long as the labour surplus persists. In all the examples quoted above, the real wage does not rise from its near-subsistence floor until at least the end of the Second World War, which is treated by the authors mentioned as an outcome consistent with the predictions of the Lewis model.

In the context of these estimates, we can now present our own estimates (Figure 3) of long-term real wage trends through the same period.¹⁵ These suggest that real wages remained tied close to the subsistence level in the settler economies of Kenya and Zimbabwe for nearly the entire 20th century (with occasional ephemeral surges during macro-economic boom periods), but rose above that level in the peasant export economies of Uganda and Ghana as early as the 1920s. In spite of relapses in the 1940s and 1970s in both countries, they never, during the second half of the 20th century, fell back to the 'settler' level. Moreover, there appears to be a strong link from real wages to infant mortality, our selected indicator of poverty. A sustained fall in the infant death rate began, on the evidence available to us, in Ghana in the

¹⁴ At the time Lewis wrote, in the 1950s, the main evidence available to him was the three-volume study by J. L. and Barbara Hammond (1911-19), together with the data gathered by Deane and Cole, eventually published as Deane and Cole (1964), both of which suggested that real wages in Great Britain had a tendency to be stagnant or near-stagnant during the Industrial Revolution period, 1760-1840. Subsequent research on this period (Horrell and Humphries, 1992; Crafts, 1997; and Feinstein, 1998) has used a wider range of sources and indicators of wellbeing than that available to Lewis, but much of this literature supports his initial intuition that the Industrial Revolution period was characterised by stagnant real wages, made possible, as in developing countries, by 'disguised unemployment' within subsistence activities in the service, agricultural and home-working sectors.

¹⁵ Full data series and notes on methods of calculation of our real-wage index are in the Appendix.

Figure 3. The settler-peasant export dichotomy: mortality, real wages and smallholder sales



early 1920s, in Uganda 10 years later, but in the settler economies not until 20 years after that, in the 1950s .

How can these trends in real wages and in living standards be explained, either in terms of the 'poverty externalities' story of Section 2 or otherwise?

First we must fit into the story an explanation much emphasised by Lewis. Lewis was always at pains to stress that the flat segment of his 'unlimited supplies of labour' model did not apply to all developing countries, but only to labour-surplus countries. From this category he excluded the majority of African countries, and quite explicitly the case of Ghana, a country which he came to know well in the 1950s as adviser,¹⁶ and which in his view was characterised by 'an abundance of land *and an acute shortage of labour*'¹⁷. Another possibility considered by Lewis was that the cost of labour might be pushed up by shortage of suitable land for export crop production. In relation to Ghana, he argued that 'mineral-bearing lands, or lands with just the right suitability for cocoa, are relatively scarce...if these scarce lands are owned by peasants, the peasants may of course become rich' (Lewis, 1954:443). In a modest way, this also occurred in the 1920s as the smallholder production frontier was extended, not only with respect to Ghanaian cocoa, but also with respect to Ugandan cotton, where:

Migrants from Toro and Ankole¹⁸ in 1922 were responsible for producing at least a quarter of the Buganda cotton crop, and the problem of transporting the pickings to metalled roads would have been 'almost insoluble' without their assistance. In Eastern Province, in the two most important cotton-growing districts, Teso and Busoga, an average of over 60 shillings per head¹⁹ had been paid out to the adult male population...The successful cotton harvest sent up the market rate for unskilled labour in Jinja by nearly 100 per cent²⁰.

2.2 'Creation' of surplus labour by policy – the 1930s and 1940s

Thus, for a combination of reasons – labour shortage, land shortage, and a pro-poor allocation of recurrent and capital expenditure – by the end of the 1920s a floor was placed under the labour supply curve in the peasant-export, but not in the settler economies (see Figure 4).

With a broadening of African labour-market opportunities and increases in the social wage received by many Africans at this time (Table 3), this translated first in Ghana in the 1920s (Kuczynski, 1949, vol. 1:523), then 10 years later in Uganda, into a reduction in the African mortality rate. During the 1930s, in spite of a collapse of world cocoa and coffee prices, there was only a small reduction in the supply of Ghanaian and Ugandan primary exports (Table 3) and thus in producer incomes.

¹⁶ For this period of Lewis' career, see Tignor, 2005: chapters 5 and 6.

¹⁷ Lewis, 1952: paragraph 28. Emphasis added.

¹⁹ About four times the 1914 real wage: see Table 2 below.

²⁰ Uganda National Archives, Entebbe: Entebbe Secretariat Archive, SMP 5711(O.S.)/139. Cited in Powesland, 1957: 38.

the late 1930s and after the Second World War, buyers' commercial interest in keeping the buying price as low as they could manage merged with the fiscal interest of the colonial administration.

Between them, these interests established their own form of commodity control, in the form of boards such as the Ghana Cocoa Marketing Board and the Uganda Coffee Marketing Board, and Cotton Lint and Seed Marketing Boards, across all of the peasant export economies. As illustrated in Table 4, these marketing boards derived public revenue from paying the (African) smallholder producer less, often a good deal less, than the export realisation (Bates, 1981:137-145; Joergensen, 1981: Appendix Table A3). The name 'marketing boards', in this context, was simply a euphemism for taxes on African smallholder exports. Their importance for our present argument is that what they were taxing was in large part the motor by which poverty had previously been brought down in the peasant export economies.

Table 4. Settler and peasant export economies: prices paid to farmers as a share of export realisation, 1920-2007

	Settler economies			Peasant export economies		
	Zimbabwe (maize)	Kenya (maize)	Average, settler economies	Uganda (coffee)	Ghana (cocoa)	Average, peasant export economies
1911-20	0.91			0.62	0.70	0.66
1921-30	0.87	0.63	0.42	0.69	0.73	0.71
1931-40	0.82	0.57	0.69	0.31	0.47	0.39
1951-60	0.76	0.58	0.64	0.30	0.52	0.41
1961-70	0.69	0.89	0.79	0.18	0.61	0.39
1981-90	0.67	0.79	0.73	0.28	0.36	0.32
1991-2000	0.80	0.81	0.81	0.77	0.55	0.66
2000-present				1.00	0.74	0.87

Sources: Uganda to 1978: *Annual Trade Reports*; after 1978: Figure 3.8, 'Development of Producer Prices in Uganda', in Akiyama (2001). Ghana, to 1978: *Annual Trade Reports*; after 1978: Figure 2.6, 'Cocoa producer prices in West Africa', in Varangis and Schreiber (2001); Kenya and Zimbabwe: 1960 and before, from Mosley (1983), chapter 3; thereafter from World Bank World Development Indicators.

This taxation of smallholder agriculture, with its huge poverty reduction potential, might have been expected to close the gap in poverty reduction performance between the peasant export economies and the settler economies,²² and duly did so

²² The governments of settler economies, by contrast with peasant export economies, had an interest in keeping the price of controlled commodities as high as possible, in order to support the European farmers to whom they were beholden. Through most of the post-war period (Table 4), because power was in the hands of agricultural producers rather than agricultural

(Table 3 above). During the period of smallholder commodity marketing boards, from the 1940s through to the early 1980s, the ability of peasant export sectors to grow, and therefore to reduce poverty, was heavily compromised by the burden of export taxation.

At the end of the Second World War, the pattern of expenditure was influenced, both in the settler and in the peasant-export colonies, by investments in secondary and higher education, and in industry, in pursuit of economic independence and in rather modest imitation of the import-substituting industrialisation being attempted at the time in Asia and Latin America.²³ Much of this investment was financed out of the proceeds of the levies on smallholder export production, summarised in Table 4. This evolution in expenditure patterns occurred at a similar rate in the settler and the peasant-export colonies, and thus the 'performance gap' between the two groups of colonies in terms of pro-poor expenditure does not widen as it did in the 1920s and 1930s, but rather remains constant between the 1940s and 1960s.

2.3 Decolonisation, structural adjustment and the emergence of the 'governance state', 1960-2007

Following the lead of Ghana in 1955, most African countries, both of the settler and peasant export type, became politically independent during the 1960s and 1970s. In all cases, they received large infusions of concessional aid from both bilateral and the newly-established multilateral donors at the point of independence, and in most cases for decades afterwards. Africa has long been the most aid-dependent continent, as well as the poorest,²⁴ and in all the cases under examination the resources provided by aid donors have been crucial in influencing the balance of forces determining the rate of poverty reduction.

