

Agriculture and economic development in sub-Saharan Africa and Asia

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This paper is a comparative study of the role of agriculture in economic development in sub-Saharan Africa and Asia. Popular notions of economic duality and agricultural squeeze in sub-Saharan Africa are re-examined, and new explanations in terms of agrarian structures and resource availabilities are put forward to account for the apparent economic duality in that continent. Comparison with surplus labour economies of Asia highlights the constraints posed by the prevailing agrarian structures for capital accumulation and industrialisation in post-colonial sub-Saharan Africa. Policy conclusions from this new perspective are contrasted with the conventional policies focusing on price reform and market liberalisation.

Key words: African agriculture, Asian agriculture, Economic development

JEL classifications: O13, O57, P41, Q1, Q18, Q24

1. Introduction

The literature on the role of agriculture in economic development in post-colonial sub-Saharan Africa has been dominated by two central themes. The first theme is the extreme economic duality between a ‘modern’ urban sector and a marginalised agricultural sector employing the main part of the labour force and being the main source of sustenance for the larger part of the population. **The second theme is the high rates of agricultural taxation, resulting by and large from price distortions introduced by ‘urban biased’ government interventions, which is said to have perpetuated the economic duality in the post-colonial period.** The heavy drainage of agricultural surplus, mainly taking the form of forced indirect taxation, is argued to have led to the poor performance of the agricultural sector and declining overall economic conditions (see Lipton, 1991; Cleaver, 1985; Bates, 1984; World Bank, 1994). These two themes, which we may refer to as the urban bias or the agricultural squeeze hypothesis, have also played a key role in the policy debate on sub-Saharan Africa and have set the main thrust of adjustment policies introduced in the region since the early, 1980s (see, e.g., World Bank, 1994).

In this paper we re-examine the agricultural squeeze hypothesis by a comparative study of the role of agriculture in capital accumulation and economic development in sub-Saharan Africa and Asia. In the next section, we examine the nature of the duality between

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agriculture and the non-agricultural sectors in sub-Saharan Africa and Asia, by a decomposition of value added per head in the two sectors into its real and price components. We argue that the observed trends in the post-colonial period in sub-Saharan Africa do not appear to lend support to the agricultural squeeze hypothesis. Instead, we try to explain the apparent duality in sub-Saharan African economies in terms of the fundamental agrarian structures in that region as compared with Asia. The differences in agrarian structures between the two regions, emanating from the much lower population densities in sub-Saharan African agriculture, play an important part in explaining the cross-country differences in sectoral per capita income shares. In Section 3, we examine the constraints posed by the prevailing agrarian structures for capital accumulation in sub-Saharan African-type economies in contrast to surplus labour economies in Asia. Section 4 discusses the problems of financing accumulation in labour-constrained agrarian economies and the role of foreign aid in sub-Saharan Africa. In Section 5, we discuss some of the policy conclusions of the paper.

2. Initial conditions and the agricultural squeeze hypothesis

There are significant differences among sub-Saharan African economies in terms of size, resource endowments, systems of economic management, nature of economic specialisation and the degree of economic diversification. The agricultural systems of production within each country also have specificities of their own. Generalisations about 'sub-Saharan African agriculture' and general policy prescriptions derived therefrom are therefore likely to be misleading. However, the specificities of individual cases are sometimes better understood when viewed in a more general and comparative context. Above all, if there are any lessons for sub-Saharan Africa to be learnt from the historical experience of Asian countries, it is important to start with such a panoramic view of the characteristics of the economies in the two regions. We shall therefore start by addressing the question of whether the post-colonial sub-Saharan African economies, despite their differences, have any common characteristics which could distinguish them from the Asian economies. We focus particularly on the role of agriculture and the nature of economic duality in the two regions.

Some of the similarities and differences in the initial conditions in the two regions are highlighted in Table 1, which compares certain structural features of the post-colonial sub-Saharan African economies with Asian ones.¹ As the table shows, in 1965 on average well over 80% of the population in sub-Saharan Africa were rural, and a similar proportion of the labour force worked in agriculture. Though in terms of rural concentration of population there does not seem to be a significant difference between the post-colonial sub-Saharan Africa and Asia, employment shares indicate a higher degree of diversification of Asian economies. In terms of primary commodity export orientation also there does not seem to be a significant difference between the two regions, though the sub-Saharan African economies on average seem to have been more dependent on agricultural exports than were the Asian countries. These are of course average patterns, which hide important individual country exceptions within both the regions. Throughout this paper,

¹ The averages shown in Table 1 refer to 28 countries in sub-Saharan Africa and ten Asian countries as listed in the footnote to the table. The 28 countries have been chosen so that they contain the various economy types distinguished amongst post-colonial sub-Saharan countries in the literature (see, e.g., Szentes, 1969, 1978, for one such typology). The ten Asian countries contain most of the population in developing countries in Asia.

Table 1. Selected agricultural indicators in Sub-Saharan Africa and Asia

	I	II		III	IV	V	
	Rural population (%) 1965	Employment (%)		Share of agriculture in GNP (%) ^a 1965	V-ratio ^b 1965	Share of exports (%)	
		Agriculture 1965	Industry 1965			Primary 1970	Agriculture 1970
<i>Sub-Saharan Africa</i> ^c							
1st Quartile	76.8	80.3	3.1	28.9	6.9	87.5	50.7
Median	87.2	86.2	4.7	42.2	9.8	93.6	81.0
3rd Quartile	93.3	89.5	7.9	46.9	14.7	98.6	91.0
<i>Asia</i> ^d							
1st Quartile	71.7	58.1	8.4	29.1	22.6	70.3	38.1
Median	80.7	65.2	12.5	37.7	28.3	92.1	54.4
2nd Quartile	83.6	78.8	14.8	43.1	41.6	98.5	66.2
Africa (mean)	84.5	82.5	6.3	38.1	13.2	87.3	68.3
Asia (mean)	79.1	67.7	11.5	38.2	30.6	78.8	53.9
<i>t</i> -test for the difference between the means	1.61	3.38	-2.92	-0.04	-3.53	0.90	1.40

^a Share of agricultural value added in total GDP.

^b Value added per agricultural worker as a percentage of value added per head in the non-agricultural sector.

^c Refers to the following 28 African countries: Benin, Botswana, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Cote d'Ivoire, Gambia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Senegal, Sierra Leone, South Africa, Sudan, Tanzania, Uganda, Zaire, Zambia, Zimbabwe.

^d Refers to the following 10 Asian Countries: Bangladesh, China, India, Indonesia, South Korea, Malaysia, Pakistan, Philippines, Sri Lanka and Thailand.

Source: World Bank, *World Development Indicators*, 1997.

we shall concentrate on this type of average regional data that show overall regional tendencies, but will point out individual country exceptions which have a significant bearing on the argument being made.¹

What really stands out in Table 1, as a glaring difference between the two regions, is the apparent economic duality between agriculture and non-agriculture, as reflected in the value added shares in agriculture in the two regions relative to the share of the agricultural labour force. This is shown in column 4 of the table under the heading of 'V-ratio', which measures the value added per agricultural worker as a percentage of value added per worker in the non-agricultural sector at current prices. The median for this ratio in sub-Saharan Africa is below 10%, while in Asia it is over 28%. In sub-Saharan Africa, only South Africa, Nigeria and Ghana had relative value added shares close to Asia (over 20%) in the mid-1960s. The trends in V-ratio shown in Table 2 also indicate that the average for sub-Saharan Africa remains well below Asia for the entire period, though there is a steady increase in this variable in the case of Africa, particularly noticeable since the early 1980s.

What are the reasons for the low V-ratios in sub-Saharan African economies relative to those in Asia? This question was first raised by Lipton (1977) in the context of developing

¹ For data and more detailed discussion at the individual country level, see Karshenas (1998).

Table 2. Trends in value added ratio in sub-Saharan Africa and Asia, 1965–95

	V-ratio (%) ^a						
	1965–66	1970–71	1975–76	1980–81	1985–86	1990–91	1994–95
<i>Median</i>							
Sub-Saharan Africa	8.8	9.8	10.3	11.3	11.7	13.5	16.6
Asia	27.1	30.7	31.4	26.5	28.2	28.2	27.0
<i>Mean</i>							
Sub-Saharan Africa	12.4	13.6	16.2	16.5	17.6	19.0	21.3
Asia	31.1	30.5	32.4	27.4	29.9	30.7	29.8
<i>t</i> -test for the difference between the means	-4.2	-4.3	-3.7	-2.7	-2.6	-2.1	-1.5

^a Value added per agricultural worker as a percentage of value added per head in the non-agricultural sector at current prices.

Averages refer to countries listed in Table 1.

