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A New Development Strategy and Aid Policy

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Abstract:

Rapid urbanization is a fact of live even in the least developed countries (LDCs) where the lion's share of the population presently lives in rural areas and will continue to do so for decades to come. At the turn of the millennium 75% of the LDCs' population still lived in rural areas and 71% of the LDCs' labor force was involved in agriculture. But even though the largest share of their population lives in rural areas and directly or indirectly derives their livelihoods from agriculture, a rapidly increasing share of the population migrates to urban centers in search for employment opportunities outside agriculture in industrial enterprises or the services sector The main purpose of this paper is to examine the causes and consequences -- in particular, the policy implications -- of the ongoing urbanization in the African LDCs. It is found that the employment opportunities in either rural or the urban sector are not growing adequately. This paper attempts to analyze the emerging trends and patterns of urbanization in the African LDCs within a dynamic dual-dual framework with a strong emphasis on rural-urban migration and the informal sectors. The analysis pinpoints, among other things, the need to build up productive capacities in order to create adequate employment and incomes for the rapidly growing population--- particularly in the urban areas. The development of productive capacities, which is a precondition for the creation of productive employment opportunities, is a central element of viable poverty reduction strategy for Bangladesh as well. Without significant poverty reduction it is impossible to think of viable urbanization on the basis of sustainable development criteria in this group of very African countries.   The donors, especially the OECD/ DAC countries, should provide the necessary financial backing for such a sustainable and equitable development strategy for Africa. It is necessary to reverse the trends in aid, and to provide a much larger share of aid for productive sector development, including the development of rural and urban areas, and the development of agricultural and non-agricultural sectors in line with the perspective of the dual-dual model. Although urban centers mostly host non-agricultural industries, sustainable urbanization also strongly depends on what happens in the agricultural sectors. Productive employment opportunities in rural areas are important in order to combat an unsustainable migration from rural areas to urban centers, and productive employment opportunities in urban centers are essential to absorb the rapidly increasing labor force in the non-agricultural sector.

Keywords: Urbanization, Africa, LDCs, Dual-Dual Model, Informal Sector, Poverty, Employment, Capabilities.

A. Introduction

Rapid urbanization is a fact of live even in the least developed countries (LDCs)[2] where the lion's share of the population presently lives in rural areas and will continue to do so for decades to come. At the turn of the millennium 75% of the LDCs' population was still living in rural areas and 71% of the LDCs' labor force was involved in agriculture.[3] But even though the largest share of their population continues to live in rural areas and directly or indirectly derive their livelihoods from agriculture, a rapidly increasing share of the population migrates to urban centers in search for employment opportunities outside agriculture in industrial enterprises or the services sector. Herrmann (2006) has pointed out that this decade 2000—2010 is a historical population and employment transition for the LDCs. For the first time in their history, the LDCs' urban population grows faster than their rural population, but also the LDCs' labor force in non-agriculture grows faster than their labor force in agriculture. These trends are driven by large LDCs in Asia, but they are also apparent in the LDCs in Africa. The LDCs which do not yet witness this transition are projected to do so in the decade 2010—2020.

The main purpose of this paper is to examine the causes and consequences -- in particular, the policy implications -- of this ongoing urbanization for the LDCs. After briefly presenting the basic theoretical framework (section B), our paper will discuss the driving forces behind rapid urbanization in the LDCs (section C), effects of rapid urbanization on employment and poverty in the LDCs (section D), and implications for policies in LDCs (section E).

B. The Theoretical Framework:
A Dual-Dual Approach with Endogenous Migration

As our basic theoretical framework we use what can be called a "dual-dual" model (Svejnar and Thorbecke 1980, 1982; Khan 1982 a, b, 1985, 1994, 1997, 2004 a, b, 2006; Khan and Thorbecke 1988, 1989; Thorbecke, 1992, 1994; Thorbecke and

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[2] The group of LDCs currently includes 50 countries, 35 of which in Sub-Saharan Africa, 14 in Asia, and Haiti. The United Nations identifies these countries as least developed owing to a combination of three criteria, namely low per capita income, weak human resources and economic vulnerability.
[3] The labor force is the economically active population.

Santiago 1984; Thorbecke and Morrisson 1989). This corresponds to the characteristics of a developing economy with not only the traditional and modern sectors but also a kind of dualism within each of these sectors in terms of a formal/ informal dichotomy. More specifically, the process of development for economies moving from the least developed status to a higher level of development may modify the traditional sector further in the direction of a more market-based modern sector while the formal/ informal dichotomy is accentuated within both the sectors. This is our most important move theoretically which is consistent with the stylized facts to be explained in our paper. Consequently, our approach reveals that even within the category of the least developed economies the theoretical possibility of the uneven development of the formal and informal sectors both in the urban and the rural areas can indeed be empirically confirmed as well.

Thus, in our theoretical framework, the coexistence and distribution of modern and informal type of activities in both rural and urban areas are taken as basic structural features of the economy in question. Our approach integrates poverty analysis with rural-urban movements in an economy wide setting by endogenizing both migration[4] and intra-group income distributions and the nominal poverty line. Following this line of work leads to our being able to assess policy repercussions on both poverty specific to particular socioeconomic groups and on overall national poverty.

The starting point is the dual economy models of Lewis (1954) and Fei and Ranis (1964)[5]. These pioneering efforts, however, could not or did not take into account the co-presence of dualism within each sector of the two sector models of the dual economy. Erik Thorbecke first raised this issue in 1979 during the course of a National Science Foundation interdisciplinary project on technology and development and Svejnar and Thorbecke (1980, 1982) was the first published work on a prototype of dual-dual technology classification scheme. Khan (1982 a, b) and Khan (1985) were applications of this scheme to the energy and textiles sectors in South Korea. Khan (1983) raised the issue of linking technological dualism to poverty theoretically, following an early observation of Pyatt and Thorbecke (1976). Khan and Thorbecke (1988, 1989) were further applications of technological dualism to Indonesia. Khan

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[4] Within an overall trend towards rapid urbanization there can be migration in both directions. This can have important implications for poverty reduction policies, as Khan (2006) shows for South Asia.
[5] See Khan (1997) chapters 2 and 3 for a historical survey and a specific intertemporal dualistic model which is used to analyze the conflict between employment and output.

(1999) explores the connections between rural-urban dualism and migration and poverty in South Africa. Khan (2006) explores both rural-urban and reverse migration in a dual-dual model for South Asia.

In the current formulation, a rural/ urban dichotomy is combined with traditional/ modern technological dualism, leading to a fourfold classificatory scheme.[6] A further extension of the early dual-economy models is that the rural economic sector does not only include agricultural activities, but also non-agricultural activities including various off-farm industries and services:

1. *Rural traditional* is closely associated with informal activities, traditional labor-intensive technologies, family farms, food production for domestic consumption, and small-scale off-farm enterprises;
2. *Rural modern* is associated with formal activities, capital-intensive technology, large-scale farming, cash and export crops, and large-scale off-farm enterprises;
3. *Urban traditional* is associated with informal activities, including petit services such as shoe-shining and the provision of other ad-hoc services on a non-contractual basis;
4. *Urban modern* is associated with formal activities, with formal industrial enterprises, including textile factories with export-orientation, and modern services, such as banking, insurance, consultancy and telecommunications.