The post-Second War international economic order, established at Bretton Woods in 1944 as a framework for global stability and growth after the international turbulence of the interwar period, provides for a gradual liberalisation, under the auspices of the General Agreement on Tariffs and Trade (GATT; now the World Trade Organisation), of the high levels of protectionism prevailing during that period – of which, in Africa, controls on commodity marketing such as those summarised in Table 4 were an important component. This liberalisation was to be accompanied under the Bretton Woods system, when required, by short-term emergency finance from the IMF, and on a more sustained basis by long-term credits from the World Bank and bilateral donors.

consumers, they were able to keep the price of board-controlled commodities above the export realisation.

²³ For Ghana, these attempts at import-substituting industrialisation are particularly well summarised by Killick (1978).

²⁴ See, for example, World Bank (1998).

Both in Africa and in other developing regions, support of the latter type, throughout the 1960s and 1970s, principally took the form of project lending for infrastructure, including educational and health infrastructure. The liberalisation provided for under the General Agreement on Tariffs and Trade (GATT) was scarcely implemented at this time, and controls on exchange rates, prices and food subsidies were maintained in position in most countries. This approach, it has been alleged, inflicted severe economic costs on developing countries, in terms of competitiveness foregone (Little *et al.*, 1977); but, as demonstrated by Bates (1981), enormous political benefits in the context of fragile political systems. For, in the context of the project mode which had become established as the norm, this mode offered highly visible selective benefits to specific client groups, at the expense of collective deprivations, such as export taxes (Table 4 above) and overvalued exchange rates. The 'project mode' of supporting agricultural development was therefore, in the long term, economically ruinous but politically highly rational.

At first, through the 1960s and 1970s, the approach was successful in raising investment and growth rates across most of Africa, and specifically, through high levels of investment in health and education, in lowering child and adult mortality (Table 3 above). But, by the end of the 1970s, agricultural production per capita was falling across Africa as a whole, and food imports were rising (Bates, 1981:1). And, across Africa as a whole, but specifically in our four case-study economies, transcending the settler-peasant export divide, there were severe governance problems.

These were of two kinds. The first was a chronic fiscal debility, which prevented African governments, even through the relatively fat years of the 1970s, from maintaining a sustained investment in the kind of 'green revolution' programmes which had revolutionised smallholder agricultural productivity across Asia (and pushed up the 'Lewis supply curve') in the same decade. The second was a wave of political violence and instability, at its most dramatic in Uganda, where the savagery and dispossession associated with the rule of Idi Amin caused per capita incomes in Uganda to fall by 40 percent between 1970 and 1987 (Reinikka and Collier, 2001). But the by now highly controlled peasant export economy of Ghana also experienced instability of government, imposition of exchange rate controls and widespread decapitalisation during the 1970s (Toye, 1995); Zimbabwe had become embroiled in a decade-long guerrilla war against the breakaway white regime; and in Kenya, at this time one of the fastest-growing of African economies, an Assistant Minister, J. M. Kariuki, had been found dead in a ditch a few days after suggesting in public that inequality in post-colonial Kenya had grown to the point that it had become 'a society of ten millionaires and ten million beggars'.²⁵

²⁵ This episode is described by Leys (1975). The 'ten millionaires' in this metaphor were the members of the immediate family of the President, Jomo Kenyatta, all of whom derived substantial rents from ownership of large farms, public corporations and other assets of the Kenyan economy.

Common threads running through each of these cases were: the continuing weakness and lack of legitimacy of the post-colonial governmental apparatus; resentment at the size and the injustice of the gap between rich (often white) and poor (almost invariably black); and a widening of this gap (especially in the peasant export economies) caused by corrupt utilisation of commodity stabilisation funds and other surpluses created by government patronage. As a consequence of this, the pro-poor expenditure ratio (Table 3) suffered in the 1970s, *both* in the peasant-export and in the settler economies. Africa, having ended the 1970s with its governance apparatus severely damaged, duly suffered more than any other region of the developing world.

Within the Bretton Woods international financial system, there was a major re-alignment of responsibilities, as the World Bank pressed for, and achieved, an expanded role within the task of repairing this damage. By the end of the 1980s, a large-scale shift in the Bank's portfolio had occurred, away from the long-term project lending provided for in its 1944 articles of agreement, and towards long-term programme lending ('structural adjustment lending'²⁶) conditioned on liberalisation of the economy. Government control over the economy had come to be seen by the international financial organisations (e.g. World Bank, 1981) as the root of African economic, and specifically agricultural, weakness. As the depression deepened, those organisations determined to exact liberalisation of the economy as the price of their financial support. During the 1980s, these demands for liberalisation principally took the form of requests for the decontrol of exchange rates, agricultural prices, import tariffs and perhaps most urgent of all, removal of export taxation – including, of course, the 'price stabilisation funds' of the peasant export economies. But by the middle of the 1990s, these demands had expanded to embrace governance reforms of a broader nature, designed to repair the weakness of the African state – now seen as the fundamental reason for the continent's marginalisation.

If the structural adjustment prescription, as applied to all African economies, was broadly the same, the response was massively different. In particular, in respect of our sample, the two peasant export economies grew rapidly, and reduced poverty even more rapidly, during the 1990s and early 2000s (Table 3), and on a dramatic scale. The headcount poverty rate in Ghana fell from 51 percent to 39 percent during the 1990s, and then to 27 percent by 2005 (Nsawah-Nuamah *et al.*, 2010: 1), and in Uganda it fell over the same years from 54 percent to 32 percent – a transition rivalling any achieved in any country, even in East Asia, over a similar period. In the

²⁶ 'Structural adjustment', in this context, meant policies (principally measures which liberalised the markets for crops, foreign exchange, and capital, and thereby facilitated an opening-up of the economy) which changed the structure of incentives, and thereby were able to boost the economy's supply side – by contrast with demand-side measures, which restricted demand and therefore reduced output. By means of these policies, the Bank hoped to be able to give an expansionary impetus to the economy, to contrast with the deflationary bias of the IMF's advice and policies. This boost eventually happened – but in Africa it took many years, most of the 1980s and 1990s in fact, to materialise (Mosley, Sabasat and Weeks, 1995, etc.).

settler economies, by contrast, poverty, in a headcount sense, increased on a long-term basis over the same years.

Even more importantly for the long term, there was a bifurcation in institutional capacity: tax-to-GDP ratios increased quite sharply in Uganda and Ghana in the 1990s, but fell in the settler economies. We have already reviewed a number of the drivers which explain why this bifurcation happened. The first and most crucial factor was that as previously discussed the peasant export economies possessed, and the settler economies did not possess, a stock of labour-intensive assets available to be liberalised. When, through the course of the early 1990s, Ghana increased from 35 percent to over 70 percent the share of the export price of cocoa received by the producer (Table 4 above), and when Uganda increased by an even greater proportion the share of the coffee price received by the farmer, they were not only transferring around 10 percent of GDP out of government hands, but transferring it to an extremely wide, and predominantly smallholder-based, constituency (incomes of about 85 percent of Ugandans were affected by what happens to coffee revenues, according to Reinikka and Collier, 2001²⁷). To be sure, there was privatisation of assets going on at the same time in the settler economies, but nothing which spread the resulting wealth nearly so broadly. This sudden positive shock, which made possible the realisation of a poverty dividend created in the 1920s, is in our view a crux helping to explain why the historical roots of poverty are so deep in the settler economies, and why the post-1990 fall in poverty in the peasant export economies has been so dramatic.