Source: As Table 1.

countries in general, while he also pointed out the extremely low ratios for African countries relative to other developing countries. In a more recent paper, Lipton has reiterated the point in the specific context of Africa (Lipton, 1987). In the absence of any other explanations he puts this down to the effect of over-taxation of agriculture and the ‘urban bias’ of government policies in these economies.¹ The low *V*-ratios may also appear to conform with the more popular notions of economic duality in sub-Saharan Africa and the ‘plundering of agriculture’ à la Schiff and Valdes (1992). It is difficult, however, to believe that during the 1960s some of the sparsely populated countries in sub-Saharan Africa with rich mineral exports (e.g., Zaire or Zambia) taxed their agriculture more than some of the densely populated, resource poor, countries in Asia (e.g., Bangladesh, India, Sri Lanka).² Furthermore, the behaviour of the *V*-ratio in sub-Saharan Africa during the post-colonial period also does not seem to support the urban bias or the agricultural squeeze hypotheses. To see this, it would be helpful to write the relative productivity ratio, or the *V*-ratio, as:

$$V\text{-ratio} = \frac{V_a/L_a}{V_n/L_n} = \frac{P_a}{P_n} \frac{Q_a/Q_a}{Q_n/Q_n} = \frac{P_a}{P_n} \frac{e_a}{e_n}$$

where V_i , L_i , Q_i , and P_i respectively refer to value added, employment, real value added and prices in the relevant sectors (agriculture and non-agriculture), and e_i refers to real labour productivity. Denoting the rates of change by a dot above the variables, we can decompose the rate of change in the *V*-ratio as:

$$\dot{V}\text{-ratio} = \dot{e}_a - \dot{e}_n + \dot{T}$$

where T is the agricultural terms of trade or the P_a/P_n ratio. The change in the *V*-ratio is therefore equal to the change in agricultural labour productivity, minus labour product-

¹ After a search for different possible explanations, Lipton (1977, p. 163) concluded, ‘Neither historical compulsions, then, nor the specific features of groups of LDCs, can account for today’s huge and on balance growing disparities [in *V*-ratios]’. He then goes on to assert that ‘Urban biases in private and public power, and hence in pricing and resource allocation, are needed to explain high disparities . . .’

² A precautionary note on data is in order here. The *V*-ratios in Africa are likely to be subject to large measurement errors arising from underestimation of output and possible overestimation of employment data. However, as I have argued in Karshenas (1998, pp. 29–30) in detail, the possible inaccuracies of data are unlikely to give rise to the large observed differences in the *V*-ratios between Africa and Asia.

Table 3. *Decomposition of the trends in value added ratio in sub-Saharan Africa and Asia, 1965–95*

	Trend growth rates in: Labour productivity				Trend growth rates in: Labour productivity			
	<i>V</i> -ratio ^a	Agricult.	Non-Agr.	Relative price ^b	<i>V</i> -ratio ^a	Agricult.	Non-Agr.	Relative price ^b
	1965–80	1965–80	1965–80	1965–80	1980–95	1980–95	1980–95	1980–95
<i>Median</i>								
Sub-Saharan Africa	1.4	0.2	-0.5	0.6	2.9	0.4	-2.2	0.1
Asia	-0.6	1.3	2.4	1.3	0.0	2.1	2.5	0.8
<i>Mean</i>								
Sub-Saharan Africa	1.9	0.2	-0.3	1.3	1.9	0.4	-2.1	-0.6
Asia	-0.5	1.6	3.0	0.8	-0.2	2.4	2.8	0.2
<i>t</i> -test for the difference between the means	2.30	-1.91	-3.69	0.60	2.22	-2.85	-4.48	-1.14
<i>Percentage of countries with negative growth rate</i>								
Sub-Saharan Africa	27	48	52	24	25	46	82	50
Asia	50	10	0	30	50	0	20	30

^a Value added per agricultural worker as a percentage of value added per worker in the non-agricultural sector.

^b Terms of trade is calculated as the residual of trend growth rates in other variables at individual country level.

Averages refer to the countries listed in Table 1.

Source: As Table 1.

ivity growth in the non-agricultural sector, plus the improvement in agricultural terms of trade.

The average estimates of these variables for sub-Saharan Africa and Asia for 1965–80 and 1980–95 are shown in Table 3. A number of important contrasting tendencies in Africa and Asia stand out. First, during the 1965–80 period, which is believed to be the period in which African agriculture was being increasingly taxed through the terms of trade effect, the *V*-ratios in most sub-Saharan African economies showed rising trends. In fact, a declining *V*-ratio in this period was more a common trait of Asian countries than the sub-Saharan African ones. Furthermore, in a few countries in sub-Saharan Africa where the *V*-ratios showed significant declines during the 1965–80 period (namely, Burkina Faso, Congo, Lesotho, Mali, Niger and Nigeria), only in one country, namely Niger, was there a significant deterioration in the agricultural terms of trade as hypothesised by the agricultural squeeze hypothesis (see Karshenas, 1998).

Another result shown in Table 3, with regard to the 1980–95 period, is that a significant part of the increase in the *V*-ratio for most sub-Saharan African economies during this latter period seems to be explained by the collapse of labour productivity in the non-agricultural sector. The median for the non-agricultural productivity growth for the sample countries in sub-Saharan Africa was -2.2, in contrast to a 2.5% growth for Asia. Of the 28 sub-Saharan countries in the sample, only five achieved positive non-agricultural productivity growth rates during the 1980–95 period, and only four of them showed non-agricultural

Table 4. *Labour/land ratio and population growth in sub-Saharan Africa and Asia, 1965–94*

	Labour/land ratio ^a		% Land ^b under crops	Population growth rates ^c	
	1965	1994		1965–94	Total 1965–94
<i>Sub-Saharan Africa</i>					
1st Quartile	46	110	8	1.7	2.6
Median	158	236	16	2.3	2.8
3rd Quartile	295	396	33	2.6	3.1
<i>Asia</i>					
1st Quartile	776	980	81	1.2	1.7
Median	900	1113	90	1.4	2.1
2nd Quartile	1012	1409	95	1.9	2.4
Africa (mean)	198	319	24	2.1	2.9
Asia (mean)	1024	1358	83	1.2	2.1
<i>t</i> -test for the difference between the means	-4.47	-3.32	-7.58	2.00	4.20

^a Labour/land ratio is defined as persons per hectare of agricultural land (arable land plus pastures).

^b Percentage agricultural land under annual and permanent crops (including fallow).

^c Growth rates refer to annual trend growth rates. Averages refer to the countries listed in Table 1.

Source: FAOSTAT, FAO.

productivity growth rates which were higher than productivity growth in agriculture. This meant that, despite the negative terms of trade effect for agriculture in at least half of the sample countries in Africa, most countries achieved increasing *V*-ratios during the 1980–95 period (Table 3). It would be difficult to reconcile these observations with the popular notions of an agricultural squeeze hypothesis in post-colonial sub-Saharan Africa. In this paper, we argue that the relatively low *V*-ratios in Africa are predominantly explained by the structural characteristics of the agrarian economies in sub-Saharan Africa in contrast to Asia. In order to investigate such structural explanations of the *V*-ratio gap between Africa and Asia, we need a more detailed investigation of the initial conditions of the agrarian economies of the two regions.

2.1 *Agrarian relations and regional wage differentials*

Some of the basic differences between the Asian and the sub-Saharan African agricultural systems arise from the much higher population pressure on land in Asia as compared with Africa. This is reflected in the data in the first two columns of Table 4, which show labour/land ratios in sub-Saharan Africa and Asia for 1965 and 1994. The number of labourers per hectare of agricultural land was on average five times higher in Asia than in sub-Saharan Africa in 1965. The agricultural population in Africa are not of course uniformly spread across wide tracts of agricultural land. As can be seen in the third column of the table, on average, only about 24% of the agricultural land in the sample countries in sub-Saharan Africa in the mid-1960s is cultivated land. The rest is composed of pasture, which is partly used for herding and hunting/gathering, and partly unutilised. This does not mean that all or even most of the remaining pasture is readily cultivable, or suitable for cultivation at all.¹ The figures nevertheless help to delineate the difference in the predomi-

¹ For a detailed discussion of the various degrees of suitability of agricultural land for cultivation in different sub-Saharan African countries, see Food and Agricultural Organization (FAO) (1986).

Table 5. *Irrigation ratio, fertiliser and tractor use in sub-Saharan Africa and Asia, 1965–94*

	Fertiliser consumption			Irrigation ratio			Tractors in use		
	1965	1980	1994	1965	1980	1994	1965	1980	1994
<i>Median</i>									
Sub-Saharan Africa	1.9	6.4	7.5	0.5	0.9	1.3	3.1	8.4	10.3
Asia	25.0	65.2	141.1	27.1	32.0	38.9	3.9	23.2	77.1
<i>Mean</i>									
Sub-Saharan Africa	4.8	12.9	12.7	2.2	3.8	4.6	14.5	19.9	22.3
Asia	46.3	147.1	237.3	29.5	38.3	43.8	15.4	55.6	146.4
<i>t</i> -test for the difference between									
the means	-2.21	-2.73	-3.48	-4.75	-5.10	-5.51	-0.09	-1.33	-2.49
South Africa	29.8	85.6	51.3	7.3	9.1	8.7	113.5	138.8	85.9

^a Figures refer to kg per ha of fertiliser use, percentage of irrigated land, and tractors per 10,000 ha (per arable land).

Regional averages refer to the countries listed in Table 1.

Source: FAOSTAT, FAO.

nant systems of farming in the two regions; namely, extensive farming in post-colonial sub-Saharan Africa, where smallholder agriculture was based on shifting cultivation and where the main constraint to output expansion was labour and labour-augmenting technological possibilities, and intensive farming in Asia where land, and land-augmenting technological possibilities, formed the main constraints to growth.¹ This is further reflected in the patterns of investment and input use in the agricultural sectors in the two continents.