Poverty analysis in this dual-dual approach can be integrated with migration and various shocks that are important features of the urbanization process in Africa. The empirical sections described below illustrate this. For a formalization of the dual-dual model, the reader is referred to the appendix.[7]

C. Driving forces of rapid urbanization

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[6] See Svejnar-Thorbecke (1980, 1982) and Khan (1983) for early developments. See also Khan (1997, 2006) and Stifel-Thorbecke (2003).
[7] As is clear from the structure of the model, an empirical application utilizing the model fully and rigorously requires the use of a Social Accounting Matrix (SAM) and relevant econometric estimates of elasticities etc. in order to calibrate the Computable General Equilibrium (CGE) model. This is part of our future work on the subject.

Today, Sub-Saharan Africa has the highest rate of urbanization, albeit based on relative low levels of urbanization, compared with other continents (UN-HABITAT 2007). Over the past decades the share of the urban population in the total population, as well as the share of the non-agricultural labor force in the total labor has persistently increased in the African LDCs, and that there is a close relationship between these two (chart 1). Table 1 shows that between 2000 and 2010 the urban population in the LDCs is projected to grow faster for the first time than the rural population. The former is projected to grow by 61 million (from 107 to 168), whereas the latter is expected to grow by 56 million (from 294 too 350). And the growth of the non-agricultural labor force is expected to exceed the growth of the agricultural labor force in 2010—2020 for the group of African LDCs. But although the group of African LDCs will experience this employment transition only in the decade to come, a number of African LDCs are already undergoing the employment transition (Herrmann 2006). These countries include Benin, Chad, the Central African Republic, the Democratic Republic of the Congo, Equatorial Guinea, Lesotho, Liberia, Mauritania, Sierra Leone, Sudan, Togo and Zambia, as well as the small island states of Cape Verde, Maldives and Sao Tome and Principe.

The growth of the urban population and labor force, relative to the rural population and labor force, has two potential reasons, namely differences in birth and mortality rates between rural and urban areas and/ or an increase of migration from rural to urban areas. This paper focuses on rural-urban migration and in this context it discusses both push and pull factors.

1. Push factors

The classical dual-economy models (e.g., Lewis 1954; Fei and Ranis 1964) explain rural-urban migration by increasing productivity in the agricultural sector which leads to a decreasing demand for agricultural workers and subsequently enables agricultural workers to migrate to non-agricultural sectors. But like a strong agricultural development, a weak agricultural development can also act as a push factor for rural-urban migration. If the agricultural sector fails to provide sufficient employment for a growing number of workers, and/ or if the agricultural sector fails

to provide sufficiently high household incomes to cope with a growing number of dependants, people can be encouraged to seek employment outside agriculture.

Data of the Food and Agricultural Organization (FAO) of the United Nations is showing that many African LDCs have land that could potentially be brought under cultivation (Herrmann 2007). But the notion of land abundance in countries of Africa must be qualified. It is one thing for countries to have an abundance of potentially arable land, but the quality of this land is another. According to FAO estimates there were a large number of African LDCs where the population was already living on and of fragile land, which is defined as land in arid regions, with steep slopes and fragile soils (UNCTAD 2006). Out of a sample of 31 African LDCs, for which data were available, there were 16 countries in which more than 30% of the population was living on fragile lands, and there were 8 countries in which more than 50% of the population was living on fragile lands in the mid-1990s. This situation has not significantly changed since, as indicated by (i) small and decreasing farm size per capita, (ii) low and often decreasing productivity of agricultural workers, and (iii) low and often decreasing yields per hectare.

Table 2 shows that between 1980—1983 and 2000—2003 agricultural land per agricultural worker has remained constant or declined in 24 of the 33 African LDCs for which data is available. Over the same period, labor productivity of agricultural workers has decreased in no less than 7 of 22 African LDCs with available data.[8] At the end of this period, African LDCs had an average farm size of about 1 hectare per agriculturalist. Furthermore, in comparison to more advanced developing countries the LDCs have seen a relatively small increase or even a decrease of yields per hectare for many agricultural goods. Between 1980--1983 and 2000--2003 the LDCs recorded increasing yields per hectare only for tobacco, but decreasing yields for fiber and oil-bearing crops, as well as fruits and nuts, and sugar (UNCTAD 2006).

Household surveys, which provide a more disaggregated picture, are showing considerable differences in the distribution of land between income groups (e.g., Jane et al. 2003), as well as differences in output per hectare between income groups (e.g., Ellis and Freeman 2004). The studies are painting a consistent picture in the sense that

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[8] The estimates of labor productivity in African LDCs are heavily constrained by the lack and quality of available data. For a detailed discussion of data and methodological issues, see Herrmann (2006) and UNCTAD (2006).

lower income groups have smaller plots of land and lower yields than higher income groups.[9] Data for 2001 and 2002 are showing that in Malawi, Tanzania and Uganda the lower income quartiles had persistently lower average output than the next higher income quartile (Ellis and Freeman 2004).

The low level of agricultural land and labor productivity in Africa is closely associated with the unfinished business of the Green Revolution on the continent. African LDCs continue to have very low levels of irrigation and fertilizer consumption, in comparison not only with more advanced developing countries but also with Asian LDCs. Between the 1960s and the period 2000—2003 the share of agricultural land under irrigation has remained constant at 7% in African LDCs but has increased from 10% to 30% in Asian LDCs, and the consumption of fertilizer relative to total agricultural land has increased from only 2% to 7% in African LDCs but has increased from 2% to 44% in Asian LDCs.[10] African LDCs have also been importing and using fewer agricultural machines, including tractors, than Asian LDCs. Although the share of agriculture value added in total value added of the African LDCs has barely decreased since the early 1980s (from 34% to 33% of total value added), the share of agricultural machinery imports in total capital goods imports of African LDCs has almost decreased by half since the 1980s (from 3.7% to 1.2% of capital goods imports) (UNCTAD 2006 and 2007). The declining imports of agricultural machinery have not been compensated by an increasing domestic production of agricultural machinery. Finally, following structural adjustment programmes which encouraged austere fiscal policies, many African countries have reduced their spending on agricultural research and development (Pardey and Beintema 2001), even though public investment in agricultural was found to have relatively high social returns and poverty-reduction effects (Fan et al. 2004 and 2005).

The analyzed data is showing that while some African LDCs have scope to increase agricultural production by cultivating more land, many African LDCs are already reaching the frontier of arable land. The inability to significantly expand agricultural production means that an increasing share of the agricultural labor force in African LDCs will not be able to find productive employment in agriculture. At the

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[9] Jayne et al. (2003) are highlighting that in Ethiopia the lowest income quartile had access to only 0.03 hectares/ capita, whereas the highest income quartile had access to 0.58 hectares, according to 1995 data. The respective numbers for Mozambique are 0.10 and 1.16 (1996 data), Malawi 0.08 and 0.60 (2000 data), Rwanda 0.02 and the 0.43 (2000 data), and Zambia 0.12 and 1.36 (2000 data).
[10] Estimates based on FAO, FAOSTAT online.

same time, the failure to significantly intensify agricultural production means that an increasing share of the rural populations in African LDCs can no longer live of agriculture. Because of the weak development of their agricultural sector, LDCs have a decreasing capacity to absorb the agricultural labor force in agricultural production. Chart 2 shows that in the LDCs a large additional increase of the agricultural labor has been associated with a marginal increase of agricultural labor productivity. By contrast, in developed countries a decrease of the agricultural labor force has been associated with an increase of agricultural labor productivity. Other developing countries fall between these extremes – they have seen a smaller increase of the agricultural labor force than the LDCs, but they also have had a smaller increase of agricultural labor productivity than the developed countries.[11]

The relationship between changes in the agricultural labor force and the changes in agricultural labor productivity can work in both directions. While it is plausible that an increase of agricultural labor productivity allows for a decrease of the agricultural labor force, it is equally plausible that an increase of the agricultural labor force results in a decrease of agricultural labor productivity, particularly if the increase of the labor force is not matched by a concomitant increase of land, machinery, finance, seeds or fertilizers. Whereas the former line auf causality may reflect the situation in more advanced countries, the latter may have been important in the least developed countries, where the size of agricultural land per agriculturalist is small and declining, and the use of agricultural machinery continues to be very small as well. Indeed, the almost unlimited supply of cheap agricultural laborers itself may have discouraged increasing investment in agricultural machinery. The substitution of labor for capital however faces limits, especially if agricultural land is limited and agricultural inputs are not accessible or affordable.