Secondly, and directly connected with the ebbing of the 1970s tide of political violence and instability described above, patterns of both recurrent and capital expenditure were reformed in a far more pro-poor direction in the peasant export economies than in the settler economies. In Uganda, in the aftermath of a savage guerrilla war, large inflows, both of official aid and NGO contributions, entered the country. Donors took advantage of the opportunity to contractually exchange additional aid inflows in return for a pro-poor reallocation of parts of the expenditure budget. The Permanent Secretary to the Uganda Treasury explained in this way how this was achieved:

We were being asked to implement cuts in the civil service establishment [in order to meet government expenditure ceilings agreed with the IMF] and at the same time I was being asked for ideas about how to make the expenditure programme more pro-poor. It immediately occurred to me that the way to do this was to offer to exempt from the process of retrenchment [*i.e. civil service cuts*] the expenditure sectors that we saw as having most benefit to poor people – that is, primary health and education, agricultural research and

²⁷ The diffusion of cocoa and coffee proceeds was in particular to three groups: (1) to workers (given that peasant production is very labour-intensive); (2) to backward and forward linkages industries; (3) in the case of food crops, to consumers. For further analysis, see Reinikka and Collier (2001), especially chapters 4 and 5.

extension, and rural water and sanitation. Primary health and education we saw as particularly important because of the HIV/AIDS situation, and also because we were working towards the objective of universal primary education by the millennium.²⁸

Thus was formed, for the first time since the 1920s, a political coalition in Africa in support of pro-poor action – in this case between aid donors, large and small farmers,²⁹ and trading interests willing to take a bet on benefiting from the liberalisation of smallholder grain production. The incentives to collaboration in support of such coalitions were much greater, because the costs of the coalitions coming unstuck, in the form of a renewal of war atrocities, from whose effects many Ugandans are still recovering, were obvious to all parties. A similar argument applies in the peasant export economies of Ethiopia, Rwanda and Mozambique, each of which came to the end of savage guerrilla wars in the 1990s.³⁰

As can be seen, although the reforms described above relate to the poverty content of *recurrent* expenditure, they also have implications for the pro-poor reorientation of capital expenditure, especially in the case of the universal primary education objective. No pro-poor chemistry at this time occurred in the settler economies, where (with the occasional exception of Zambia) the poverty element of the policy dialogue was notoriously tense and uncreative.³¹

It is of relevance that at this time the ambience of international finance was altering, firstly towards a pro-poor emphasis and secondly towards different technologies for achieving this objective. The International (later Millennium) Development Goals in 1996 consolidated the international financial institutions' intention to prioritise the poverty reduction objective above others. One element in this was the development of Poverty Reduction Strategies (PRSs; formerly Poverty Reduction Strategy Papers, PRSPs), under which recipient governments were invited to produce poverty reduction plans agreed with all of their political 'constituencies', and in particular poor people. At the same time, the conditionality objective – the main proof of the World Bank's structural adjustment strategy from 1980 until that time – was being abandoned, on the evidence that it usually did not work.

The new system left much more of the initiative with the recipient. In particular, it provided more leeway for recipients to propose a policy package (e.g. as part of a

²⁸ Emanuel Tumusime-Mutabile, interview with author, 3 November 1994.

²⁹ In Uganda, the fact that the President had won a guerrilla war and had a rural power-base amongst smallholders in the southwestern region was crucial (a similar argument applies to Tigre in Ethiopia).

³⁰ Ghana was a slightly different case, because in the 1980s it was recovering, not from civil war, but simply from 20 years of systematic mismanagement of its economy.

³¹ In the cases of Kenya and Zimbabwe, on which we focus here, this is particularly clear; indeed, the aid donors had been expelled from Zimbabwe by 1999.

PRSP), as part of a long-term agreement, rather than for such packages to be imposed on them by donors. The peasant export economies – and in particular six of them: Ghana, Uganda, Tanzania, Ethiopia, Rwanda and Mozambique – were much keener, given the nature of their political economies, to propose initiatives of this type than were the settler economies. Within the context of the Lewis model of Figure 4, both the liberalisation of export taxation and the emergence from the governance crisis of the 1970s can be seen as shift parameters, which moved the demand-for labour curve outward, and raised the real wage, much more rapidly in the peasant export than in the settler economies.

Current poverty dynamics in Africa are therefore, we argue, deeply rooted in political forces established many years back, including in particular the structure of institutions (notably affecting control over land) and policies (notably affecting the composition and incidence of public expenditure) established early in the colonial period. In the next section, we seek to estimate statistically the effect of these changing political alignments on the key welfare indicators in our model – the real wage level and the infant mortality rate.

3. Real wage and mortality regressions

3.1 Specification of the ‘augmented Lewis model’

We are using infant mortality as a measure of poverty (or the reverse of wellbeing), and in the preceding discussion we have examined the political influences bearing on the wellbeing of the poor and its principal components, labour incomes and agricultural sales. Labour incomes are, of course, the principal dependent variable of the Lewis model (Figure 4 above). The main contribution of this paper has been to chart time series of these principal components, and to identify a key policy variable influencing the outcomes of the Lewis model, namely government pro-poor expenditure and investment in the physical and human capital of the poor. We now specify the long-term influences on poverty, which we are seeking to estimate in the form of an expanded version of the Lewis model.

The Lewis model (Figure 4 above) is in its essence a supply-demand model of the labour market, with the demand for modern-sector labour corresponding to the marginal revenue product of labour, and therefore declining with increases in the amount of labour hired:

$$L_d = \alpha_1(L, w) \quad (1)$$

where L_d = demand for labour, L = labour force and w = real wage of unskilled labour within the modern sector

whereas the supply of labour is governed by the conditions under which labour is willing to detach itself from the subsistence economy, being ‘unlimited’ in those cases

where there are many applicants for every job at the going wage. In his 1954 essay (Lewis, 1954: 409), Lewis speculated that labour would leave the subsistence economy, as long as the wage offered exceeded the average productivity of labour in the subsistence (or 'traditional') sector. This formulation has the merit of focusing attention, as Lewis wished, on the productivity of the subsistence sector on small-scale farms and elsewhere as the basic driver of the real wage, and thence of poor people's wellbeing.³² On this view,

$$L_s = \alpha_2 (Y_s / L, w) \quad (2)$$

where Y_s = output from subsistence sector and L_s = labour supply.

Our main innovation has been to argue that both the level and the mix of taxation and public expenditure make a difference to the operation of this model, and thence to the long-term poverty index. For, as discussed in the previous section, the level of government investment and the extent to which that investment was focused on the infrastructure and the human capital of the poor, both through capital and through recurrent expenditure, increased the productivity of the subsistence economy. By the same token, taxation imposed on that subsistence economy, especially through the removal of the difference between the price of staple exports and the farm-gate price into a 'price stabilisation fund', reduced the subsistence sector's productivity. Finally, political instability at various points reduced the subsistence sector's productivity, a problem which, within our sample, reached its nadir during the chaos of the Idi Amin period in Uganda,³³ but which caused severe depletion of African productivity and competitiveness at many other times. We insert these four variables: the real level of public expenditure; the extent to which that expenditure was focused on low-income Africans; the level of agricultural quasi-taxation; and the level of political disturbances; into the demand function (1):

$$L_d = \alpha_1 (g, ppe, t, SPI)(L, w) \quad (1')$$

where g = real level of government expenditure

ppe = share of total expenditure committed to 'pro-poor' functions

t = level of quasi-taxation (export price, less price received by farmers) on agricultural exports

SPI = socio-political instability index

Solving for the equilibrium real wage, reached at the point where (1') equals (2), we have

$$W^* = f [(\alpha_1/\alpha_2) (g, ppe, t, SPI)(Y_s/L)] \quad (3)$$

³² 'The prices of tropical commercial crops will always permit only subsistence wages until, for a change, capital and knowledge are put at the disposal of the subsistence producers to increase the productivity of tropical food production for home consumption' (Lewis, 1954: 442)

³³ See Joergensen (1981) and Reinikka and Collier (2001).

- in words, the real wage level can be expected to evolve over time at a rate determined by the fundamental factor, identified by Lewis, of the productivity of the subsistence sector, and also by variations in the fiscal instruments which bear on the productivity and asset holdings of the poor (g, ppe, and t) and political disturbances (SPI).

Because almost all of the livelihood of the poor derives either from wages or from agricultural (crop and livestock) incomes – themselves also subject to political disturbances – it is reasonable to suppose that these three factors have a large part in explaining our chosen indicator of poverty – infant mortality, M:

$$M = f(W^*, Y_s/L, SPI) \quad (4)$$

Finally, political instability is not exogenous, but is determined by the forces determining the incentive to rebel against the government, including in particular the real labour income and educational level of potential rebels, and the extent to which government policies provoke or seek to calm incipient conflict.

$$SPI = f(Y_s/L, ede, MC) \quad (5)$$

where ede represents investment in education and MC is ‘military centrality’, or the factors – including the level of military expenditure – determining the level of provocation or otherwise of the civil population by the government.

The basic system which we wish to estimate consists, therefore, of an equation determining long-term poverty (4), one element in which is real wages, which are determined by the real wage equation (3), and another element in which is political instability, which is endogenous to individual wellbeing (Nafziger and Auvinen, 2000; Collier and Hoeffler, 1998, 2004).