In Asia, where most countries had already reached the limits of agricultural land frontiers in the 1960s, and with enormous population pressure on land, agricultural growth has been based on land-augmenting but labour-intensive seed/fertiliser technology of the green revolution and multiple cropping methods. This is reflected in high rates of fertiliser use and irrigation in Asia in contrast to sub-Saharan Africa, as shown in Table 5. In 1965, the median irrigation rate in Asia was 50 times higher, and fertiliser use was more than ten times higher than in sub-Saharan Africa. Tractor use, which is a relatively more labour-saving rather than land-augmenting device, was on the other hand more or less at par between the two regions in 1965. These input–use ratios, of course, should not be viewed as fixed technological coefficients appropriate to given systems of farming. There is, for example, no reason why extensive farming cannot benefit from higher fertiliser use, or irrigation, which can increase productivity of both land and labour. The example of extensive farming in the highly capitalised South African agriculture, with much higher fertiliser use than the African average, is a case in point (Table 5). The low input–use ratios for sub-Saharan Africa are therefore also indications of low investment and the undercapitalisation of agriculture in the region. This is highlighted by the rapidly widening gap in input use (whether of the seed/fertiliser type or tractors and machinery) between Asia and Africa during the 1965–94 period (Table 5), which also explains the significant differences in agricultural labour productivity growth rates between the two regions observed in the

¹ The classic work on the links between population density and the type of agricultural technology is Boserup (1965), where a more detailed classification of the system of land use and its links with population density is given.

Table 6. Output, land and labour productivity in sub-Saharan African and Asian Agriculture, 1965–94

	Labour/ Output Land Ratio		Output/Land Ratio			Output/Labour Ratio		
	1965	1965	1965	1980	1994	1965	1980	1994
<i>Median</i>								
Sub-Saharan Africa	4	153	307	406	516	2265	2343	2541
Asia	37	900	2777	3744	5281	2887	4070	4032
<i>Mean</i>								
Sub-Saharan Africa	8	198	484	555	794	2905	3337	3690
Asia	192	1024	3112	4730	6629	3234	4597	7608
<i>t</i> -test for the difference between the means	–	–	–4.54	–3.94	–3.51	–0.40	–0.79	–1.24
South Africa	23.6	24	307	471	495	11724.6	23548.6	25639

Notes: Output is measured in wheat equivalent units in mn tons in 1980 world relative prices. Land and labour productivity are in kg per hectare and per economically active population in wheat equivalent units. Medians and means refer to the countries in Table 1. Means are simple averages.

Source: Karshenas (1998) and FAOSTAT, FAO.

previous section. Of course, investment growth in agriculture itself depends, amongst other things, on the availability of new productive technologies that can help maintain the profitability of investment in the sector.

The above picture is in conformity with the basic stylised facts about the technological level of sub-Saharan African agriculture discussed in the literature, namely that, with a few exceptions, it predominantly consists of small farmers using simple technologies and with little use of modern inputs. It would be wrong, however, to conclude on this basis that the level of labour productivity in sub-Saharan African agriculture in the early years of the post-colonial period was much lower than in Asia. It would certainly be plausible to assume that land productivity in extensive agriculture of sub-Saharan African type would be lower than intensive farming in Asia, but the same does not hold for labour productivity because lower yields can be compensated by higher land/labour ratios. This was indeed the case, as can be seen from Table 6 which shows land and labour productivity in the two regions in comparable (wheat equivalent) units. As shown in the table, in 1965 average land productivity in Asia was eight times higher than the average for sub-Saharan Africa, but labour productivity levels in the two regions were not significantly different. In fact, labour productivity levels in most African countries in 1965 were higher than the least developed countries in Asia such as Bangladesh, China, India and Indonesia (Karshenas, 1998). Of course in the subsequent period, with the much higher rates of productivity growth in Asia, the labour productivity gap between the two regions widens rapidly (Table 6). Thus any explanation of the lower *V*-ratios in Africa in the 1960s has to start from the premise that the average productivity of labour in agriculture in the two regions in the immediate post-colonial period was similar. We therefore need to investigate further the initial conditions in the agrarian structures of the two regions, which may help to explain the differences in *V*-ratios.

Some of the fundamental differences between the Asian and sub-Saharan African agricultural systems pertain to the prevailing relations of production, namely, the patterns of ownership and control of land and other productive assets, and organisation of labour, in the two regions. Asian agriculture, given its high population density, by and large consists of highly differentiated peasant ownership structures, with a large part of the agricultural labour force taking the form of landless labourers or poor peasant farmers with the major part of their livelihood taking the form of wage income. Rural wages in these economies are well below the average product of labour. It was in fact in relation to these economies that the dual economy models, or the surplus labour economy models, of the 1950s and the 1960s were formulated (e.g., Lewis, 1954; Fei and Ranis, 1964). The post-colonial land-abundant sub-Saharan economies, on the other hand, have more limited development of wage labour in agricultural production. Possession of agricultural land by individual farmers has been predominantly through some kind of communal arrangement or traditional customary rights, with family labour being the main form of agricultural labour. The low level of development of wage labour has been due to the ease of access to the main productive asset in agriculture, namely land. This of course should not be regarded as simply a result of prevailing factor proportions or land/labour ratios, but essentially as the reflection of the existing agrarian relations. The case of South Africa is a good example of this point. Despite low levels of labour/land ratios, South Africa, through forced eviction of its indigenous agricultural population and colonisation of new lands, managed to establish a highly mechanised and commercialised farming sector with a predominant use of wage labour and extremely high levels of labour productivity (Table 6). This also generated surplus labour, mainly residing in labour camps and labour reserve towns, which solved the labour shortage problem of the non-agricultural sector. The transformation of production conditions in agriculture in South Africa was not simply a matter of availability of capital to be substituted for labour either. It was first and foremost a forced transformation of agrarian relations and generation of surplus labour.

The lack of development of a landless wage labouring class can be of fundamental importance in explaining the behaviour of V -ratios.¹ In Asia, the non-agricultural sectors have had access to an abundant supply of wage labour at wage rates that are a fraction of the average product of labour in agriculture, and with a relatively elastic supply. In sub-Saharan Africa, on the other hand, the opportunity cost of labour or the reservation wage for the non-agricultural sector is close to the average product of labour in agriculture. This is because, under the institutional arrangements of sub-Saharan African agriculture, the individual farmer appropriates the total product, and the rental market for agricultural land is undeveloped. This can imply a substantial differential in the two regions in non-agricultural wages relative to average productivity in agriculture.

Before proceeding to investigate the implications of this for the relative V -ratios in the two regions, it would be helpful to form some approximate idea about the orders of magnitude involved. According to estimates by Mellor and Ranade quoted in Delgado and Ranade (1987), the share of labour in agriculture in Maharashtra (India) was 15%. Of course there are variations in factor shares across different regions in India, as there are

¹ The above characterisation of the predominant agrarian relations in sub-Saharan Africa is based on Binswanger and McIntire (1987) and Hayami and Platteau (1997). This is, of course, an oversimplified stylised picture, which does not apply to all parts of the sub-Saharan Africa or even to all parts of any individual country in the region. The picture has been also changing very rapidly with fast rates of population growth. However, as a stylised characterisation of sub-Saharan smallholder agriculture in the immediate post-colonial period, and in contrast to Asian agriculture, this is a permissible generalisation.

Table 7. *Manufacturing wages in sub-Saharan Africa and Asia, 1965–94*

	In US\$ at official exchange rates			Consumption wages at PPP Exchange rate ^a			Real wage index ^b		
	1965–70	1975–80	1985–90	1965–70	1975–80	1985–90	1965–70	1975–80	1985–90
<i>Median</i>									
Africa	700	2593	1692	180	330	508	98	100	88
Asia	402	741	1215	100	197	454	82	100	133
<i>Mean</i>									
Africa	861	2459	2506	162	349	494	109	100	85
Asia	433	901	2037	107	206	509	87	100	145
<i>t</i> -test for difference between the means	3.95	4.48	0.53	2.43	3.21	-0.13	1.60	—	-4.15

^a Consumption wages are indices with Asia median=100, evaluated at PPP consumption exchange rate.

^b Wages deflated by domestic consumer price index. Indices refer to period averages.

Source: UNIDO, INDSTAT 1996, World Penn Tables Mark 5.6, and World Economic Indicators, World Bank.

across different countries in Asia.¹ But even if we assume a labour share as high as 50% on average in Asian agriculture, and take into consideration also that average labour productivities in the agricultural sectors in the two regions in 1965 were more or less equal, the above argument implies a non-agricultural reservation wage rate in sub-Saharan Africa which is at least 100% higher than in Asia. With a less conservative, but perhaps more realistic, assumption of wage rates in Asian surplus labour agriculture being 30% of the average product of labour, and in Africa 90%, the reservation wages for African non-agricultural sector would be three times higher than for Asia in 1965. These are of course very inexact estimates, but they nevertheless provide an idea of the plausible ranges of the orders of magnitude involved. It would be instructive to compare these with some of the available evidence on wage differentials between Asia and sub-Saharan Africa.