Unlike early formulations of dual economy models, which focused on a positive agricultural development as a precondition for rural-urban migration, this analysis of least developed countries suggests that negative agricultural development can be an equally powerful push-factor for rural-urban migration. This finding

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[11] The high and rapidly increasing labor productivity in agriculture of developed countries sheds doubt on the assumption that developing countries have a comparative advantage in agriculture. The increasing productivity gap in agriculture between the developed countries and the developing countries is attributable to the changing nature of agricultural production, namely a shift from labor-intensive to capital-intensive and low-technology to high-technology. The changing nature of agriculture merits an in-depth analysis, as it has far-reaching implications for development trajectories and strategies.

however requires further qualifications. Whether people migrate from rural to urban areas depends not per se on whether the agricultural sector in specific is characterized by a good or bad development, but depends on whether the rural sector in general generates sufficient and sufficiently lucrative employment opportunities. While in practice rural economic activities are often synonymous with agricultural activities, for analytical purposes it is important to recognize that rural economic activities also include non-agricultural activities. Furthermore, agricultural- and non-agricultural activities in rural areas can reinforce each other. Just like a weak development of the agricultural sector can reinforce and can be reinforced by a weak development of rural industries, a strong development of the agricultural sector can be furthered by a strong development of off-farm enterprises, which provide inputs and services for agricultural producers or engaged in the processing of agricultural produce. Accordingly, a loss of employment due to growing productivity in agricultural may actually be offset by the creation of new employment opportunities in expanding off-farm enterprises. The possibility of such favorable structural changes in rural areas is largely disregarded by simpler versions of the dual-economy model. As result, these models fail to recognize that strong development in the agricultural sector may in fact be a weaker push factor for rural-urban migration than a weak development in the agricultural sectors.

In conclusion, a model with explanatory power beyond a specific context needs to realize that it is employment in the rural areas that ultimately determines migration to urban centers, and that the employment in rural areas depends as much on the development of the farm sectors as it depends on the development of the off-farm sector. Furthermore, failure of the different rural sectors to generate sufficient and sufficiently lucrative employment can be due to a positive development, which is associated with increasing agricultural productivity, or a negative development, which is associated with limited agricultural production. Although it is important to realize the complex interactions between push factors for rural-urban migration, it remains a relatively straight forward exercise to identify the principle push factors in the least developed countries. Given that the rural economic activities in the African LDCs are largely determined by agricultural activities, it is essentially the weak agricultural development in the African LDCs that encourages rural-urban migration. The weak development in the farm sector is complemented by a weak development in off-farm industries, and low levels of labor absorption.

2. Pull factors.

Although the push factors are important for an understanding of rural-urban migration equally important are the pull factors. In line with earlier structuralist models we argue that rural-urban migration is motivated by wage differentials. But it is important to specify that the wage differentials between rural and urban areas can be perceived as well as real, and that the higher wage levels in urban areas are often unattainable in practice. Following Herrmann (2006) we estimate differences in potential earnings between the agricultural sector/ rural areas and the non-agricultural sector/ urban areas by differences in labor productivity.

Chart 3 shows an increasing divergence of labor productivity between different groups of countries since the early 1980s. In 2000—2003 it required, on average, 5 workers in an LDCs to produce what 1 worked produced in a more advanced developing country, and no less than 94 workers in an LDCs to produce what 1 worker produced in a developed country. These differences in labor productivity and the associated differences in potential earnings help to explain the increase of international migration from poor countries to more advanced countries. Similarly, the differences in agricultural and non-agricultural labor productivity within the LDCs help to explain the increase of migration from rural to urban areas in the LDCs themselves.

The chart shows that the LDC group has recorded a decrease of non-agricultural labor productivity and an increase of agricultural labor productivity over the period 1983—2003. Yet, despite the decrease of non-agricultural labor productivity, the level of non-agricultural labor productivity remains relatively high (see table 2). Herrmann (2006) estimates that non-agricultural labor productivity of the LDC group is about four times as high as agricultural labor productivity, and that non-agricultural labor productivity of African LDCs is almost seven-times as high as their agricultural labor productivity in the period 2000—2003. The differences between the two groups of LDCs are largely influenced by differences in agricultural labor productivity. During the period, the average annual agricultural labor productivity in African LDCs was USD 243, compared with USD 572 in Asian

LDCs, whereas the average non-agricultural labor productivity in African LDCs was USD 1643, compared with USD 2507 in Asian LDCs.[12]

The difference in earning potential between agriculture and non-agricultural sectors is the principle pull factor for an increasing migration from rural to urban areas. But many people who migrate to urban areas will not be able to find a well paying job in the non-agricultural sector (Khan 1983, 1985, 2004, 2006; Stifel and Thorbecke 2003). Because of the shortage of formal-sector jobs – be it in industry or services – the majority of urban populations will be more likely to end up working as shoes shiners at a street corner rather than a regular employee of a textile enterprise, for example.

D. Rapid urbanization, employment crisis and poverty

Today many African LDCs have lower labor productivity than in the early 1980s. Agricultural labor productivity has declined in about 1/3 of the African LDCs and non-agricultural labor productivity has fallen in more than 4/5 of African LDCs for which data was available (see table 2). The decrease of labor productivity indicates the degree of underemployment. In the poorest countries which provide virtually no unemployment benefits, unemployment is not a viable option. Therefore many of the formally unemployed will seek informal employment. Informal employment is characterized by unstable jobs, low productivity and minimal wages, which is symptomatic for underemployment.

The finding that labor productivity in non-agricultural sector has decreased, which is another way of saying that underemployment in the non-agricultural sector has increased, is confirmed by case study evidence. Kingdon, Sandefur and Teal (2005) are showing that that in Tanzania the labor fore in non-agricultural has grown from 2.26 million but wage employment outside agriculture has grown by only 172 thousand between 1990/1991 and 2000/2001. This finding is being confirmed by a recent labor market survey of selected African capitals – Cotonou (Benin), Ouagadougou (Burkina Faso), Bamako (Mali) and Dakar (Senegal) – which has

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[12] These estimates are based on an average of 28 African LDCs (excluding Angola and Equatorial Guinea which are the two main oil exporters in this group) and an average of 10 Asian LDCs (excluding Yemen which is the larges oil exporter in the region).

illustrated that on average 15% of the urban population has been unemployed and 68% of the urban population has been unemployed or underemployed (Brilleau, Roubaud and Torelli 2005). The inability to find employment in the formal sector encourages people to assume employment in the informal sector. Brilleau, Roubaud and Torelli (2005) are showing that about 77% of the labor force in the before mentioned capitals has been employed in informal private enterprises. Furthermore, Charmes (2002) has estimated that about 93% of new employment opportunities in Sub-Saharan Africa have been in the informal sector.