Our first estimates of the basic estimating equation for mortality (4) are presented in Table 5, separately for each of the case-study countries. Several of the variables in the data-set, notably mortality, agricultural productivity and pro-poor expenditure, are subject to a time-trend, which is controlled for by including it explicitly in the estimating equation. All of the independent variables in Table 5 have the expected sign: our interpretation is that if the legal framework is consistent with wide-scale improvement of smallholder agricultural productivity – as was achieved in Ghana and Uganda during the interwar period – that ‘puts a floor’ under the level of the real wage, which in turn reduces the mortality indicator of poverty. In addition, however, policy influences play a role. Increases in the PPE ratio (the share of pro-poor expenditures in the total), increases in the share of the export price received by the producer, and decreases in political instability are all associated with reduced levels of mortality. However, the policy variable, the PPE ratio, has more leverage on mortality in the peasant export economies, Ghana and Uganda (third row of the

table), whereas agricultural productivity (real value added per capita) has more leverage in the settler economies, Kenya and Zimbabwe.

As discussed above, two of the determinants of mortality, agricultural productivity and political instability are endogenous, and therefore there is a risk that simple OLS regressions, such as those presented in Table 5, may present biased estimates of the determinants of mortality. To offset this bias, we present in Table 6 estimates of the determinants of mortality derived by instrumental variables methods, in which separate equations for agricultural productivity and political instability are estimated simultaneously with the mortality equation. These estimates also differentiate between the different components of expenditure contained within the pro-poor expenditure ratio.

Table 5. Single-equation OLS mortality regressions
Dependent variable: infant (under 1) mortality. Estimation period: 1914-2009

Regression coefficients on independent variables	'Peasant export economies'		'Settler economies'	
	Ghana	Uganda	Kenya	Zimbabwe
Constant	319.2** (8.27)	304.0** (19.69)	151.7 (2.62)	300.9** (18.39)
Real agricultural value added per capita (first difference; kg/ha)	-.14 (0.29)	-.19 (1.70)	-1.83** (2.63)	-0.58* (1.64)
PPE ratio	-3.23** (4.65)	-4.67** (4.98)	-0.65 (0.80)	-2.03 (1.68)
Share of export price received by farmer	-90.9* (2.15)	-84.4** (3.43)	-61.5 (0.77)	-40.6* (2.52)
Conflict dummy	-7.79 (0.28)	-0.21 (0.28)	-8.29** (3.52)	-1.26** (2.94)
Time (years since 1914)	-2.11** (6.99)	-2.65 (8.65)	-0.98** (2.90)	-2.46** (12.68)
R ²	0.78	0.85	0.72	0.96
N	49	65	13	58

Table 5: Notes and sources

All relationships are estimated as single equations by OLS. Data are derived from the following sources:

Mortality indicator (M): Infant mortality rate, that is mortality rate per thousand of those below one year of age: principally from World Bank, *World Development Indicators*, and from Kuczynski (1949), supplemented by sources listed in Appendix 1 below.

Real wage indicator (W) 1914=100 in all cases. Data arrays for money wages and price indices are presented in Appendix 1 below.

Agricultural sales (AS) are agricultural sales of African origin per head of African population, derived from *Blue Books* and *Annual Trade Reports* of the countries specified. These are defined as sales within the following countries: *Zimbabwe*: maize, 'small grains' (finger and bulrush millet), groundnuts, cotton, smallholder tobacco, fruits vegetables. *Kenya*: maize, smallholder coffee, smallholder tea, smallholder pyrethrum, fruits, vegetables. *Kenya*: maize, smallholder coffee, smallholder tea, smallholder pyrethrum, fruits, vegetables, sugar. *Ghana*: maize, cocoa and derivatives, kolanuts, fruits, vegetables, sugar.

Pro-poor expenditure (PPE): combined share of agriculture, health and education in GDP, from *Blue Books*, and after 1970 from IMF *Government Finance Statistics Yearbook*.

Pro-poor expenditure less coercion (PPE-C): combined share of agriculture, health and education, less share of 'coercion' (military, police and prisons expenditure) in GDP, from *Blue Books*, and after 1970 from IMF *Government Finance Statistics Yearbook*.

Share of export price received by producer. Uganda to 1978: *Annual Trade Reports*; after 1978: Figure 3.8, 'Development of producer prices in Uganda', in Akiyama (2001). Ghana, to 1978: *Annual Trade Reports*; after 1978: Figure 2.6, 'Cocoa producer prices in West Africa', in Varangis and Schreiber (2001).

Table 5: Notes and sources (cont.)

Political instability index is measured as the product of the *ucdp_loc* conflict index presented in Appendix 1 and 'military centrality', represented here as the share of military expenditure in total expenditure.

Full data arrays and further details of estimation methods are presented in Appendices 1 and 2.

Table 6. Simultaneous-equation regressions: mortality, wages and political instability index
Estimation method. 3SLS. Estimation is for period 1914-2007, unless otherwise stated.

	'Peasant export economies' (Ghana and Uganda)			'Settler economies' (Kenya and Zimbabwe)			Whole sample		
<i>Dependent variable:</i>	Infant (under 1) mortality	Real wage index	Conflict dummy	Infant (under 1) mortality	Real wage index	Conflict dummy	Infant (under 1) mortality	Real wage index	Conflict dummy
<i>Regression coefficients on independent variables:</i> Constant	130.2** (5.47)	193.7** (3.77)	6.57** (13.01)	222.4** (5.43)	68.0** (5.82)	0.68 (0.34)	-171.4** (7.49)	135.8** (3.41)	5.95** (13.75)
Agricultural value added per capita (first difference; kg/ha)	-0.35 (0.83)	2.92** (3.08)		-1.59** (3.71)			1.46* (1.96)	3.58** (4.60)	
Real wage(first difference)	-0.30 (1.44)		0.003 (1.12)	-0.49** (2.70)	2.16** (7.04)	0.009 (0.71)	-0.27* (2.13)		0.005* (2.46)
Conflict dummy	14.85** (6.73)			3.94** (3.09)			9.90** (5.94)		
Share of education in total expenditure	-5.82** (3.60)			-8.01** (7.69)			-10.71** (5.31)		
Share of health in total expenditure							-4.27 (0.74)		
Share of agriculture in total expenditure							11.1** (6.47)		
Share of military in total expenditure		-11.09 (1.64)			6.01* (2.24)			-4.91 (0.89)	

PPE ratio (net of military expenditure)			-0.21** (4.68)			0.16 (1.67)			-0.19** (6.00)
Producer's share of export price	31.7 (1.61)			86.7** (3.27)			38.5* (2.26)		
R ²	0.45	0.16	0.70	0.84	0.18	0.01	0.70	0.19	0.21
Hansen-Sargan overidentification statistic	143.2			63.9			220.3		
Number of observations	107			57			137		

Sources: as for Table 5. All data arrays are in Appendices and 2 below.

Notes: 'Conflict dummy' is defined as sum of ucdp_loc conflict index (see Appendix 2) and 'military centrality', defined here as the share of military expenditure in total expenditure.

Figures in parentheses below coefficients are student's t-statistics. ** against a coefficient denotes significance at the 1% level and * denotes significance at the 5% level.

Across the sample as a whole, within the set of expenditures which our prior analysis has identified as 'pro-poor', educational expenditures appear to be much the most significant in terms of bringing down poverty, and in particular more significant than health or agricultural expenditures. In the mortality equation, a one percent increase in the share of educational expenditures in total expenditure is highly significant across the sample as a whole, and associated, when the sample is subdivided, with an eight percent reduction in the infant mortality rate in the settler economies, or a five percent reduction in the peasant export economies. This effect appears to be stable across the time period of our sample, but is stronger during the colonial period, prior to 1960, than during the post-colonial period.³⁴ The real wage is significantly determined, as Lewis predicted, by agricultural productivity, and the likelihood of conflict is determined both by the real wage and, more significantly, by the pro-poor expenditure ratio, supporting our hypothesis that the allocation of expenditure exercises influence on poverty indirectly through its impact on the likelihood of conflict, as well as a direct influence on indicators of wellbeing. This method of estimation appears to deal satisfactorily with the problem of endogeneity of the real wage and of conflict: the Sargan test statistics indicate that the system of equations is adequately identified.