Table 7 shows average wages in the manufacturing sector in our sample countries in Asia and Africa. Wage rates are calculated as total compensation of labour divided by the number of workers. The first broad column in the table shows wage rates in US dollars converted at official exchange rates. During the latter half of the 1960s, wages in sub-Saharan countries for which data are available were on average more than 90% higher than in Asia. Despite the considerable variations within regions, the average for Africa is significantly more than for Asia. During the 1970s, the wage gap between the two regions widens considerably before it narrows down sharply in the 1980s. These figures, evaluated at official exchange rates, are not of course appropriate indicators of the variations in wages in real purchasing power terms across countries, or over time. The second broad column of the table shows consumption wages in purchasing power parity terms in different countries. When valued in purchasing power parity terms, the median wage gap between the two regions during the 1970s narrows considerably down to the same order of magnitude as in the 1965–70 period and, by the late 1980s, the wage gap almost vanishes. While comparable across the countries, these figures are not appropriate indicators of real wage

¹ Maharashtra, in fact, has one of the lowest population land ratios amongst Indian states. India's labour/land ratio is close to the median in Asia.

changes over time. The third broad column of Table 7 shows the real wage indices (deflated by the domestic consumer price index), which indicate the movement of real wages in different sample countries over time. Wage increases in Africa during the 1970s were not on average different from those of Asia, and during the 1980s recession, real wages in Africa witnessed a precipitous decline.

These wage differentials, which are in line with other evidence on wages in sub-Saharan Africa (see, e.g., Teranishi, 1997), highlight a number of important points. First, the average wage differentials in the 1960s were not higher than the expected ranges derived from a priori reasoning above, based on the agrarian structures and agricultural productivities in the two regions. Secondly, the 1960s wage differentials and the movement of wages in the subsequent period do not support the commonly held view that the power of labour unions or urban interest groups were the main reasons for wage differential between the two regions. In fact, real wages in the recessionary period of the 1980s in sub-Saharan Africa have shown remarkable flexibility.¹ Once we take into account the differences in agrarian conditions in the two regions, it appears that, in order to explain the wage differentials between Asia and Africa, one does not need to invoke arguments about urban bias, government wage legislation or union power in post-colonial sub-Saharan Africa.

The implications for the relative magnitudes of the V -ratios in Asia and Africa are straightforward. Starting with a closed-economy situation, on average, wages in the non-agricultural sector in post-colonial sub-Saharan Africa would be much higher than in Asia relative to agricultural prices. Assuming the same non-agricultural technologies in the two regions, non-agricultural prices relative to agricultural prices in Africa would also be proportionately higher. Technologies in the non-agricultural sectors of the two regions, however, would not be the same. In Africa, higher wages would induce the use of labour-saving technologies with a much higher capital intensity as compared with Asia. This would increase labour productivity in non-agriculture relative to agriculture in Africa and hence push down V -ratios further. Depending on the degree of protection of the non-agricultural economy and the prevailing market structures, this effect may be somewhat alleviated if higher labour productivity in the non-agricultural sector somewhat reduces the relative price differentials between agriculture and non-agriculture in favour of agricultural products.

This is of course a simple account of matters in a closed economy context. There are further technical aspects of agricultural production in sub-Saharan Africa which would help explain lower observed V -ratios relative to Asia. These arise from climatic conditions which introduce a high degree of seasonality of agricultural labour in sub-Saharan Africa compared with Asia (see Delgado and Ranade, 1987). This would not have affected the V -ratios if productivity measurements were done in terms of hours of work. However, since the observed V -ratios are measured in terms of relative value added per labourer, the shorter agricultural season would *ceteris paribus* reduce the observed ratios in Africa relative to those in Asia. V -ratios measured in value added per person year would increase with the growth of irrigation, multiple cropping, and the development of intensive farming, which would spread agricultural labour more uniformly over the year, that is, as the regularity of agricultural work approaches that of non-agriculture.

Relaxing the assumption of a closed economy would not change the picture dramatically. In economies where the non-agricultural sector is protected, as was the case in most

¹ For a more detailed discussion of this point, using a larger sample of developing countries, see Karshenas (1997). The behaviour of wages in Africa shows considerable flexibility compared with, for example, the behaviour of wages in Latin America during the 1980s recession.

countries under study here, the availability of more capital-intensive imported technology would help compensate for high non-agricultural wages in the sub-Saharan-type economies by increasing labour productivity, and would hence push the V -ratio even further down. Even under free trade, as long as the prevailing agrarian institutions remain intact, the differentials in V -ratios between Asian and African-type economies would remain high, because most of the non-agricultural output in fact consists of non-tradable services. However, in sub-Saharan African-type economies which over the years have built up a sizeable non-agricultural sector under protection, a sudden liberalisation of trade would have a dramatic effect, as these countries will soon find out that none of their non-agricultural industries, even if they are technically efficient by international standards, could survive international competition from lower wage Asian-type economies. The opening up of such economies to international competition would have a strong deflationary effect on the non-agricultural economy in the short and medium run. The resulting recession in the non-agricultural economy would lead to an increase in the V -ratio by both depressing non-agricultural real wages and reducing non-agricultural output and productivity. With the resumption of growth, however, the V -ratios would once again tend to their 'normal' levels. Such 'normal' levels would of course be changing in the long run with population growth, agrarian change and particularly with the introduction of labour-saving investments in agriculture.

Once the surplus labour effect or the effect of the differential agrarian structures across the countries is taken into account, the relatively low V -ratios in sub-Saharan Africa no longer appear puzzling. What does require explanation in this new context is why the V -ratios in countries such as Ghana, Nigeria and South Africa amongst the African countries were so high. The case of South Africa should be clear by now. As noted above, it has a totally different agrarian structure as compared with other countries in Africa, or Asia for that matter. Other outliers such as Ghana and Nigeria need specific country analysis. It would be absurd, however, to conclude on the basis of the high V -ratios in Ghana and Nigeria that in these countries the non-agricultural sectors are 'plundered' by agriculture, in the same way as it is absurd to maintain that low V -ratios are indicative of the agricultural sector being 'plundered'.

3. Agriculture and economic development with a limited supply of labour

With the high rates of unemployment and underemployment of labour currently visible in urban centres in most sub-Saharan African economies, and the fast rates of population growth which are putting increasing pressure on fragile soils in African agriculture, to refer to these economies as labour-constrained economies may appear paradoxical. Labour constraints, however, are best highlighted in the context of resource requirements for sustained growth rather than the current state of employment in the crisis-ridden African urban economies. This can be best seen in relation to the historical experience of growth in post-colonial sub-Saharan Africa in comparison with surplus labour economies in Asia. One instructive comparison is the episode of rapid growth during the 1970s in Nigeria, the most populous country in sub-Saharan Africa, with that of Indonesia in the Far East. The two countries are oil-exporting economies of similar sizes, but with the difference that Indonesian agriculture has labour/land ratios which are three times those of Nigeria. The prevalence of shifting cultivation which has been a common form of smallholder agricultural production in Nigeria, and the fact that according to available estimates cultivated land in Nigeria could be doubled with the prevailing techniques if the labour

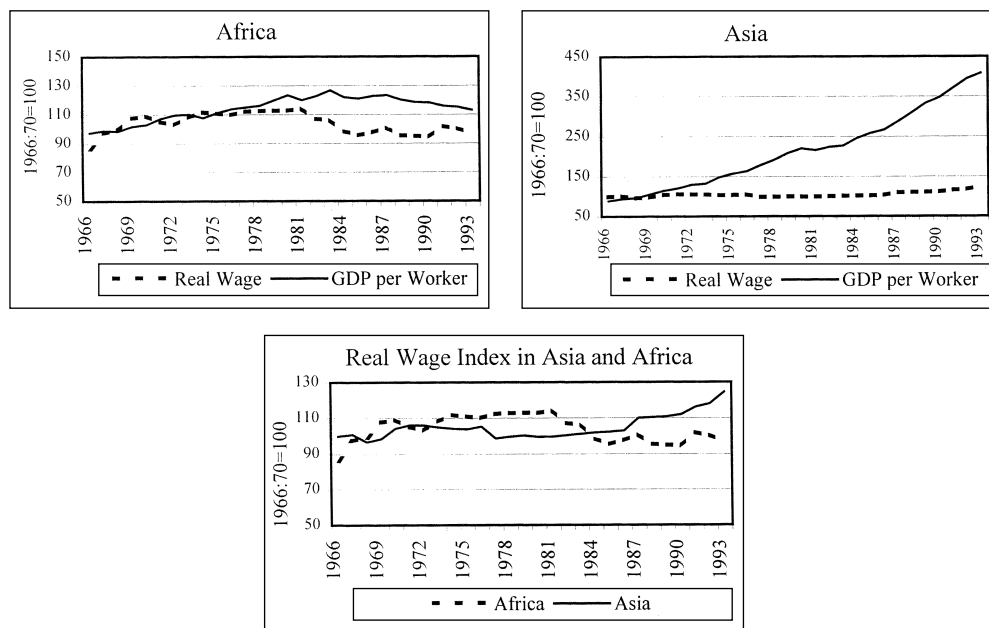


Fig. 1. Real wage and real GDP per worker indices for sub-Saharan Africa and Asia, 1966–92.

Notes: Indices refer to simple averages for sample countries. List of countries as in Table 1.

Source: Karshenas, 1998.

were available, signify the labour-constrained nature of Nigerian agriculture (Oyejide, 1986). On the one hand, the oil boom of the 1970s, which led to a rapid growth of investment in the Nigerian economy, induced a substantial increase in real wages and an inflow of millions of immigrant labourers from neighbouring countries. On the other hand, the surplus labour economy of Indonesia, throughout a long period of rapid and sustained economic growth during the 1970s and the 1980s, has shown moderate increases in real wages and has remained a net labour-exporting country.¹

This phenomenon can also be seen at a more general regional level, by examining the trends in real wages and GDP per worker in the two regions shown in Figure 1. The two variables are measured as simple averages of the indices of real GDP per worker and real manufacturing wages (deflated by consumer price index) for the countries in the two regions, as listed in Table 1. There are, of course, considerable variations in individual country experiences within each region, which necessitate extra care in making generalisations on the basis of simple regional averages shown in the figure. The contrasting regional trends shown by the graphs are nevertheless representative of the experience of many, if not all, the countries in the two respective regions.