Table 3, which is drawing on case studies of selected African LDC, is underlining the importance of the informal sector. In the countries under consideration, the informal sector is employing between 58% and 93% of the non-agricultural labor force and is contributing to between 20% and 59% of the non-agricultural GDP. While the informal sector fulfills an important function by providing employment to people who would face unemployment otherwise, the informal sector should not be mystified as a viable social safety net. The imputed labor productivity gaps in the table 3 are showing that the productivity of the non-agricultural informal sector have been only about 7.5% of the labor productivity in the non-agricultural formal sector. The potential wages that can be paid in the informal enterprises of the non-agricultural sector are correspondingly smaller than the potential wages that can be paid in the formal enterprises of the sector.[13] Although these are estimates, the data is clearly showing that a considerable productivity difference and a wage difference between formal and informal activities in urban areas. This difference provides a possible incentive for reverse migration from urban to rural areas. In other words, people who migrate from rural of urban areas, but are unable to find a formal sector job in non-agriculture, may have an incentive to migrate back to the rural areas an assume a job in the agricultural sector. Employment in the informal sector however is not only associated with lower productivity and wages, it is often also associated with less stable employment and more hazardous employment conditions.[14]

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[13] Following Brilleau, Roubaud and Torelli (2005), the differences in pay between informal and formal enterprises in urban centers are smaller. They find that in the period 2000--2001 in Cotonou, Ouagadougou, Bamako and Dakar the average annual pay was about CFA 31 in informal private enterprises, compared with CFA 86 in formal private enterprises, CFA 124 in public enterprises, and CFA 106 in public administration. In accordance, the pay in informal enterprises was about 29% of the average pay in formal enterprises.

[14] For a more positive view on the informal sector as a safety net, see for example Hope (1999).

In sum, LDCs are affected by rapid urbanization, and rapid urbanization in the LDCs is leading to massive un- and underemployment, which is associated with low household incomes and widespread poverty. While extreme poverty – measured by $1 per person and day adjusted for purchasing power parities (PPP) – remains higher in rural areas than in urban areas, the declining labor productivity in the non-agricultural sector suggests that poverty is increasing in the urban areas as well. Ravallion, Chen and Sangraula (2007) have estimated that the urban poor in Sub-Saharan Africa have increased from 24% to 30% of the total poor in the region between 1993 and 2002. But the relative increase of the urban poor has not been associated with a decrease of the rural poor. As a result, by 2002 Sub-Saharan Africa did not only have more poor in the urban areas but also had more poor in the rural areas, compared with 1993. This development stands in marked contrast to other regions.[15] Thus some of the predictions of our dual-dual model are empirically confirmed.

E. Policy implications of rapid urbanization

Dijk (2006) has described urbanization – the agglomeration of households in confined space – in terms of a U-shaped curve. Initially rapid urbanization is associated with considerable challenges and costs, but if managed successfully these costs can be turned into opportunities and benefits. However, as our theoretical discussion of the dual-dual model of urbanization and the persistence of informal sectors and the empirical evidence we provide in this paper demonstrate, this turn-around – which is associated with economies of scale and an increase of economic and ecological efficiency, among others – is not an automatic process (UN-HABITAT 2007). It requires a sound public management of urban agglomerations and, all else equal, this depends on a vibrant economy in and around urban centers. A growing urban economy must ensure sufficient revenues for urban authorities, and it must create sufficient jobs for the urban population. Otherwise, urban centers will be confronted by a spread of poverty and slums, social exclusion and crime (UN-HABITAT 2007), and the urban authorities will lack revenues to finance necessary

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[15] While the increase of poverty in Africa that is indicated by household-survey based poverty estimates, which are available for only few LDCs, is consistent with national-accounts based poverty estimates, which can be constructed for most of the LDCs. But although the trends in poverty are similar, the levels of poverty diverge. For a discussion of the differences between the two types of poverty estimates for low-income countries, see UNCTAD (2002), Karshenas (2001) and Deaton (2001).

interventions and investment, including investment in housing, water, sanitation, electricity, waste management, transport, schools and health care facilities, as well as spending on welfare programmes, and law and order.

The data examined in this paper is showing that urban centers in African LDCs are witnessing a large influx of people, but that the cities in most African LDCs are suffering from a lack of jobs. Urban centers continue to be characterized by a rapid increase of un- and underemployment, and associated with this a rapid increase of poverty and slums. To use the picture of the u-shaped curve of urban development, many cities are at the downward slope and the challenge is to encourage a transition to the upward slope. Although this transition requires a better management of urban centers, it goes well beyond a narrow focus on the urban centers alone. It is important that the anti-urban bias, which has characterized development efforts in recent years, is not replaced by an anti-rural bias in the years to come.[16] Indeed, we are arguing that successful urban development is closely linked to and cannot be separated from successful rural development. In accordance, we are encouraging development policies to focus on the strengthening of three linkages between informal and formal enterprises in the urban areas, linkages between small-scale farms and large commercial farms in the rural areas, and finally linkages between farms and firms across geographic locations. The strengthening of these linkages is a complex challenge that cannot be adequately addressed in this paper. It is possible however to outline the necessary directions and changes of current development policies.

The principal objective of development policies, as well as related efforts to sustainably reduce poverty, should be to increase the absorption of the labor force by creating more and more productive employment opportunities, which generate sufficiently high household incomes (UNCTAD 2006; Hope 1999). The creation of employment opportunities in rural areas is necessary to decrease migration to urban centers, whereas the creation of employment opportunities in urban centers is important to address the downsides of rapid urbanization.

The creation of more and more productive employment opportunities requires the development of productive capacities across sectors and industries. According to UNCTAD (2006) the development of productive capacities requires a strengthening

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[16] Lipton (1977) argued that development policies should focus on the rural rather than the urban areas, as the rural areas constitute the backbone of developing economies and home to the majority of the poor. In recent years, development and poverty reduction efforts have therefore underlined the importance of rural and especially agricultural development.

of production linkages (between enterprises and sectors), a strengthening of productive resources (factors of production), and a strengthening of entrepreneurial capabilities (managerial, technical and technological skills). Entrepreneurial capabilities can be thought of as the necessary capabilities to effectively use the factors of production in order to convert raw inputs into competitive outputs (see also Gore and Herrmann 2008a).

Furthermore, the development of productive investment requires public and private investment in physical and social infrastructure, as well as a strengthening of institutions. While developing countries and their development partners are placing increasing focus on strengthening public institutions – as reflected, for example, by a considerable increase of aid for governance-related purposes – it is equally necessary to think of possibilities to strengthen private-sector support institutions. These include private financial intermediaries, agencies for investment and trade promotion, chambers of industry and commerce, and producer associations, but they also include public development banks, marketing boards and caisse de stabilisation (see e.g. UNCTAD 2008). The latter have been weakened or closed during structural adjustment programmes. While it is important to recognize that many of these institutions suffered from corruption and inefficiencies, it is equally important to recognize that these institutions held important functions in developing economies. The institutional void that resulted from the dismantling of such institutions was not, contrary to the expectations of the reformers, filled by private sector initiatives. It is therefore necessary to rebuild such institutions, while taking account of past experiences. Enterprises in the least developed countries in particular require public or public-private institutions that are supporting innovations and providing help with respects to new technologies and diversification, storage and shipment, finance and insurance, as well as market intelligence and marketing.

Despite the need for productive sector development, productive sector development does not receive adequate attention. In recent years, official development assistance (ODA) committed to LDCs was characterized by two important shifts. The first is a shift in overall aid from development-oriented aid to emergency assistance; the second is a shift in development-oriented aid from economic infrastructure and production to social infrastructure and governance-related matters (UNCTAD 2006, 2007, 2008). These trends can negatively affect the economic development of LDCs and lead to even more "fire-fighting" in the LDCs in

the future. Between 1998--2000 and 2003—2005 aid commitments for social infrastructure and governance increased from 8.8% to 11.3% of total aid commitments – mostly due to an increase of aid for government and civil society – whereas aid commitments for economic infrastructure and production decreased from 3% to 2.4% of total aid commitments (UNCTAD 2007). Although aid for the social sector and governance-related matters can be used to enhance capabilities and hence future productivity, it requires careful planning and development of institutions. What is crucial is to provide adequate development-oriented aid to properly motivated recipient policy makers (Khan 2002, 2003, 2004c; Gang and Khan 1999).