4. Conclusions

On our interpretation, improvements in smallholder agricultural productivity have been the prime mover in enabling poverty, in some poor African countries, to be brought down over time. Some of the recent successes in this field represent the realisation of assets established many decades ago. At a different rate within different types of colonial and post-colonial structure, these improvements in agricultural productivity have put a floor underneath the subsistence-determined wage of the Lewis model (1954), and in so doing they have helped, especially in the 'peasant export' economies, to even up the income distribution and thus achieve a further development dividend through their contribution to conflict reduction. They have not done this unaided, and the composition of public spending, which is in turn determined by the character of the prevailing political regime and its ability to maintain the rule of law, has exercised a measurable influence on the ability of the economy to reduce poverty. Within the set of expenditures whose influence is identifiable from Table 6 as being pro-poor, by far the most robust of these influences is that working through educational spending. This supports the intuition of Sir Gordon Guggisberg, who, as governor of the Gold Coast in the early 1920s, put education as the first priority in his inaugural development plan.³⁵ It also supports the subsequent econometric analysis of mortality by Ssewanyana and Younger (2007).

³⁴ Within a three-equation system comprising infant mortality, real wages and conflict identical to that estimated in Table 6, the coefficient of educational expenditure on infant mortality is strong (a coefficient of 15.4) and significant at the one percent level across our sample as a whole for the period prior to 1960, whereas it is insignificant for the period after 1960.

³⁵ See Kimble (1963): 109-125, and Wraith (1967), chapter 6.

At this point, our argument intersects with the argument about institutional impact put forward by Acemoglu *et al.* (2001). There is no doubt that effective institutions, as they argue, are an abiding positive influence on economic development, but we take a different view of the institutions which are important. In our interpretation, the institutions which have been important in determining long-term trends in wellbeing in Africa are the allocation of land, the level of capital expenditure on infrastructure, and the allocation of recurrent expenditure between 'developmental' and 'non-developmental' functions. All of these are influenced by the initial decision at the turn of the 20th century to establish colonies as either settler or peasant export economies. Institutional development, in other words, was determined by prior political decisions, and the institutional structure, which on our analysis optimised the rate of poverty reduction, was not a structure which protected the colonists' property rights against expropriation, but rather a structure which protected African smallholders' property rights against the colonists.

Over time, we argue, this structure, much though it was buffeted by export taxation and political instability between the 1940s and the 1970s, contributed to a stock of physical and human capital within the peasant export economies of Uganda and Ghana. Their governments were able to draw on this capital in a poverty-reducing manner during the 1990s, with the help of a big liberalisation dividend as the level of quasi-taxation by marketing boards was finally reduced. By contrast, in the settler economies of Kenya and Zimbabwe, the level of inequality was persistingly higher and the intersectoral allocation of government expenditure persistingly less favourable to lower income groups: the 'historical stock' of poverty-reducing institutions and assets which Uganda and Ghana had been able to accumulate was not available to them, and the poverty trend since the middle 1980s, in both countries, has been much less favourable. In other words, our argument is that long-period poverty trends are determined by poverty-reducing institutions, which in turn are in part determined by colonial policies.

Many readers of this paper will have seen the huge advertisements for the Coffee Marketing Board on the road from Kampala to Entebbe, asserting that 'Coffee Eradicates Poverty'. It went a long way towards doing so, during the 1990s; but only because it was in the hands of low-income producers, because those producers had access to a supportive infrastructure established in or before the 1920s, and because recent reforms had removed the barrier which for 50 years had been imposed on farmers' share of the export price. In illustrating these things, we hope to have shown the part played by deep-rooted historical influences, the understanding of which may help the present-day process of poverty reduction.

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Appendix 1. Annual wage, price and mortality data (1912-2009), four African countries

	'Settler economies'								'Peasant export economies'							
	Zimbabwe				Kenya				Ghana				Uganda			
	M	MW	PI	RW	M	MW	PI	RW	M	MW	PI	RW	M	MW	PI 1914 =100 (1989=100 in brackets)	RW
1912														5		
1913																
1914			100			18.6	100	100		30	100	100	100	7	100	100
1915							148	80						6.65	107	97
1916		18		100		16	117	62	292					325	110	90
1917		22		81		15	145	51						335	129	81
1918		18		74			195	65		22		68		345		70
1919				70			254	68						360		60
1920			161	64		15	226	80			265			370	6.4	258
1921	338	21		45		17	306	91	247					350		62
1922	329	22		57			226	77						340	12.5	65
1923	322	23		65		18	211	50						320		75
1924	300	21		55		20	233	50		45	123			305	11.5	218
1925	290	19		51	400		224			45	124	122	288	20	195	109
1926		25	109	74	380	23	202	65		45	118	129		276		112
1927	274	26	109	89	370	23	173	75	122	45	124	148		260		114
1928	270		112	91	355	23	166	74	138	45		148		254	13.6	173
1929	282	25	111	94	340	21	158	68	113	45		141		233	11	90
1930	284	23	103	91	332	21		76	116	36	112	118		224		80
1931	287	18	98	92	325	18	122	81	114	42				210		78
1932	295	17	94	83	310	15	120	68	102		90	147		173	9	72
1933	280		92		306	13	111	66	100					161		59
1934	272		91		290	14	121	64	106					189	8.5	205

1935	26 7	15	91	78	28 7	14	108	69	12 7	36			166			215
1936	25 5		89	80	27 4	14		77	10 7	42			159			230
1937	24 8		95	83	26 5	17		80	11 7	51			156	11	63	248
1938	23 8	17		86	25 0	16		78	10 2				147	12	55	244
1939	24 1		100	84	24 0		101	76	11 0				131		89	240
1940	24 6			82	23 0			74	11 0				134			226
1941	25 4			80	22 2			72	11 0	54	122	15 0	124			195
1942	25 6			78	21 0			71	11 8				137			160
1943	25 8			76	19 8			70	12 9	54	122	15 0	121	15.5	142	155
1944	26 0			75	18 9			68	12 5				116			130
1945	26 4			73	18 2	24		67	12 8			14 9	119		157	115
1946	25 0	26		72	17 7	28		77	13 1	63	139	15 1	121	14	166	101
1947	22 7	36	198	96	16 5	36	198	90	13 3	81		15 0	126		174	120
1948	22 2		213	96	17 0		207	96	13 2	81	183	14 9	128		237	140
1949	22 0		224	97	17 5		215	10 2	13 4	96	183	15 4	144			160
1950	21 6	73		97	18 1	74		10 9	13 0		211		143	33.5	255	187
1951	20 8	51	261	98	17 0	51	289	98	12 8		217		142			175
1952	19 7	58	272	99	16 7	58	325	99	13 1	135	300	15 1	140	32	274	166
1953	18 5	62	285	106	17 9	62	324	10 6	12 6				139		275	180
1954	18 0	64		111	17 8	64		11 1	12 4				138		284	250
1955	17 8		296	116	17 8		390	11 4	12 7				137	53	302	300
1956	17 4		310	121	16 4		379	12 0	13 2	153	344	14 4	136		316	320
1957	16 8	86	320	126	16 0	87	380	12 6	12 4	153	344	14 6	135		323	330
1958	16 4		331		14 5		400	12 3	12 4	165	367	14 7	134		326	340
1959	16 0	87	340	120	13 5	87	400	12 0	12 3	165	367	15 1	133	80	326	349
1960	15 9	88	343	121	12 2		404	13 0	12 2	195	433	16 5	133	114	331	437
1961	15 7	90	288	140	11 7	90	416	14 0	12 0		446	18 0	127	131	341	460