It can be seen from the top graph that in sub-Saharan Africa during the growth period of 1965–80, real wages grow more or less in line with the growth of labour productivity, and it is only during the slowdown of the 1980s and the deep recession in the non-agricultural urban economy that wages fall behind GDP per worker trends. In Asia, on the other hand,

¹ On labour migration in Indonesia and other Pacific Asian countries, see Fong (1993). The difference in economic performance between the two countries in the post-oil boom era, which inevitably involved a revaluation of the Nigerian currency relative to the Indonesian one, has in some of the literature been mistakenly attributed to the difference in exchange rate policies in the two countries.

productivity growth surges ahead of real wage growth throughout a long period of rapid and sustained economic growth. The behaviour of real wage/productivity trends in Asia has a remarkable similarity to the trends envisioned by the surplus labour, dual economy models of the 1950s and the 1960s.¹ The existence of surplus labour in Asian agriculture has been part of the reason for the possibility of generation of the wage/productivity trends seen in Figure 1. The other part has been the ability of agriculture, through investment and a constant introduction of new technologies, to provide the cheap food and raw materials necessary for the growth of employment in other sectors and for the feeding of a growing population in general. Without this latter condition being met, the growth of employment, output and productivity in the economy would have been choked in its early stages by increasing food prices and erosion of investable surpluses in the rest of the economy. The African wage/productivity path during its growth period of 1965–80, shown in the graph, is due to the fact that one or the other, and in the majority of cases both, of these conditions failed to be met in a large part of that continent.

The fact that the reservation wage in the non-agricultural sector in post-colonial sub-Saharan Africa was close to the average product of labour in agriculture, also meant that the transfer of labour from agriculture would lead to a decline in agricultural output more or less equivalent to the reservation wage of the transferred labourer. This is, of course, due to the institutional and technological characteristics of sub-Saharan agriculture, which, to begin with, we may assume as given. A large-scale investment effort, as was certainly needed and also envisaged in the post-colonial euphoria in sub-Saharan Africa, would under such conditions lead to large increases in the demand for food outside agriculture while, at least in the short-run, the supply of food would be constrained because of the shift of labour out of agriculture. Under these circumstances, whether by government design or under the operation of market forces, the rising demand for agricultural output for domestic use would undermine the profitability of cash crop exports and would shift the composition of agricultural output towards domestically consumed goods. Wages and the prices of domestically consumed agricultural products would increase relative to the prices of export cash crops and non-agricultural products. This is not of course a sustainable process. But to the extent that the country can rely on external loans to cover the balance of payments gap, the government may be able to maintain the investment process by bolstering profit margins in non-agricultural activities through cheapening the labour cost by food subsidies. To the extent that such policies lead to further increase in demand for labour outside agriculture, it could further lead to a contraction of agriculture (or a slow down in its growth in an economy with population growth), particularly of the agricultural export sector. In this type of labour-constrained growth process, real wage increases relative to labour productivity growth would be inevitably much higher than in the Asian-type surplus labour economies. The build-up of foreign debt would, however, bring this type of growth process to an end sooner or later.

This scenario of the growth process in labour-constrained economies, however, is by no means inevitable. The above chain of reasoning started from the key assumption that the

¹ It should be remembered, of course, that the trends shown in these graphs relate to real wages in manufacturing, while productivity figures are for the economy as a whole. To the extent that manufacturing productivity has increased more than the other sectors in Asia, the divergence between real wages and productivity growth paths would be even more pronounced. The same probably holds for Africa during its growth period, where manufacturing productivity growth is likely to have been above the other sectors. During the 1980s recession in Africa, however, it is more likely that output and productivity decline in manufacturing has been more pronounced than the other sectors and hence the widening gap between real wages and manufacturing productivity would not be as pronounced as in the figures.

technology of production in the agricultural sector was given. However, with the possibility of introducing labour-saving technologies that can continuously increase the productivity of labour in agriculture as labour increasingly moves to the non-agricultural sectors, there is no reason why the sub-Saharan-type economies could not follow similar growth processes to those in the surplus labour Asian economies. Apart from the nature of their resource availabilities and factor proportions, therefore, the possibilities of introducing labour-saving technological change in agriculture should be considered an important part of the definition of, and growth prospects in, labour-constrained economies.

Those economists who consider price distortions as the main cause of African agricultural underdevelopment seem to assume that endogenous technological change under the pressure of market forces, given the right price signals, would have automatically taken care of the necessary technological transformations. They would argue that, for example, in the above scenario of growth, rising non-agricultural product wages and relative prices of domestically consumed agricultural products would induce greater investment in agriculture and greater utilisation of labour-saving technologies in the sector. The fact that this did not take place in sub-Saharan Africa is argued to be because of the price distortions introduced by government food subsidies and protection of non-agricultural sectors. This argument, however, ignores some of the important structural features of sub-Saharan African agriculture, features which may either weaken the transmission of price signals or may limit the ability of the producers to respond to the price signals in the desired manner. Predominant amongst such structural impediments, as emphasised by most specialists of African agriculture, are the backward state of the infrastructure which introduces prohibitive transaction costs for a large segment of small peasant food producers in the region, and the lack of ready availability of new technologies of production both suitable to the soil and climatic conditions in sub-Saharan Africa and at the same time adaptable to the conditions of small food producers in the region.

The poor state of sub-Saharan African infrastructure relative to Asia has been extensively discussed in the literature (see, e.g., Ahmed and Rustagi, 1984; Riverson, *et al.*, 1991; Ahmed and Donovan, 1992; Spencer, 1994; World Bank, 1996; Hayami and Platteau, 1997; Terranishi, 1997). The low population densities in most sub-Saharan African countries and the dispersion of the rural population over vast expanses of land are argued to have led to a low density of road networks and other communication links (Hayami and Platteau, 1997). Once one takes into account the quality of the roads and means of transport, the gap between sub-Saharan Africa and Asia widens further. This picture is repeated with perhaps even more intensity with respect to other infrastructural facilities such as electricity, telecommunications, health and sanitation etc. (see Ahmed and Donovan, 1992). The backward state of the infrastructure in sub-Saharan Africa has resulted in much higher transaction costs in agricultural trade as compared with Asia (Ahmed and Rustagi, 1984).

It has been argued that these high transaction costs, resulting in the first place from the lack of development of infrastructure, have substantially reduced the tradability of agricultural products for the larger part of the small producers in sub-Saharan Africa and, as far as international trade is concerned, transaction costs for the majority of small producers not in the vicinity of major ports have been prohibitive. According to Delgado (1997, p.156), this 'semi-open' character of sub-Saharan African agriculture is because 'transport and other marketing costs for the bulky items in which they trade—including food staples and major exportables—end up doubling and tripling the price of exportables at the African dockside (f.o.b. price) relative to their price at the farm gate . . .'. This view,

which is shared by many other analysts of African agriculture (e.g., Koester, 1986; Jaeger, 1992; Jayne and Jones, 1997), partly explains the lack of response of agricultural prices and output to trade flows and to the movements of real exchange rate (see, e.g., Teranishi, 1997).

The second and related structural problem facing post-colonial sub-Saharan African agriculture pertained to the technological conditions of production and the possibilities of technological change. Emulation of Asian-type intensive farming, in addition to investment requirements for the development of economic infrastructure such as transport, power and irrigation, as well as new inputs such as fertilisers, seeds and pesticides, also required substantial new investments in research and extension services. The agro-climatic conditions in sub-Saharan African agriculture, which are different from Asia and at the same time highly varied across the different sub-regions, meant that a simple transplantation of the seed/fertiliser technology of the Asian green revolution without basic new research and development was impractical.¹ Without the development of appropriate new technological packages which could ensure adequate returns as well as stability of income for small farmers, other public investments in the agricultural infrastructure remain by and large ineffective.

As in the case of Asia, therefore, the development of small producer, intensive farming in sub-Saharan Africa required a substantial gross inflow of new inputs in the form of both fixed investment and producer goods from outside agriculture. A major difference between the two regions, however, was the much higher investment requirements in sub-Saharan African agriculture relative to the availability of resources. This constituted an important aspect of the structural problems of agriculture in Africa. The central institutions through which the post-colonial sub-Saharan African countries attempted to overcome some of these structural problems were the marketing boards. Marketing boards, inherited from colonial times, were strengthened in the post-colonial period and used, in addition to revenue-raising devices, as a mechanism for the provision of subsidised inputs, and transportation and marketing outlets for the small producers who were hitherto cut off from such provisions. As pointed out by Jayne and Jones (1997, p. 1521) in the context of East and Southern Africa, this 'became the cornerstone of an often explicit social contract made by the majority governments at independence in an attempt to redress the imbalances of the former colonial regimes'. The establishment of marketing board stations in remote regions and the policy of pan-territorial pricing, for example constituted a substantial subsidy to small producers, and of course a tax on producers with better infrastructure and market access. The grant of subsidised inputs and credits to producers in remote areas constituted a similar tax/subsidy mechanism. A large part of what in recent years has been referred to as the taxation of agriculture, thus took the form of a redistribution of income within agriculture through these implicit internal tax/subsidy mechanisms, rather than the 'plundering' of agriculture by the other sectors. This is particularly manifest in the rapid build-up in most countries of financial deficits by the marketing

¹ Thus according to Delgado and Mellor (1984, p. 666) 'the adaptive model of technology transfer will not be sufficient to deal with African problems'. According to Matlon and Spencer (1984, p. 672), 'Such differences [between Asian and African agriculture] help explain the lack of success to date in the direct introduction of exotic high-yielding cultivars, except for irrigated rice where the environment can be modified to suit the crop. For example, ICRISAT has had little success with direct introductions of Indian sorghum and millet varieties to West Africa. And after seven years of variety trials in which over 2000 varieties were imported for trials in the mangrove swamps of West Africa, the West African Rice Development Association found only two varieties that perform as well as the best local varieties.' On the technological conditions of production under different agroclimatic zones in sub-Saharan Africa, see Thomas and Whittington (1969), Malton (1987), Collinson (1987) and Kuile (1987).