The agricultural sector is particularly hard hit by the decline of aid in the productive sector more generally. Between 1998--2000 and 2003--2005 aid for agricultural research, extension and education has decreased from about 0.7% to 0.1% of total aid commitments. The aid committed to agriculture is little in absolute terms, but it is even smaller, if compared against the fact that agricultural sector continues to account for about 1/3 of the LDCs' GDP, and that the rural areas continue to host about 3/4 of the LDCs' population in 2000--2003. Furthermore, the decline of aid for agricultural development in LDCs rests uneasy with the finding that agricultural investment in LDCs – particularly investment in agricultural research and development, and investment in rural infrastructure, including feeder roads – is characterized by relatively high social rates of return (Fan et al. 2004 and 2005). The decline of aid for agricultural development is paralleled by a slight increase of aid for industrial research and development, from USD 1.3 million in 1998—2000 to USD 6.7 million in 2003-2005, in real terms. But measured as a share of total aid commitments, the aid commitments for industrial research and development remained low, accounting for less than 0.0% of the total in the latter period (UNCTAD 2007).[17]

Like foreign aid for agriculture, domestic investment in agriculture also declined in many LDCs between the 1980s and 1990s. Over this period, public investment in agricultural research and development is declining in 8 of 13 African LDCs for which data were available, while private investment in agricultural research

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[17] UNCTAD (2007), as well as Gore and Herrmann (2008b) show that contrary to what the common believe may be, investment in science, technology and innovation is important even in LDC-type economies. These economies however do not require foundation research that pushes the global technology and knowledge frontier, they require rather applied research and development which helps in very concrete ways to improve production processes and products.

and development has remained small.[18] Beintema and Stads (2006) have estimated that private investment in agricultural research and development accounted for only 2% of the total investment in agricultural research and development in Sub-Saharan Africa in 2000.

In sum, the development of productive capacities, which is a precondition for the creation of productive employment opportunities, is a central element of viable poverty reduction strategies, as well as viable urbanization. African LDCs should develop a corresponding focus in their development strategies, and their donors, especially the OECD/ DAC countries, should provide the necessary financial backing for these strategies. It is necessary to reverse the trends in aid, and to provide a much larger share of aid for productive sector development, including the development of rural and urban areas, and the development of agricultural and non-agricultural sectors. Although urban centers mostly host non-agricultural industries, sustainable urbanization also strongly depends on what happens in the agricultural sectors. Productive employment opportunities in rural areas are important in order to combat an unsustainable migration from rural to urban areas, and productive employment opportunities in urban centers are essential to absorb the rapidly increasing labor force in the non-agricultural sector.

Only if urban populations find productive employment will they benefit from rising household incomes. Only then will they be able to move out of slums, afford better access to water and sanitation, better access to health care and schools and live in a safe environment free from crime in the urban centers. In Sen's terminology, the capabilities enhancement for the urban poor in LDCs are intimately connected with both the means and the ends of development in our suggested strategy.

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[18] Estimates based on ASTI CIGAR online.

Appendix:
Formal Representation of Dual-Dual Model

For the interested reader, the formal representation of the dual-dual model with Constant Elasticity of Substitution (CES) Production Functions is given below. The readers interested in following the equations in detail are referred to section 4 "Notation and symbol explanation" below, which describes the model in greater depth.

Production and Labor Market

$$X_{fc} = A_{fc} \left[\beta_K^{fc} \overline{K}_{fc}^{\frac{\mu_{fc}-1}{\mu_{fc}}} + \beta_{LS}^{fc} LS_{fc}^{\frac{\mu_{fc}-1}{\mu_{fc}}} \beta_{LU}^{fc} LU_{fc}^{\frac{\mu_{fc}-1}{\mu_{fc}}} \right]^{\frac{\mu_{fc}}{\mu_{fc}-1}} \quad ....(1)-(2)$$

$$X_{ic} = A_{ic} \left[\beta_K^{ic} \overline{K}_{ic}^{\frac{\mu_{ic}-1}{\mu_{ic}}} + \beta_{LU}^{ic} LU_{ic}^{\frac{\mu_{ic}-1}{\mu_{ic}}} \right]^{\frac{\mu_{ic}}{\mu_{ic}-1}} \quad ....(3)-(4)$$

$$i_{ic} = \frac{P_{ic} X_{ic}}{LU_{ic}} ....(5)-(6)$$

$$wu_{ex} = \frac{P_{ex} \beta_{LU}^{ex} X_{ex}}{LU_{ex}} ....(7)$$

$$wu_{ex} = i_{food}(1+\delta)...........(8)$$

$$i_{srvc} = \frac{P_{im} \beta_{LU}^{im} X_{im}}{LU_{im}} ....(9)$$

$$w_{im} = i_{srvc} + \gamma \frac{\Pi}{LU_{im}} ....(10)$$

$$\Pi = P_{im} X_{im} - i_{srvc} LU_{im} - ws_{im} LS_{im} ....(11)$$

$$wu_{ex} = (1 - \frac{hLU_{im}}{LU_{srvc} + LU_{im}}) wu_{srvc} + (\frac{hLU_{im}}{LU_{srvc} + LU_{im}}) wu_{im} ....(12)$$

$$ws_{fc} = \frac{P_{fc}\beta_{LS}^{fc}X_{fc}}{LS_{fc}} \dots\dots\dots\dots(13)-(14)$$

$$ws_{im} = \left[\frac{1-\beta_{LU}^{im}}{(1-\theta)\beta_{LU}^{im}+\theta(1-\beta_{LU}^{im})}\right]^{1/1-\theta} ws_{ex} \dots\dots\dots\dots(15)$$

Disposable income and savings

$$I_{rih} = i_{food}LU_{food} \dots\dots\dots\dots(16)$$

$$I_{ruh} = wu_{ex}LU_{ex} \dots\dots\dots\dots(17)$$

$$I_{rsh} = ws_{ex}LS_{ex} \dots\dots\dots\dots(18)$$

$$I_{rlh} = P_{ex}X_{ex} - ws_{ex}LS_{ex} - wu_{ex}LU_{ex} - S_{ex} \dots\dots\dots\dots(19)$$

$$I_{uih} = i_{srvc}LU_{srvc} \dots\dots\dots\dots(20)$$

$$I_{uuh} = ws_{im}LU_{im} \dots\dots\dots\dots(21)$$

$$I_{ush} = ws_{im}LS_{im} \dots\dots\dots\dots(22)$$

$$I_{ukh} = P_{im}X_{im} - ws_{im}LS_{im} - wu_{im}LU_{im} - S_{im} \dots\dots\dots\dots(23)$$

$$I_{bch} = tM \dots\dots\dots\dots(24)$$

$$S_{fc} = \lambda_{fc}[P_{fc}X_{fc} - ws_{fc}LS_{fc} - wu_{fc}LU_{fc}] \dots\dots\dots\dots(25)-(26)$$

Demand

$$C_c^h = \frac{\alpha_c^h I_h}{P_c} \dots\dots\dots\dots(27)-(49)$$

Foreign Trade

$$M = \sum_h C_{im}^h + \frac{S_{im}}{P_{im}} - X_{im} \dots\dots\dots\dots(50)$$

$$EX = X_{ex} - \frac{S_{ex}}{P_{ex}} \dots\dots\dots\dots(51)$$

Equilibrium Conditions

$$\sum_c LU_c = LU \ldots\ldots\ldots\ldots(52)$$

$$\sum_{fc} LS_{fc} = LS \ldots\ldots\ldots\ldots(53)$$

$$X_{ic} = \sum_h C_{ic}^h \ldots\ldots\ldots\ldots(54)-(55)$$

$$P_{im} \equiv 1+t \ldots\ldots\ldots\ldots(56)$$

$$P_{ex} \equiv 1 \ldots\ldots\ldots\ldots(57)$$

The production sectors are specified as CES with the choice of nonunitary[19] elasticities of substitution for the two formal sector commodities in equations 1 and 2. The informal sector commodities also have CES specifications. All commodities are produced under capital constraints. Thus, capital, K, in each sector has an upper bound denoted by a bar above K. The assumption that capital stock is fixed in each sector may be relaxed, but it is in fact, a fairly standard assumption for developing economies.