1962	15 4	92	310	142	11 4	92	424	12 1	12 1		454	20 5	123	147	359	492
1963	15 2	101	340	149	11 2	10 1	436	12 8	12 0		485	22 0	119	164	391	510
1964	14 8	131	370	155	11 0	12 8	447	15 8	12 0		532	23 5	115	194		560
1965	14 5	132	388	149	10 8	13 4	437	16 1	11 9		622	25 5	111	215	490	561
1966	14 3	135	395	152	10 6	14 2	444	16 7	11 6		673	27 4	109	230	529	563
1967	14 2	132	399	153	10 4	14 0	455	16 0	11 4		647	30 2	107	241		564
1968	14 0	133	403	156	10 2	14 6	463	16 3	11 3		727	32 2	105	247	595	566
1969	13 9	133	408	151	10 0		461		11 1		808	33 6	104	264	608	567
1970	13 8	137	414	149	96		533		11 0		832	34 5	100	290	661	569
1971	13 4	141	422	148	94	16 3	475	17 7	11 6		875		98			530
1972	13 1	145	426		92	19 4	480	20 8	11 4		1014		95			500
1973	12 8	154	430		91	19 2	529	18 6	11 3		1212		101			440
1974	12 4	156	434	146	89	19 2	613	16 1	11 1		1530		115			380
1975	12 0	179		147	87	30 2	686	22 6	10 0		1988		119			360
1976	11 8	205= \$24.1		149	85	46 9	815	29 5	98		2544		124			340
1977	11 6	\$26.8		151	81	48 3	952	26 0	97		4267		126	549	2960	320
1978	11 4	\$29.3		152	79	54 1	980	29 9	95		7518					300
1979	11 1	\$34.2		153	77	56 4	1036	29 5	93		1036 3		119			280
1980	10 8	\$38.1	868	154	73	43 1	1134	20 6	92		1564 6		118			270
1981	90	\$62.0		251	71	47 9	1257	20 7			2743 1		117			261
1982	81	\$76.5		247	69	49 9	1393	19 4	87	C11 5=\$4 2 (US)	3587 2	20 1		800	5335 (12)	258
1983	80	\$88.3		231	68	53 6	1557	18 6	85		8018 5		116			244
1984	79	\$98.0		213	68		1714		84		1.1 E05					220
1985	78	\$103.8	1741	208	65	54 9	1854	16 0	83		1.3 E05		114	100 0	6500 (15)	199
1986	76	\$114.5		184	68	61 9	2021	16 5	83		1.8 E05					180
1987	74	\$122.1		178	66		2193		79		2.6		113			178

										E05				8446 (19)		
1988	72			175	66	76 9	2380	17 4	79		3.4 E05		112	312 7	2534 5 (57)	176
1989	71	\$150.6		160		84 6	2581	17 6	76		4.5 E05		111		2860 8 (100)	210
1990	69	\$182.8		155	64	94 6	2822	17 8	74		6.1 E05		102	650 0	3793 7 (122)	242
1991	68	\$203.3		152	63	10 74	3148	18 1	70	C35, 212= \$74 (US)	7.3 E05	35 0	101	660 0	4851 1 (157)	260
1992	66	\$171.5		137	67		3698		70		8.1 E05		101	198 10	7401 1 (239)	280
1993	67	\$243.8		128	67		4128		68		1.08 E06		100		7867 4 (253)	295
1994	64	\$286.9		116	73	15 00	5582	14 2	65		1.54 E06		98	200 00	8676 0 (279)	328
1995	66	\$295.7		114	73		6208		65		1.97 E06		96		9235 8 (297)	340
1996	68	\$401.3	1392 8	108	74	19 50	6774		63		2.35 E06		95	265 00	9919 9 (319)	355
1997	71			106	76	23 25	7840	15 6	62		2.81 E06		94	340 00		448
1998				104	77		8561		62		3.29 E06		90		7681 7 (345)	540
1999				101	77		9051		60		3.75 E06		88		8082 5 (366)	560
2000	73			99	78				58		4.77 E06		86		8148 7 (369)	575
2001	76								57		6.42 E06			690 00		

Uganda: from *Blue Books*, 1928, 1938 and 1944, sections on prices, wages and imports; the items of consumption used to compile the deflator prices are cotton piece goods, kerosene oil, bicycles, sugar, soap, maize flour and bananas (*matooke*). From 1947-1977, we use Uganda Government, *Kampala lower income cost of living index*, as published in successive issues of the *Statistical Abstract* and *Quarterly Economic and Statistical Bulletin* (typically Table UO6). After 1982, the consumer price index as published in Ministry of Finance and Economic Planning, *Financial Statement and Budget Report*, annual, is used. During the period 1977-1982, the *Quarterly Economic and Statistical Bulletin* is also used, but this was a period of considerable political turbulence and the price data published in this period should be regarded with some scepticism (see, for example, Joergensen 1981, pp. 298-299 and Table 6.7). The entire period 1971-1982 should be regarded as a weak link in the Ugandan part of the table.

Ghana: Gold Coast, *Social and Economic Progress: Annual Reports*, section on 'wages and cost of living' and imports; items of consumption used to compile the deflator prices are as for Uganda, with the addition of wheat flour and minus bananas. From 1939-1963, supplemented by wage index for unskilled workers in Accra 1939-1963, in Birmingham *et al.* (1962), Table 6.12.

After 1960, all countries: from World Bank, *World Development Indicators*.

Real wages, for all times and all countries, are money wages, MW, deflated by the consumer price index, PI.

Appendix 2. Annual data on determinants of poverty (mortality), four African countries

	'Settler economies'								'Peasant export economies'							
	Southern Rhodesia/Zimbabwe				Kenya				Ghana				Uganda			
	Ava c	Ptf	ede	ppe	Ava c	ptf	ede	pp e	avac	ptf	ede	pp e	avac	ptf	ede	ppe
1912								6.9								
1913					1.3											
1914					4.9								
1915					..				34.7		1.8	4.7	1.6		0.4	6.3
1916					..			7.3	30.6		2.5	5.7	1.7		0.3	7.1
1917					..		2.4	8.1	23.1		3	6.4	1.6		0.4	6.4
1918				6	..		2.6	8.6	9.6		3	6.8	1.5	0.5 2	0.4	6.7
1919				7	..		2.3	8.9	27.8		3.1	7.4	2.6	0.5 5	0.4	8.4
1920	2.5			7	..		2.6	10. 4	32.9		4.2	8.9	3.2	0.4 1	0.5	8.5
1921	1.0			8	..		2.8	11. 2	14.8		5.7	11. 2	9.7		0.5	6.7
1922	..			8.5	0.57		3	12. 5	25.6		7	13. 1			0.7	6.9
1923	..			9	0.66		3.3	12. 1	29.3		8	14. 3			1.2	8.1
1924	..			9.2	1.07		3.6	12. 5	31.6		8.5	15. 1	2.5		1.6	9.1
1925	..	.85	4.9	9.5	1.34		3.8	12	46.6		9	15. 7	5.3		2.0	11.7
1926	..	.85	5	17.5	1.17	.83	4.4	11. 3	38.8		10	16. 9	8.8		3.2	12
1927	1.6	.86	6	17.5	1.14		4.6	10	48.1		10. 5	18. 1	11.7		3.3	11.8
1928	3.6	.86	6.9	12.4	1.15		4.8	10. 4			12	19. 7	10.6		3.6	12.9
1929	2	.86	7.4	12.8	1.71	.81	5.1	13. 8	37		13	21. 2	5.9		3.5	13.1
1930	2.8	.75		14	1.56	.82	5.5	13. 7	33		12	20. 5	9.1		3.9	1.8
1931	..	.70		13.6	0.58	.80	5.7	13. 4			11. 9	21. 8	10.7		4.6	15.7
1932	1.5	.64		12.9	1.02		5.8	11. 7			12. 4	22. 8	9.9		5.3	15.5
1933	2.4	.60		13.0	1.31		6.1	11. 8	29.3		12. 5	23	14.4		6	18
1934	7.2	.65		13.1	1.1		6.3	12. 4	27.1		12. 6	20. 3	11.8		6.2	19.2
1935	6.8	.65		12.9	1.39	.59	6.6	12. 9	26.1		12. 5	21. 4	18.6		6.3	18.3
1936	9.2	.67		13.5	1.74	.60	6.8	14.	23.5		12.	21.	21.8		5.7	18.2