Table 8. *Growth and variability in cereal and coarse grain yields in sub-Saharan Africa and Asia, 1961–95*

	Yield (kg/ha)		Trend growth rates		Annual variation		
	average	average	1961–75	1975–95	1961–71	1971–81	1981–95
	1961–65	1990–95					
<i>Cereals</i>							
Africa (median)	8.0	10.0	0.7	0.8	12.0	14.5	16.7
Asia (median)	15.3	28.1	2.2	2.0	7.1	5.6	4.5
Africa (mean)	8.1	10.2	0.5	0.7	15.5	19.0	22.5
Asia (mean)	16.3	30.9	2.2	2.1	6.9	6.9	5.8
t-test for difference between the means	-3.89	-5.08	-3.03	-3.39	2.84	3.53	5.47
<i>Coarse grains</i>							
Africa (median)	7.9	9.2	0.6	0.7	12.9	15.4	18.1
Asia (median)	7.6	14.1	1.4	2.2	10.4	7.5	6.9
Africa (mean)	7.6	9.2	0.2	0.5	16.4	20.6	24.1
Asia (mean)	10.5	19.4	1.9	2.2	11.4	11.4	7.6
t-test for difference between the means	-1.68	-2.62	-2.50	-3.58	1.36	2.05	5.08

^a Annual variation in yields is measured as the standard deviation of annual growth rates.

Regional averages refer to countries listed in Table 1. Means are simple averages.

Source: FAOSTAT, FAO.

boards from the mid-1970s, which meant that agriculture was becoming a growing burden on the rest of the economy.

This strategy seems to have been successful in smallholding areas where other complementary conditions, particularly improved technology and other supporting services, existed, e.g., the smallholder response to new varieties of maize in the so-called maize belt in Southern and Eastern Africa, tea in Kenya and cotton in southern Mali (Mellor *et al.*, 1987).¹ The problem with this strategy in many countries, however, was that in most cases these other complementary conditions were not met, and hence the subsidies to smallholders, to the extent that they actually did receive them, did not lead to noticeable productivity gains in agriculture. This can be seen from the poor performance in terms of growth and variability in yields for cereals and coarse grains in most sub-Saharan African countries, particularly compared with Asia, as shown in Table 8. The average cereal yields in sub-Saharan Africa as a whole, which were about 50% of those in Asia in the early 1960s, fell to 30% of the latter in the early 1990s. An even more disappointing picture is exhibited by the yields of coarse grains, which starting from a more or less equal average value as in Asia in the early 1960s, fell to less than half of the latter in the early 1990s.

The main source of the problem was that this strategy spread the scarce invisible resources very thinly across vast areas of smallholder agriculture which, as noted above, did not have the basic prerequisites for modern intensive farming. An important implication of the lack of an adequate infrastructure, particularly the meagre irrigation facilities, is the

¹ According to Jayne and Jones (1997, p. 1522), 'Where smallholder grain production and uptake of hybrid seed and fertiliser have expanded significantly since independence [in South and East Africa], this growth has been associated with major investments in state marketing infrastructure and credit disbursement, and state coordination of credit, input delivery, and assured outlets for crop sale'.

high degree of year-to-year variation in agricultural output and yields. As shown in Table 8, the standard deviation of the annual growth rates of average cereal yields was rapidly increasing in Africa, and was between three and four times higher than in Asia during the 1961–95 period. A similar, though more moderate, difference in the variability of yields with respect to coarse grains is evident in the table. With such a high degrees of variability of yields, indicating the high risks involved for farmers investing in new technologies in African agriculture, the low response of farmers to subsidies is not surprising. A more appropriate strategy for the development of smallholder, intensive farming under the prevailing conditions in most sub-Saharan African countries would have been to concentrate the scarce investible resources within a more limited area, in areas with the highest growth potential, and to encourage the populations of the remoter, less hospitable regions to migrate for work to such growth poles. It is only under such concentrations of population and infrastructural prerequisites that the conditions appropriate for Asian-type intensive farming could be met.¹

The difference between the more successful Asian agriculture and that of sub-Saharan Africa, therefore, was not necessarily that one was taxed more heavily than the other. In the case of Asia, agricultural taxes were combined with a more adequate provision of public infrastructural investment and productivity-enhancing technologies, so that the benefit to the farmers outweighed the effect of taxes. In the case of Africa, on the other hand, taxes were paid by a faction of the agricultural producers—those closer to and with better means of access to major domestic markets, and export cash crop producers—but the benefits, to the extent that they did not dissipate in the inefficient practices of marketing boards, were spread over vast areas and spent on subsidies to farmers with much less effectiveness than in Asia. The root cause of the problem was of course the extreme limitations of the resource base relative to the size of the required investments. It is to these issues, namely the financing of accumulation, that we shall next turn.

4. Financing accumulation and foreign aid

A large share of the required investment for the development of smallholder intensive agriculture in post-colonial sub-Saharan Africa took the form of public goods which had to be produced by the government, e.g., roads and communications, electricity, large-scale irrigation and land improvement, research and extension services etc. It may not be inappropriate, therefore, to begin with the financial constraints facing the governments in the region. The problem of financing public investments of this type has been extensively discussed in the economic development literature in relation to surplus labour economies. Given the possibility of using labour-intensive techniques with minimum requirements of foreign exchange or other scarce resources for this type of investment, it has been argued that, in surplus labour economies at early stages of their development, financial constraints should not pose any serious problems for such investments. The problem of financing investments of this type in a labour surplus economy is what the classical economists referred to as the procurement of a wage fund. As long as agricultural productivity grows at a rate sufficient to provide food for the newly employed labour in the investment sector without inflationary food price effects, there would be no financial constraints as such to the amount of investment that can be undertaken. Once the existence of surplus labour ensures the availability of labour at given real wages, the investment by the government or other non-agricultural sectors would be to a large extent self financing, in the sense that

¹ This strategy is also suggested by Ahmed and Rustagi (1984) and Hayami and Platteau (1997).

the surpluses generated in the economy as a result of the new investments, and the taxes generated thereby, would finance the original investment (see, e.g., Lewis, 1954; Kalecki, 1970; Kahn, 1972).

However, this classical model, which is highly relevant to the experience of Asian economies, breaks down in the case of labour-constrained sub-Saharan African-type economies. In the case of labour-constrained economies, major investment attempts by the government without prior procreation of the required savings through taxation would dissipate in inflationary spirals, as the movement of labour from the food-producing sector to the new investment sector would reduce the supply of food, while increasing the demand for food outside agriculture. The resulting rise in food prices and in the incomes of the smallholder food-producing sector, under the prevailing conditions in sub-Saharan African agriculture, would also be unlikely to generate the necessary finance through voluntary savings of small farmers. The extreme backwardness of rural financial markets in Africa, and the lack of opportunities for profitable investment in their own production activities, because of the lack of appropriate production technologies and the necessary infrastructure, would mean that higher incomes are likely to be by and large translated into higher consumption by farmers (see, e.g., Delgado and Ranade, 1987). This is an additional reason for the significance of taxation for capital accumulation in sub-Saharan African labour-constrained economies.

In those sub-Saharan African countries that were not large mineral exporters, the major source of government tax revenue in the immediate post-colonial period inevitably had to be the agricultural sector. The majority of agricultural producers, namely the smallholder food-producing sector, however, were not taxed and, as noted above, appear to have been the recipients of relatively large subsidies. This was only partly due to the post-colonial 'social contract' that underpinned the politics of the newly independent states, as discussed above. Direct taxes are very difficult to administer with respect to millions of small subsistence producers, especially under the conditions prevailing in African agriculture. Even indirect taxes, e.g., through the purchase prices of marketing boards, are difficult to implement under these circumstances: when official prices are below market prices, it is extremely costly to ensure delivery to the marketing boards by millions of dispersed small producers. The main burden of taxation, therefore, in economies which did not have major mineral exports, had to fall on the export cash crop producers, because they were more amenable to government border controls.

Taxation of the smallholder food-producing sector in the sub-Saharan African economies could have played a dual role in financing investment. Apart from procuring the necessary revenue for government investment, it could also have helped keep wages low in the non-agricultural sectors, by lowering the post-tax average product of labour in agriculture, or the reservation wage for workers in non-agriculture. In the absence of such taxes, therefore, the export cash crop-producing sector would be doubly squeezed; once to raise revenues to finance government investment, and once as a result of the rise in real wages resulting from the transfer of labour from the food sector to the investment sector. This latter type of effect, which amounts to a revaluation of the real exchange rate facing cash crop producers (a rise in the price of non-traded goods relative to export cash crops), also takes place when government investment is financed by revenues from mineral exports or by foreign aid. However, to the extent that these other types of financing also provide the foreign exchange for the import of cheaper foodstuff and other wage goods, they can shift part of the burden off the export cash crop sector onto the food-producing sector.