In the informal sectors each worker receives her average revenue product. Rural small holders may work on common land and these rural farming households may share the total income equally among all the family members. Urban informal workers supply all their labor at the prevailing wage rate. Thus leisure is not an argument in their objective function. This may be defended as an extreme assumption when people are at the margins of subsistence. Equations 5 and 6 show the informal sectors' income determination.

The total income per unit includes logically the returns also to non-labor assets for those who own land or capital. Hence, the relevant measure of income is total income per unit from all sources.

The profit maximizing rural large landholders ensure that under competitive conditions wages for unskilled workers in the export sector are equal to the marginal revenue product of the unskilled labor they have to hire. Equation 7 reflects this condition. Equation 8 shows the equilibrium allocation of unskilled labor in the rural

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[19] The Stifel-Thorbecke paper uses Cobb-Douglas production functions with elasticities of substitution restricted to a value of 1.

informal sector. In equilibrium, the rural sector wage rate is below the wage rate in the formal sector by a fixed factor. This reflects the assumption that there are transactions costs in working in the rural formal sector that is captured by this mark up.[20]

Turning now to the import sector, for unskilled workers in the urban area the assumption here is that they get the income per unit of labor in the urban services sector (shown in equation 9) plus a share of the profits as given in equation 10. The profit determination itself is shown in equation 11.

The Harris-Todaro model features regarding rural-urban migration are captured in equation 12. Here, in equilibrium, rural wage must equal the expected wage in the urban sector. In equation 12, the probability of getting a job in the import sector is given by the share of the urban uneducated labor force in that particular sector multiplied by a scale parameter, *h*.

Skilled workers are employed only in the formal sectors. Their wages are determined in equations 13 and 14 by their marginal revenue products. We now turn to the determination of incomes for the households.

1. Household Income Determination

There are nine types of households. Two in the rural area are landowning households -- large and small. There are also urban capitalists and bureaucrats. The other five are households where the main source of income is from labor.

The rural informal households which are really rural small holders receive their total revenue from production as shown in equation 16. Rural unskilled and skilled households receive their wage incomes as shown in equations 17 and 18 respectively. Equation 19 gives the incomes of the rural large land holders.

Equations 20- 24 show the incomes of the urban households. The working class households receive wage income and the capitalists the profit incomes, in general. The bureaucratic households capture part of the rents from imports by

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[20] Alternatively, one could also postulate that there is an 'insider' market wage equilibrium in the formal sector, and those unskilled workers lucky enough (or more likely, because they know someone already working in the formal sector) to get a job in the formal sector can enjoy this wage premium. This is not a hypothesis the authors consider, but the data will be consistent with this hypothesis as well.

colluding with the rent seekers.[21] The formal sector employers (rural large land owners and urban capitalists) are the only savers in the model. They each save a constant fraction of their nominal incomes.

Household demand functions are captured by maximization of Cobb-Douglas utility functions subject to their income constraints. There are 23 such equations (equations 27-49) because the four rural household groups have access to only food and importables. This gives us eight equations. Each of the urban groups has access to three commodities--- food, importables and urban services. This gives another 15 equations. The prices for the three commodities can be used to define an overall deflator.

2. Foreign Trade

Imports in this model are the difference between domestic demand and production of import competing sector. Exports can be supplied at the prevailing price up to any quantity under the small country assumption. Thus exports are equal to total output less the savings in the form of exportables of the rural large landholders. Equations 50 and 51 show the import and export demand functions respectively.

3. Equilibrium conditions for the model as a whole and Causal Depth

There are two sets of equilibrium conditions in the model. First, the labor market equilibrium conditions are given by equations 52 and 53. There is disguised unemployment, as discussed before, but no formal involuntary unemployment. The second set of equilibrium conditions given by equations 50 and 51 is that the domestic demand for the informal sector goods and services is matched by domestic supply. Prices in the formal sectors are set by the world market prices. The export price is normalized to one. The import price is equal to 1+t, where t is the tariff rate. Exchange rate is held fixed during the particular modelling period. It is clear that the current account balance must be exogenous. This balance is equal to foreign savings

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[21] Salaries are excluded in equation 24. The reasoning is that these are invariant to exogenous shocks.

which are assumed to be zero here. Hence current account balance is assumed to be zero.[22] This completes the description of the formal model. It is clear that this model has greater causal depth than the standard neoclassical optimizing model since the households and firms can optimize here but within a deeper socio-economic structure. In addition to the standard *explananda* common to the concerns of the two rival models, these structural features allow the social scientist to explain other phenomena such as poverty, migration and their interactions among other things.

4. Notation and symbol explanation

Production and Labor Market

$$X_{fc} = A_{fc} \left[\beta_K^{fc} \overline{K}_{fc}^{\frac{\mu_{fc}-1}{\mu_{fc}}} + \beta_{LS}^{fc} LS_{fc}^{\frac{\mu_{fc}-1}{\mu_{fc}}} \beta_{LU}^{fc} LU_{fc}^{\frac{\mu_{fc}-1}{\mu_{fc}}} \right]^{\frac{\mu_{fc}}{\mu_{fc}-1}} \quad ....(1)-(2)$$

Eqn 1-2: output of formal sector [superscript/subscript; fc=formal sector commodities]

X=output in formal sector; A=Technology coefficient; K=Fixed capital; β=share of input in output; LS= skilled labor; LU=unskilled labor; μ=elasticity of substitution;

$$X_{ic} = A_{ic} \left[\beta_K^{ic} \overline{K}_{ic}^{\frac{\mu_{ic}-1}{\mu_{ic}}} + \beta_{LU}^{ic} LU_{ic}^{\frac{\mu_{ic}-1}{\mu_{ic}}} \right]^{\frac{\mu_{ic}}{\mu_{ic}-1}} \quad ....(3)-(4)$$

Eqn 3-4: output in informal sector [superscript/subscript; ic=informal sector commodities]

X=output in formal sector; A=Technology coefficient; K=Fixed capital; β=share of input in output; LS= skilled labor; LU=unskilled labor; μ=elasticity of substitution;

$$i_{ic} = \frac{P_{ic} X_{ic}}{LU_{ic}} \quad ....(5)-(6)$$

i_{ic}=income in informal sector (wage in informal sector is determined)

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[22] Implicitly, this amounts to claiming for a reforming economy(see section 5 above) that the stabilization policies indeed succeed in restoring the external balance.