								7			1	8				
1937	7.3	.67		13.8	2.68		6.9	13.4	29.1		12.1	21.3	19.1		6	19
1938		.72		13.6	2.3	.66	7	12.5	39.2		11.6	20.6	15.2	0.24	6.2	18.6
1939		.75		14	2	.67	7.2	13.7	21.6		11.5	20.2	21.6	0.22	7.4	18
1940		.88		13.8			7.3	13.7	40.1		11.5	19.9		0.20	7.4	19.6
1941	8.4		8	14.8	4.0	.51	7.4	13.8			11.5	19.5	26.7	0.18	7.1	19.3
1942	12.8	.22		15	3.8	.37	7.4	14.9			9.7	16.8	12.8	0.24	6.6	18.9
1943		.32		13.9	2.7	.62	7.3	11			8	14.2	8.1	0.18	6.8	20
1944		.3		14.4	2.8	.37	6.9				7.2	12.9	20.4	0.19	7.9	20.2
1945			9.6	20.5	2.8	.68	6.7	13.4			8	13.5			8.8	19.8
1946			11.6	18	2.8	.55	6.1	13.5			9	14.2			10	23.2
1947			12.1	20.9	3.1	.59	6.5	14.3		.56	9.5	16.8			10.6	24.8
1948			12.8	23.2	3	.64	6.6	14.2		.62	10	19		0.18	10.9	25.3
1949			13.4	22.9	3.7	.49	6.7	14.3		.11	11	20.2		0.16	8.3	22.6
1950		.2	14.1	22.3	5.2	.46	6.8	13.9		.59	10	16.9		0.13	8.7	25.4
1951	15.4		13.9	24.4	5.5	.33	6.9	14		.51	10.6	17.3	22.6	0.12	7.5	25.4
1952	4.9		13.8	23.2	5.4	.37	7	14.2		.39	11.7	19.4	37.3	0.15	8.5	25.8
1953	15		13.9	22.9	6.1	.47	6.8	14.6		.45	13	25.5	36	0.22	9	26.1
1954	13.2		13.7	24.4	6.1	.59	6.7			.66	13.4	22.4	23	0.19	8	26.5
1955	29.5		14	23.2	6.9	.70	6.8	14.8		.6	14	23.2				
1956	8.1		14.1	24.3	6.7	.69	7.5	15.4		.33	14.1	24.7	28	0.26	8.5	27.1
1957	6.5	.36	13.8	23.6	7.1	.79	8.4	15.8		.26	14.1	25.7	27	0.28	9.2	27.5
1958	7.4	.36	13.9	22.7	8.6	.75	8.7	16.3		.58	14.3	29.2	35.1	0.31	9.3	28.4
1959	5.2	.27	13.8	21.9	8.9	.64	9.5	16.8		.52	12.3	26.4		0.29	9.5	29
1960	11.3	.39	13.9	22.3	9.4	.92	9.6	16.7		.49	14.5	27.6		0.32	9.7	28.7
1961	14.5		14.1	21.6	11.5	.85	9.7	16	35.5	.34	15	28.9		0.31	10	29.8
1962	20.1		14	22.1	12.1		9.8	16.5	34.4	.35	16	30	28.1	0.31	11.5	30.2
1963	6.6		14.	22.7	13.4		9.7	16.	34	.38	16.	30.	30.8	0.2	11.7	31.4

			1					8			2	8		6		
1964	1.5		14. 3	22.4	20.5		15.3	9.8	33.6	.4	16. 6	31. 2	28.6	0.2 4	12.9	32
1965	1.4		14. 4	21.8	18.0		9.7	17. 5	50.3	.38	17. 8	33. 7	39	0.2 5	13.4	31.2
1966			14. 5	21.2	21.6		9.9	17. 7	68.7	.45	22. 6	36. 7	45.6	0.2 4	12.3	33.4
1967			14. 6	20.9	21.5		9.8	18. 2	71.4		19. 4	32. 4	40.4	0.2 0	10	29
1968			14. 5	20.5	21.9		10	18. 9	69.8		19. 7	33. 3	41.5	0.1 9	13.5	28.5
1969	32.9 9		14. 4	20.9	23.3		9.9	19	73.9		19. 8	32. 8	46.2	0.2 5	13.3	29.7
1970	29.8 6		14. 5	20.6	20.9		9.8	18. 4	81.1				46.8	0.2 2	13	28.7
1971	36.9 4		13. 9	20	23.6		10.1	18. 9	82.6				57.7	0.2 2	14	28.4
1972	40.7 1		14	20.9	25.6		10.2	19. 5	83.2				46.5	0.2 1	12	27
1973	32.0 8		14. 1	20.7	25.5		10.3	19. 9	79.0				35.6	0.2 1	9	23
1974	36.9 8		14. 2	21	24.2		10.2	19. 5	83.4				27.3	0.1 9	9	21
1975	33.9 9		13. 9	20.8	25.2		10.3	19. 9	65.1				26.6	0.1 9	8	19
1976	37.0 0		14	21.4	24.9		10.4	19. 2	62.6					0.2 2	6	14
1977	28.5 3		14. 1	21.6	26.6		10.4	19. 6	57.9					0.2 5	5	12
1978	30.7 7		14. 2	21.5	26.8		10.5	19. 8	67.7					0.2 7	6.2	17
1979	30.0 8		14. 3	21.6	26.7		10.6	20. 1	68.1					0.2 8	6.5	15
1980	29.8 1		14. 5	20.6	26.1		11.5	19. 9	64.1	0.21	11. 8	16. 8		0.3 2	6.5	13
1981	32.9 6		15. 9	22.7	26.7		11.4	20. 9	59.0	0.23	11. 4	16. 2		0.3 3	6.7	14.4
1982	29.5 8		16. 5	24.6	27.7		11.1	20. 6	53.1	0.25	11. 9	16. 8	29.9	0.3 2	6.5	14.5
1983	24.0 9		15. 7	23.3	27.2		9.7	19. 2	56.3	0.25	11. 7	..	31.1	0.3 1	6.6	14.4
1984	28.6 5		16. 2	25.7	25.4		10.3	18. 7	54.1	0.27	11. 4	16. 7	29.3	0.3 0	7	14.7
1985	34.2 7		16. 8	26.1	25.5		11.1	19. 9	55.1	0.31	11. 5	16. 6	27.5	0.3 6	7	15.5
1986	30.4 1		16	25.6	25.9		11.4	20. 2	53.8	0.36	11. 3	16	27.4	0.4 4	7.2	16.2
1987	28.1 8		16. 6	26.6	26.0		11.8	21. 2	54.3	0.42	11. 3	16	27.1	0.5 0	7	14.5
1988	28.1 9		16. 8	27.6	26.3		11.1	20. 5	55.3	0.44	11. 3	15. 4	27.8	0.4 0	7	15.5
1989	28.3 4		16. 9	27.2	26.6		11.4	22. 2	52.9	0.47	11. 3	16. 1	29.3	0.2 6	7.2	15.9
1990	30.9		17.		26.7		11.7	19.	54.4	0.53	11.	14	29.4	0.2	7	15.9

	7		7				7			2			8			
1991	30.7 5		17. 7		25.6		11.7	19. 9	52.2	0.58	11. 8	14. 5	28.5	0.2 8	7.2	16.7
1992	23.2 8		17. 1		23.9		11.2	19. 1	51.9	0.45	12. 4	15. 5	30.5	0.6 0	7.4	17.6
1993	29.2 4		17. 8		22.3 6		12	20. 4	51.5	0.26	12. 4	15. 6	30.4	0.6 5	7.5	17.9
1994	31.0 4		17. 8	13.1	22.3 8		11.4	19. 2	51.9	0.34	12. 4	15. 6	31.5	0.6 8	7.6	18.5
1995	28.3 9		18. 8	14.9	22.7 2		11.3	18. 6	53.4	0.38	12. 4	15. 9	32.2	0.7 6	7.8	18.9
1996	33.6 9		18. 8	15.2	23.0 7		11.4		54.4	0.41	12. 4	16	31.9	0.8 4	8	19.1
1997	34.4 5		18. 4	17	21.7 6		11.5		55.9	0.44	13. 1	16. 6	31.9	0.9 5	8.4	19.3
1998	35.9 0		18. 9	18	22.5 0		11.5		57.4	0.46	13. 5	16. 5	33.4	0.9 7	8.6	19.6
1999	37.1 4		18. 3	17	22.2 4		11.5			0.48	13. 6	17. 8	34.1	0.9 6	9	20.8
2000	37.9 8		13. 9	16	21.2 9		11.3	21		0.50	13. 8	18	35.0	0.9 6	9.1	21.1
2001	33.0 5		14		21.1 8		12.1	21. 5			13. 8	19			9.2	21.5
2002			14				11.1	22			14. 6	19. 6			9.4	20.2
2003			12				12.1				15	21			9.6	21.1
2004			12				12.4				15. 4	20. 4			10	20.7
2005			12													20.9
2006			10													21.4
2007			9													
2008																
2009																

Sources:

Agricultural value added per head (avad) is an estimate, calculated at constant 1975 US dollar prices, of agricultural sales per head of African population. For years after 1960 the estimate is derived from the World Bank *World Development Indicators* CD-ROM. Prior to 1960, it is derived from *Blue Books* and *Annual Trade Reports* of the countries specified, including the following crops: *Zimbabwe*: maize, 'small grains', (finger and bulrush millet), groundnuts, cotton, smallholder tobacco, fruits vegetables. *Kenya*: maize, smallholder coffee, smallholder tea, smallholder pyrethrum, fruits, vegetables. sugar. *Ghana*: maize, cocoa and derivatives, kolanuts, fruits, vegetables, sugar. Per capita sales of these crops, net of an estimate for the value of inputs, are converted to constant 1960 prices by use of the country consumer price indices described in Appendix 1.