The available evidence does not allow exact estimates of the burden of taxation in the sub-Saharan African economies, which in any case would require a detailed country-by-country study. Under the prevailing conditions in most post-colonial sub-Saharan African economies, however, it is clear that the main burden of taxation had to fall on the foreign trade sector, either export cash crops or mineral exports, and in some cases on food producers with better access to markets and with high substitution possibilities for cash crop production. The rest of the economy was either too small (e.g., manufacturing sector profits) or too costly to tax (e.g., small food-producing sector in the outlying regions or informal services). To the extent that high non-agricultural wages were a reflection of the high supply price of labour under the prevailing agrarian conditions, without taxing the small food producers the taxation of non-agricultural wages also could not be very effective in raising government savings. The extent to which agriculture as a whole was taxed depended on specific country conditions, e.g., whether there existed a relatively large mineral exporting sector and the nature of the 'social contract' underpinning the politics of the newly independent state. As noted above, through the pan-territorial pricing system and direct input subsidies, at least some of the agricultural producers appear to have received considerable subsidies during the period of operations of the marketing boards. In particular, the growing net deficits of the marketing boards indicates that in most countries the outlying food-producing sectors were increasingly becoming a net burden on the rest of the economy.

Similar considerations also underpin the low saving capacity of the private sector in sub-Saharan Africa relative to that in Asia. As the experience of various Asian countries has shown, when the appropriate technological conditions for profitable investment in agriculture exist, small peasant proprietors do show a high propensity to save and invest in agriculture and related rural activities. For most smallholder producers in sub-Saharan African agriculture, however, as noted above, the appropriate conditions did not exist, and in the case of cash crop producers and more prosperous food producers with better access to markets and with adequate infrastructure, a good part of their surpluses was likely to have been taxed through the pan-territorial pricing system and export taxes. What is likely to have contributed most to the different savings performances of the private sector in the two regions over time, however, is the rapid growth of an industrial capitalist sector in Asia, and the resulting increase in the share of profits in national income, and the weakness of this development in post-colonial Africa. As pointed out by Lewis (1954, p. 157), 'the major source of savings are profits, and if we find that savings are increasing as a proportion of national income, we may take it for granted that this is because the share of profits in the national income is increasing'. This seems to have been indeed the case in relation to the Asian countries, where according to recent studies, the so-called 'investment-profitability-savings nexus' has been at the centre of a rapid increase in saving ratios (see, e.g., Akyuz and Gore, 1996; Singh, 1996). The existence of surplus labour is again critical for the Asian economies to have outperformed the African economies in this respect. Surplus agricultural labour allowed the rapid expansion of the capitalist sector that increased the share of profits in national income in Asia. In addition, as discussed in the previous section, the slow increase in real wages, relative to labour productivity growth in the modern sector in Asia, implied a growing share of profits within the sector itself. In contrast, rising real wages in the sub-Saharan African labour-constrained economies has meant both a slower growth of the capitalist sector and a lower rate of appropriation of the fruits of productivity growth by profits. To some extent, most sub-Saharan African economies seem to have tried to get round this handicap by relying on more capital-intensive

Table 9. *Savings ratio and resource gap in sub-Saharan Africa and Asia, 1965–94*

	Saving ratio ^a					Resource gap ^b				
	1965–70	1970–74	1975–79	1980–84	1990–94	1965–69	1970–74	1975–79	1980–84	1990–94
<i>Median^c</i>										
Sub-Saharan Africa	8.0	12.9	12.4	8.3	5.9	-5.7	-3.4	-5.9	-6.9	-8.6
Asia	14.5	18.8	24.8	23.2	23.9	-3.1	-1.7	-2.4	-3.9	-2.1
<i>Mean</i>										
Sub-Saharan Africa	10.0	14.2	13.0	8.2	8.8	-6.1	-2.5	-7.5	-8.4	-10.3
Asia	14.8	18.6	21.7	23.2	26.3	-2.9	-1.7	-2.1	-3.5	-2.2
<i>t-test for difference between the means</i>	-1.94	-1.75	-3.10	-5.84	-5.31	-1.81	-0.31	-3.50	-2.52	-3.50

^a Savings ratio is national savings as a ratio of GDP.

^b Resource gap is savings ratio minus gross investment ratio.

^c Regional averages are based on countries listed in Table 1. Means are simple averages.

Source: World Bank, *World Development Indicators*.

imported technology. This strategy, which would initially appear to be effective in relieving labour constraints and attaining a higher share of surplus in the modern sector, is unlikely to be sustainable in the long run, however. Given that the sub-Saharan African countries could not compete with more industrialised countries using similar capital-intensive techniques, combined with the mounting import requirements of this strategy, it would sooner or later lead to a balance of payments crisis.

It should not therefore be surprising to observe that one of the most striking comparative features of the development process in Asia and post-colonial sub-Saharan Africa has been the difference between their savings performances. This can be seen from Table 9, which shows average national savings and national resource gaps as a percentage of GDP for Asia and sub-Saharan Africa over the 1965–94 period. A national resource gap is defined as national savings minus gross domestic investment. Despite the possibly very serious measurement errors in savings ratios at individual country level, the figures shown in the table can give an overall picture of broad regional averages and trends in savings ratios which may not be far off the mark. As can be seen, during the 1965–74 period, the first post-colonial decade for which data are available, the average savings ratio for sub-Saharan Africa was less than the Asia average, but the gap between the two regions in this period was closing rapidly. From the mid-1970s, however, while the average Asian savings ratios continue their upward trend, the average saving ratios in Africa follow a declining trend. While during the 1970–74 period the average savings ratio in Africa was only about five percentage points below Asia, which was not statistically significant, by 1990–94, the gap between the two had widened to a staggering 17.5 percentage points (Table 9).

A detailed quantitative study of savings ratios in the two regions falls beyond the confines of the present study. However, a number of observations on the behaviour of average savings ratios in the two regions in the light of our previous analysis can be made. The first point is that, during the 1965–75 period, the savings effort in Africa, as indicated by savings ratio, was relatively better than in Asia, given the continent's income level, and was im-

Table 10. *Per capita GDP and share of exports in GDP in sub-Saharan Africa and Asia, 1965–94*

	Per capita GDP					Exports as % of GDP				
	1965–69	1970–74	1975–79	1980–84	1990–92	1965–69	1970–74	1975–79	1980–84	1990–94
<i>Median</i>										
Sub-Saharan Africa	58.2	67.1	76.6	69.3	66.1	23.9	23.6	23.9	23.4	23.4
Asia	100.0	109.5	127.3	137.6	149.1	10.4	19.5	21.2	22.9	26.8
<i>Mean</i>										
Sub-Saharan Africa	69.1	77.8	80.6	82.0	76.9	24.1	24.2	25.7	25.0	26.7
Asia	93.7	110.9	136.5	160.5	218.5	15.7	17.2	21.0	22.5	29.4
<i>t</i> -test for difference between the means	-2.11	-2.03	-2.54	-2.78	-2.78	1.88	1.67	0.93	0.48	-0.41

^a Per capita GDP is measured in 1985 world prices in US\$; Asian median 1965–69=100.

Regional averages are based on countries listed in Table 1. Means are simple averages.

Source: World Bank, *World Development Indicators*.

proving. For example, comparing the data on savings ratio in Table 9 with the per capita GDP figures in Table 10, it can be seen that during the 1970–74 period, the average savings ratio in Africa was 14.2%, which was equal to the average for Asia during 1965–69, while the average per capita GDP level in Africa in 1970–74 was only 80% of the 1965–69 per capita GDP level in Asia. The reason for the relatively high savings ratios during the early years of the post-colonial period in Africa was the high share of exports in GDP in these countries and the vigorous investment efforts by the governments in the region, using the proceeds from the taxation of the export sector. As shown in Table 10, during the 1965–69 period, the average export ratio for Africa was 24.1%, which was about nine percentage point above the Asia average. The proceeds from the export sector combined with foreign aid allowed relatively high investment rates in sub-Saharan Africa during the first post-colonial decade. It can be seen from Table 9 that the average investment ratio (combined savings ratio and national resource gap) during 1965–74 in sub-Saharan Africa was only two to three percentage points below the Asia average. The fact that both these sources of financing (i.e., export revenues and foreign aid) were in foreign exchange allowed the investment process to continue in the face of the labour constraints in Africa, by increasingly relying on more capital-intensive imported technologies.