$$wu_{ex} = \frac{P_{ex}\beta_{LU}^{ex}X_{ex}}{LU_{ex}}\ldots\ldots\ldots(7)$$

wu_{ex}= unskilled labor wage in export sector [subscript ex is used for export sector representation]; β=share of input in output

$$wu_{ex} = i_{food}(1+\delta)\ldots\ldots\ldots(8)$$

δ= Transaction costs of work in rural formal sector (export) instead of working in food sector (for unskilled labor) ; i_{food}=income in food sector

$$i_{srvc} = \frac{P_{im}\beta_{LU}^{im}X_{im}}{LU_{im}}\ldots\ldots\ldots(9)$$

i_{srvc}=income in service sector of unskilled workers

$$w_{im} = i_{srvc} + \gamma\frac{\Pi}{LU_{im}}\ldots\ldots\ldots(10)$$

w_{im}= wages in import competing industry; γ=profit share ratio for unskilled labor in import competing sector; Π=profits;

$$\Pi = P_{im}X_{im} - i_{srvc}LU_{im} - ws_{im}LS_{im}\ldots\ldots\ldots(11)$$

Π=profits of capitalists; ws_{im}=skilled labor wage;

$$wu_{ex} = (1 - \frac{hLU_{im}}{LU_{srvc} + LU_{im}})wu_{srvc} + (\frac{hLU_{im}}{LU_{srvc} + LU_{im}})wu_{im}\ldots\ldots\ldots(12)$$

h= scale parameter

$$ws_{fc} = \frac{P_{fc}\beta_{LS}^{fc}X_{fc}}{LS_{fc}}\ldots\ldots\ldots(13)-(14)$$

ws_{fc}= skilled wage in formal sector

$$ws_{im} = \left[\frac{1-\beta_{LU}^{im}}{(1-\theta)\beta_{LU}^{im} + \theta(1-\beta_{LU}^{im})}\right]^{1/1-\theta} ws_{ex}\ldots\ldots\ldots(15)$$

ws_{im}= skilled wage in import competing sector; θ= relative risk aversion of skilled workers

Disposable income and savings

$$I_{rih} = i_{food} LU_{food} \ldots\ldots\ldots\ldots(16)$$

I_{rih}= disposable income of rural informal household

$$I_{ruh} = wu_{ex} LU_{ex} \ldots\ldots\ldots\ldots(17)$$

I_{ruh}= disposable income of rural unskilled household

$$I_{rsh} = ws_{ex} LS_{ex} \ldots\ldots\ldots\ldots(18)$$

I_{rsh}= disposable income of rural skilled household

$$I_{rlh} = P_{ex} X_{ex} - ws_{ex} LS_{ex} - wu_{ex} LU_{ex} - S_{ex} \ldots\ldots\ldots\ldots(19)$$

I_{rlh}= disposable income of rural large landholders household

$$I_{uih} = i_{srvc} LU_{srvc} \ldots\ldots\ldots\ldots(20)$$

I_{uih}= disposable income of urban informal household

$$I_{uuh} = ws_{im} LU_{im} \ldots\ldots\ldots\ldots(21)$$

I_{uuh}= disposable income of rural unskilled household

$$I_{ush} = ws_{im} LS_{im} \ldots\ldots\ldots\ldots(22)$$

I_{ush}= disposable income of urban unskilled household

$$I_{ukh} = P_{im} X_{im} - ws_{im} LS_{im} - wu_{im} LU_{im} - S_{im} \ldots\ldots\ldots\ldots(23)$$

I_{ukh}= disposable income of urban capitalist household

$$I_{bch} = tM \ldots\ldots\ldots\ldots(24)$$

I_{bch}= disposable income of bureaucrat household

$$S_{fc} = \lambda_{fc} [P_{fc} X_{fc} - ws_{fc} LS_{fc} - wu_{fc} LU_{fc}] \ldots\ldots\ldots\ldots(25) - (26)$$

S=savings of formal sector employers (urban capitalists and rural large landholders)

Demand

$$C_c^h = \frac{\alpha_c^h I_h}{P_c}................(27)-(49)$$

α=budget share of commodities; I=household income; C=consumption of commodities by households; P=price of commidites;

Foreign Trade

$$M = \sum\nolimits_h C_{im}^h + \frac{S_{im}}{P_{im}} - X_{im}................(50)$$

M=import; C= demand for imported commodities; S=savings of capitalists; P=price of imported commodities; X=output in import competing sector;

$$EX = X_{ex} - \frac{S_{ex}}{P_{ex}}................(51)$$

EX=export; X=output in export sector; S=savings of rural capitalists (large landholders); P=price of export commodities;

Equilibrium Conditions

$$\sum\nolimits_c LU_c = LU ....(52)$$

$$\sum\nolimits_{fc} LS_{fc} = LS................(53)$$

$$X_{ic} = \sum\nolimits_h C_{ic}^h ....(54)-(55)$$

$$P_{im} \equiv 1 + t................(56)$$

P=price of imports; t= tariff rate

$$P_{ex} \equiv 1................(57)$$

P=price of exports

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Chart 1: Changing location of population and labor force in African LDCs, 1950-2010
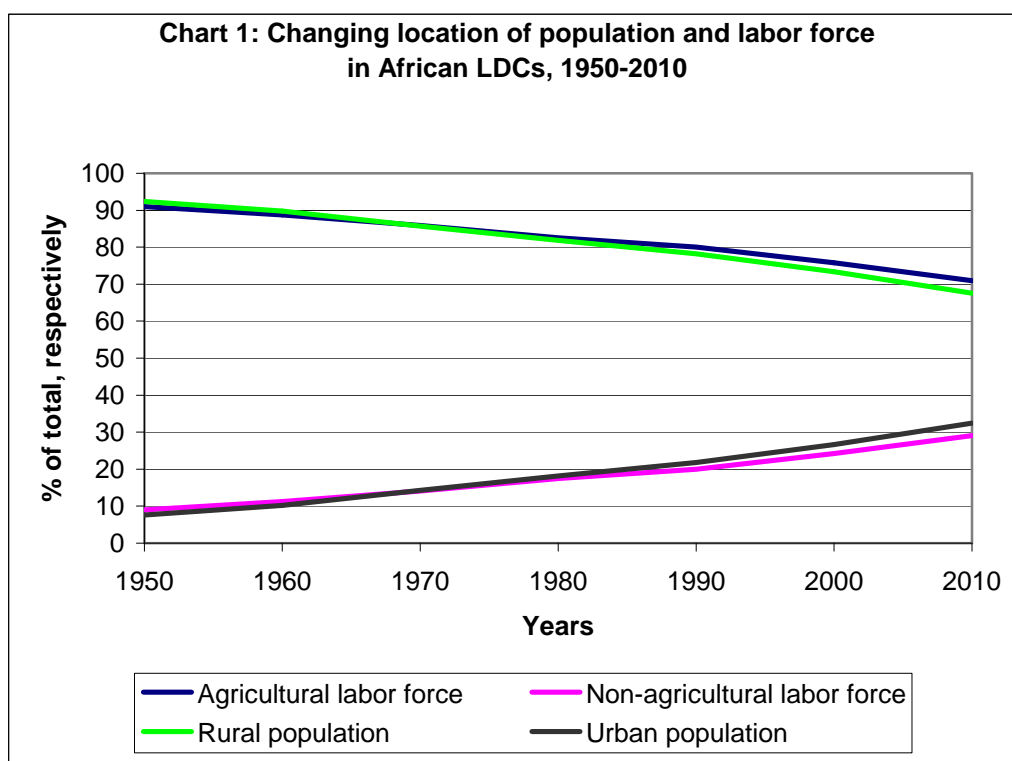
Source: Estimates base on FAO, FAOSTAT, online.