Price to producer as proportion of export price (ptf). Uganda to 1978: *Annual Trade Reports*; after 1978: Figure 3.8, 'Development of Producer Prices in Uganda', in Akiyama (2001). Ghana, to 1978: *Annual Trade Reports*; after 1978: Figure 2.6, 'Cocoa producer prices in West Africa' in Varangis and Schreiber (2001).

Educational expenditure as share of total expenditure (ede): includes all public and private, including mission school, expenditure of education; from *Blue Books*, and after 1970 from IMF *Government Finance Statistics Yearbook*.

Pro-poor expenditure (ppe): combined share of agriculture, health and education in GDP, from *Blue Books*, and after 1970 from IMF *Government Finance Statistics Yearbook*.

Appendix 3. Child mortality as an indicator of deprivation

Many views exist on how best to select indicators of poverty, deprivation or well-being. Historically, the first indicators to be used (e.g. Rowntree, 1901), define poverty in terms of the number or proportion of people who fall below a given income standard, defined as the cost of meeting minimum consumption needs – the poverty headcount, or headcount ratio. The poverty-headcount approach has been revived in the shape of the World Bank's (2000) 'dollar-a-day' measure, which uses the one standard metric of income below \$1 per diem at 1990 purchasing-power parity, in place of national poverty lines, in order to standardise the measure of deprivation across all countries. Most analysts, and in particular the global Millennium Development Goals (World Bank 2000, Figure 1.1), supplement the poverty-headcount measure with other metrics, including measures of maternal and infant mortality, education, and in some instances measures of health and wellbeing.

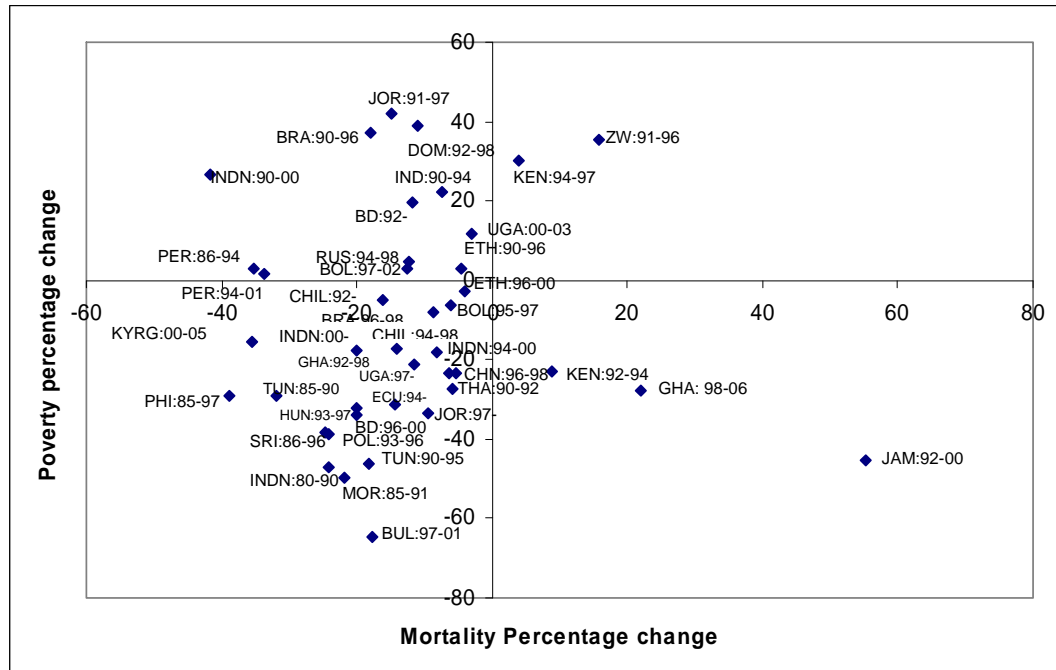
The poverty-headcount measure, in every country, exists only for a small number of years, mostly since the middle 1980s, and therefore is not suitable for assessing long-period trends in deprivation. This appendix considers the case for using infant mortality as a measure of deprivation in those cases where data on headcount poverty are not available.

Reasons for supposing that it may be sensible to use infant mortality as a surrogate for headcount poverty include the following:

1. For countries and periods for which we have data on both variables, infant mortality and malnutrition are closely related statistically. Figure 5 illustrates the relationship between the two variables over the period 1980-2005.
2. The main causes of high infant mortality – which are high vulnerability to life-threatening disease, low availability of basic nutrients, lack of access to medical services, lack of access to clean water and other assets which protect health, and high incidence of civil conflict-related deaths³⁶ – are causally related to material deprivation and specifically to the most extreme form of poverty, which is famine. Even better than the absolute number of people below the conventional poverty line (minimum consumption requirements line), the infant mortality rate captures the idea of *extreme* poverty – those who are so deprived of basic capabilities that they cannot stay alive.

³⁶ For documentation of these influences in the case of Uganda between 1974 and 1999, see the paper by Ssewanyana and Younger (2007).

Figure 5. 61 countries: Relationship between mortality and poverty, 1980-2005



JOR-Jordan; ECU-Ecuador; INDN-Indonesia; IND-India; JAM-Jamaica; ZW-Zimbabwe; KEN-Kenya; ETH-Ethiopia; PHI-Philippines; KYRG-Kyrgyzstan; RUS-Russia; PER-Peru; GHA-Ghana; BUL-Bulgaria; CHIL-Chile; CHN-China; BOL-Bolivia; BRA-Brazil; TUN-Tunisia; HUN-Hungary; THA-Thailand; SRI-Sri Lanka; DOM-Dominican Republic; BD-Bangladesh; UGA-Uganda; POL-Poland.

(The data matrix for these variables is available as an Excel file from p.mosley@sheffield.ac.uk)

A regression for these countries over the period 1990-2005 yielded the relationship:

$$\text{Poverty headcount} = 19.2^{**} + 0.28^{**} \text{ infant mortality, } r^2 = 0.30, n = 291.$$

(11.93) (11.10)

3. Lowered infant mortality is causally related not only to current poverty, but to future poverty – because, through the standard mechanisms of the demographic transition (Livi-Bacci, 1991), persistently lowered mortality rates increase the perceived likelihood of child survival, which diminishes the economic rationale for having a large family, which diminishes the total fertility level (the total number of children born to each parent), which is an important correlate of poverty levels.

However, although *in principle* it may be reasonable to say that poverty and infant mortality are causally linked, the measures of infant mortality available to us in practice may not accurately measure infant mortality, because of errors in measurement, including:

- (i) Until the date of the first Censuses (1911 in Ghana, but not until 1948 in Kenya, Uganda and Zimbabwe), records of infant deaths are based on the recollection of interviewees, not observation by doctors, so mortality data will be wrong if memory is defective or testimony is wrongly transcribed;
- (ii) registration of interviewees was for many periods incomplete, so that what appear to be sharp changes in mortality reflect only changes in the extent to which deaths were registered;³⁷
- (iii) in particular, registrations often omit the births and deaths of children whose lives were very short (Clairin,1966);
- (iv) there are gaps in the mortality series, especially during the war years.

For these reasons, data on mortality do not necessarily measure mortality well prior to the dates mentioned in (i). The finding from this paper about which, consequently, we have the most serious worry is the finding that infant mortality declined sharply in Uganda during the 1930s (Table 3 above). Our time-series on this variable for this period are transcribed directly from Kuczynski (1949). The finding of a fall in mortality is consistent with our data on real wages and agricultural productivity, and we have also attempted to clean the series by deleting anomalous outliers from the mortality series; notwithstanding this, the series for Uganda, Kenya and Zimbabwe must be taken as having a lesser degree of reliability until the 1950s.

³⁷ This problem is particularly well discussed in the studies by Kuczynski (1949) and Goldthorpe (1955).

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Our aim is to better understand why people are poor, what keeps them trapped in poverty and how they can be helped - drawing upon the very best international practice in research and policy making.

The Brooks World Poverty Institute is chaired by Nobel Laureate, Professor Joseph E. Stiglitz.

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