In the subsequent period, however, the other structural elements discussed above came to their own and led to a rapid divergence in the trends in savings ratios in the two regions. From the early 1970s, growing instability in commodity export prices and a persistent deterioration in primary commodity terms of trade undermined the main sources of foreign exchange, savings and government revenue in most sub-Saharan African economies. It can be seen from Table 11 that the sub-Saharan African countries during the 1970–93 period were subject to severe negative terms of trade shocks. Though on average the impact of the adverse terms of trade movements on Asia and Africa does not seem to be significantly different, the much more diversified export base of the Asian countries has meant that they could cope with the resulting income losses much more easily. As shown

Table 11. *Terms of trade effect, manufacturing exports and debt ratios in sub-Saharan Africa and Asia, 1965–93*

	Terms of trade effect as % of exports ^a					Manufacturing export shares			Debt/ GNP ratio	Debt service export ratio
	1965–70	1970–75	1975–80	1980–85	1985–93	1970–75	1980–85	1990–93	1990	1990
<i>Median</i>										
Sub-Saharan Africa	3.5	-5.1	-2.1	-6.7	-13.6	7.7	7.9	19.0	89.0	20.4
Asia	-4.1	-2.4	1.0	-5.0	-9.1	43.1	48.1	72.7	49.3	23.2
<i>Mean</i>										
Sub-Saharan Africa	6.8	-5.3	-1.4	-9.4	-19.0	11.3	10.9	17.6	120.9	21.9
Asia	-3.8	0.8	-4.6	-8.4	-11.3	35.6	44.8	70.1	44.1	20.4
<i>t</i> -test for difference between the means	2.28	-1.08	0.54	-0.22	-0.87	-2.44	-4.26	-9.87	4.28	0.41

^a Terms of trade effect is measured as $X(1/p_m - 1/p_x)$, where X is the value of terminal year exports and p_m and p_x are import and export price indexes. The values shown are % of terminal year exports.

Regional averages are based on countries listed in Table 1. Means are simple averages.

Source: World Bank, World Development Indicators.

in Table 11, the average share of manufacturing exports for Asia in 1970–75 was about 36%, and by the early 1990s these countries were able to increase this share to over 70%. The flexibility with which the Asian surplus labour economies could respond to adverse terms of trade shocks by increasing the volume of their manufactured exports could not be emulated by the African labour-constrained economies under any conceivable policy regime. In this respect, it is important to note that a few countries in Africa, such as Ghana, who have managed, by dint of exchange rate devaluations and wage compression, to increase their share of manufactured exports since the mid-1980s, have suffered phenomenal terms of trade losses.¹ From the mid-1970s, therefore, with declining export revenues, partly due to the terms of trade effect, partly due to supply constraints at home, and partly due to demand constraints facing primary exporters, the growth process in most sub-Saharan African economies came to a standstill. Initially, during the second half of the 1970s, some African countries managed to increase their pace of investment by a substantial increase in foreign borrowing. The average external resource gap for Africa, which was not significantly different from that for Asia in the earlier periods, jumped to more than half of the national savings ratio in 1975–79 (Table 9). From the early 1980s, however, a declining savings ratio has meant that the pace of investment could be only maintained with a rapid build up of foreign debt. The national resource gap in sub-Saharan Africa on average has increased more than fourfold between the early 1970s and the early 1990s, while the savings ratio has declined by nearly 50%, with the investment ratio remaining on average more or less stable at around 18–19%, about 10 percentage points below the Asia average (Table 9).

¹ In Ghana, for example, the real exchange rate in 1990 was 20 times lower than the 1983 level. The terms of trade effect in Ghana during 1980–85 was -76.4% of the value of exports and, during 1985–93, it was -32.1%.

In recent years, it has become increasingly popular amongst economists to regard the low savings ratios in developing countries as a consequence of high rates of foreign aid. In view of the declining per capita incomes (particularly noticeable in the non-agricultural economy), and the structural problems which have undermined the savings capability of most sub-Saharan African economies since the late 1970s, this seems to be a misguided view, at least as far as Africa is concerned. Another popular belief, which the above analysis proves to be misguided, is that high wages in sub-Saharan African economies are the result of high rates of inflow of foreign aid. As noted above, the availability of foreign exchange which makes it possible to use capital-intensive technologies would, if anything, reduce wage pressures at any given rate of investment. The sub-Saharan African economies could not have maintained the same rates of investment, which clearly have not been very high, while using more labour-intensive technologies, as long as they were not prepared or were not able to tax the smallholder agricultural producers.

5. Concluding remarks

An important aspect of the production conditions in post-colonial sub-Saharan African countries, which distinguishes them from Asian economies, has been the relative abundance of land in relation to labour and the meagre stock of man-made capital in African agriculture. This has profoundly affected the nature and the development path of agrarian institutions and production relations, as well as the conditions of production in the non-agricultural sectors and the intersectoral relations in the two regions. The post-independence governments in both regions followed broadly similar strategies of development, centred around the construction of national economies and industrialisation. In the case of the Asian countries, the existence of an abundant supply of labour in agriculture allowed fast rates of industrial growth to take place at low and competitive wages. This also meant that, after a short period of learning and skill acquisition, the new industries in Asia could become competitive enough to export and hence benefit further from economies of scale and learning by exporting. The abundant supply of labour in the countryside in the densely populated Asian economies also contributed to the creation of an adequate infrastructure and to the ease of integration of the agricultural sector in the national market. Under these circumstances, the growth of agricultural and non-agricultural sectors assumed a complementary and mutually reinforcing character. The extent to which agriculture made a net financial contribution to other sectors varied across the countries, depending on productivity growth and the efficiency of resource use within agriculture (see Karshenas, 1995).

In the case of the sub-Saharan African economies, however, with a limited supply of labour and a relative abundance of cultivable land, the non-agricultural sectors faced relatively high and steep wage curves. This meant that, unlike Asia, most of the import substituting industries which were developed in the post-independence period could be only sustained under increasing protection. The lack of a basic infrastructure in most African countries prevented the integration of a large part of the agrarian economy into the national and international market. The low degree of market integration of African agriculture meant that the post-colonial states had to play a more direct role in creating a national economy and in intersectoral resource flows than was the case in Asia. The financial requirements for the setting up of the basic infrastructural pre-requisites of a modern economy were, however, beyond the reach of many sparsely populated agrarian economies in sub-Saharan Africa, particularly those countries without rich mineral ex-

ports. A prominent aspect of this financing problem was the lack of surplus agricultural labour, which in the case of densely populated countries in Asia had played a critical role in labour-intensive infrastructural investment in agriculture. Under these circumstances, and given the lack of capital and appropriate technologies to alleviate the agricultural labour constraint, the substitution aspect of sectoral growth rates became more prominent than the complementarities as had been the case in the surplus-labour Asian economies.

Policy lessons from the Asian experience, which do not take into account the structural differences between the agrarian economies of the two regions (sketched above), are likely to be misleading. In addition, any relevant policy lessons need to take into account specific country characteristics, particularly those pertaining to agrarian institutions, which are likely to be different in individual countries both within and between the regions. Lack of attention to such regional and country-specific factors is likely to lead to unwarranted overgeneralisations. One such overgeneralisation, common to a large part of the existing literature, is the view that low investment and growth in sub-Saharan African agriculture has been due to the disincentive effects of overtaxation of agriculture by the governments through the price or the terms of trade mechanism. As we have argued above, once the structural specificities of sub-Saharan African agriculture are taken into account, the low relative value added ratios compared with Asia do not necessarily support the overtaxation or the agricultural squeeze hypothesis. Furthermore, for the vast majority of the subsistence farmers facing prohibitively high transport costs, lack of market integration reduces the significance of the price incentive argument. In fact, the attempt by the governments to integrate such producers into the national economy through the operations of the marketing boards could be interpreted as a subsidisation of the low productivity subsistence sub-sector of agriculture by the more productive commercial sub-sector, or a redistribution within agriculture. While the price incentive effect could be said to have had an adverse effect on export cash crop producers, the main reason for the failure of this policy to stimulate agricultural output for the vast majority of subsistence producers was that limited resources were spread thinly across vast areas and spent on subsidies without noticeably altering the infrastructural and technological conditions of production for the subsistence farmers. The root cause of this phenomenon, as discussed above, was the extreme limitations of the resource base relative to the size of the required investments.

The dismantling of the marketing boards and the introduction of market liberalisation measures in most sub-Saharan African economies in recent years is likely to stimulate the growth of output in areas with better access to markets and favourable infrastructural conditions, and particularly for export cash crop producers. These policies, however, are unlikely to solve the main problem that the post-independence African governments aimed to tackle, namely, the lack of integration of the vast majority of subsistence farmers into the national economy and the adverse infrastructural and technological conditions of production in the outlying regions. Under the current conditions of transportation as well as the prevailing technological conditions of production in the subsistence sector, it would be a mistake to assume that agricultural output will be stimulated under the trickle down effect of the growth of the export cash crop sector. With greater urban populations and the slump in primary commodity prices in the international markets, most sub-Saharan African countries at present face much more stringent financial limitations than they faced in the immediate post-colonial period for the provision of an adequate infrastructure for the vast outlying agricultural lands. Under these circumstances, in order to emulate the success of Asian-type intensive peasant farming, it may be necessary to create similar rural population concentrations to those in Asia, through the possible movement of populations

towards agricultural growth poles in areas with favourable market access and suitable agro-climatic conditions. This, of course, should be done through economic incentive mechanisms rather than forced resettlement schemes. For example, the decentralisation of the fiscal system may help in generating this effect by concentrating infrastructural expenditures by local governments in high-productivity, high-income areas. However, any successful strategy needs to take into account extra-economic factors and country-specific political constraints as well. Nevertheless, this means that the role of governments in inter-sectoral resource flows is likely to remain much more prominent in sub-Saharan Africa as compared with Asia, even under a more liberalised price regime. With the current financial constraints, an agriculture-led growth strategy in most sub-Saharan African countries would also require a high degree of reliance on foreign aid. As we have argued in this paper, contrary to what seems to be a fashionable idea in the current economics literature, rather than being a substitute for domestic savings foreign aid is likely to be an important complement to savings generation and investment under the prevailing structural conditions in most sub-Saharan African economies.

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