Table 1: Changing size and locus of population and labor force in African LDCs, 1950-2010
(Million)

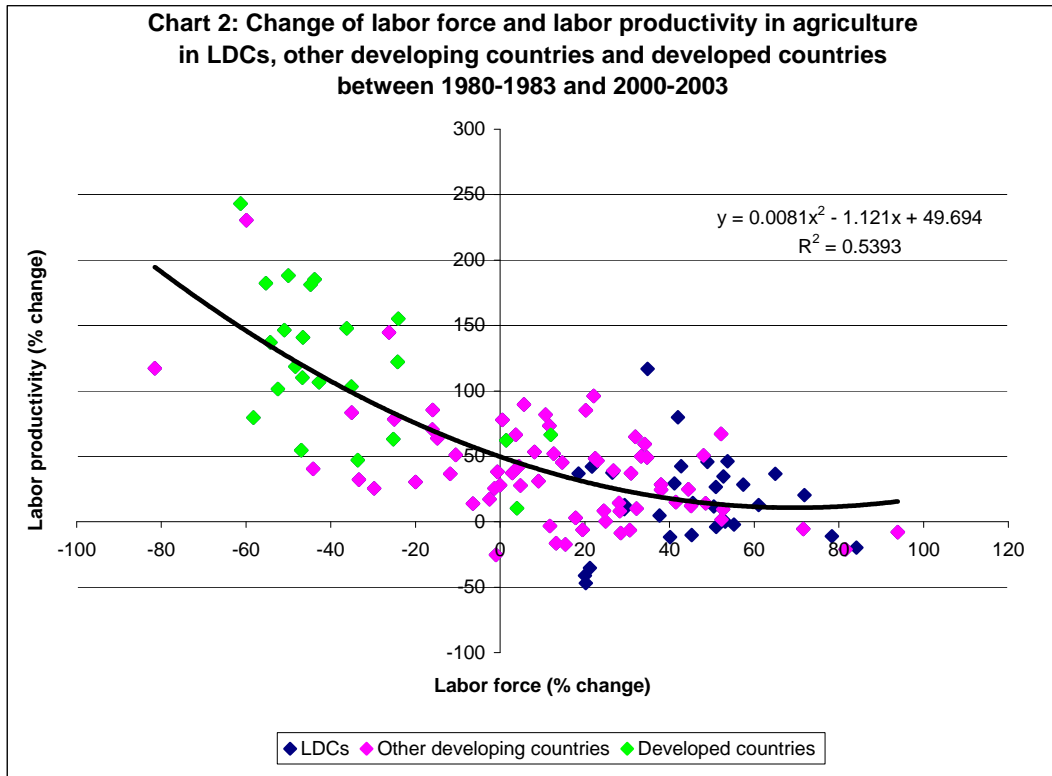|	1950	1960	1970	1980	1990	2000	2010	Change 1990-2000	2000-2010
Total population	109	136	175	231	308	401	518	94	117
Rural areas	101	122	150	189	240	294	350	54	56
Urban areas	8	14	25	42	67	107	168	40	61
Total labor force	57	69	86	109	142	183	238	42	55
Agriculture	52	61	74	90	113	139	169	26	30
Non-agriculture	5	8	12	19	28	44	69	16	25

Source: Estimates based on FAO, FAOSTAT, online.

Table 2: Agriculture in African LDCs, 1980-1983 and 2000-2003

	Agriculture value added (% total value added)			Agricultural labor force (% total labor force)			Agricultural land/ labor ratio (hectare/ agricultural worker)			Agricultural labor productivity (agricultural value added/ agricultural labor force)			Memo: Non-agricultural labor productivity (non-agricultural value addes/ non-agricultural labor force)		
	1980-1983	2000-2003	% change	1980-1983	2000-2003	% change	1980-1983	2000-2003	% change	1980-1983	2000-2003	% change	1980-1983	2000-2003	% change
Angola	10.2	6.3	-37.6	76.1	71.5	-6.1	1.2	0.8	-34.8	..	148	..	..	..	..
Benin	25.2	36.2	43.5	66.7	52.5	-21.3	1.4	1.8	26.7	264	572	116.9	..	..	..
Burkina Faso	32.3	31.7	-2.1	92.2	92.2	0.0	0.8	0.8	1.5	128	165	28.5	2871	3919	36.5
Burundi	52.4	49.5	-5.6	92.7	90.1	-2.8	0.6	0.4	-23.5	118	104	-11.8	1316	958	-27.2
Cape Verde	16.4	11.5	-29.6	35.7	22.1	-38.1	1.2	1.2	4.2	..	1630	..	..	..	..
Central African Republic	43.4	58.7	35.2	84.0	71.4	-15.1	1.9	1.6	-14.9	281	400	42.3	1933	691	-64.3
Chad	40.0	37.8	-5.4	87.2	73.8	-15.4	1.6	1.3	-19.7	151	214	42.5	1532	1000	-34.7
Comoros	26.6	45.7	72.2	80.2	73.0	-9.0	0.6	0.5	-19.5	305	367	20.4	..	1025	..
Congo DR	29.0	61.9	113.8	71.1	62.5	-12.1	0.8	0.6	-29.8	221	198	-10.3	1256	195	-84.5
Djibouti	..	3.7	..	84.2	78.0	-7.4	0.0	0.0	-45.3	..	69	..	..	6298	..
Equatorial Guinea	55.0	6.3	-88.6	78.0	69.7	-10.5	2.7	1.7	-38.5	..	712	..	..	24086	..
Eritrea	..	15.0	..	..	77.1	..	..	0.4	..	..	63	..	..	1211	..
Ethiopia	59.5	46.9	-21.1	..	81.7	..	..	0.5	..	..	123	..	..	622	..
Gambia	39.3	32.3	-17.6	84.1	78.5	-6.6	0.6	0.6	-6.3	290	233	-19.7	2349	1784	-24.1
Guinea	23.0	23.9	3.8	90.3	83.3	-7.8	0.5	0.5	-4.0	..	221	..	..	3499	..
Guinea-Bissau	47.9	57.2	19.5	87.2	82.4	-5.4	1.0	1.1	13.3	185	249	34.6	..	873	..
Lesotho	27.4	17.4	-36.4	41.5	38.9	-6.3	1.4	1.2	-12.3	452	509	12.8	875	1533	75.3
Liberia	..	..	..	76.0	66.9	-12.0	1.0	0.7	-22.3	..	..	..	..	..	..
Madagascar	27.3	30.0	9.7	81.0	73.6	-9.2	0.8	0.6	-26.2	181	177	-2.2	2043	1156	-43.4
Malawi	29.7	37.1	24.9	87.2	82.3	-5.5	0.6	0.5	-13.1	89	122	36.7	1435	965	-32.7
Maldives	..	..	..	47.6	21.1	-55.6	0.2	0.4	95.1	..	..	..	..	..	..
Mali	44.3	41.4	-6.6	88.5	80.1	-9.4	0.6	1.0	62.0	172	223	29.3	1664	1274	-23.5
Mauritania	24.0	20.5	-14.5	69.0	52.5	-23.9	0.4	0.8	72.9	207	283	36.8	1465	1219	-16.8
Mozambique	31.7	27.0	-14.8	84.2	80.9	-3.9	0.6	0.6	0.5	..	133	..	..	1542	..
Niger	31.7	39.3	24.1	91.1	87.4	-4.0	3.9	3.2	-18.4	189	168	-11.0	3863	1727	-55.3
Rwanda	35.2	42.7	21.3	92.6	90.6	-2.2	0.4	0.3	-19.1	220	220	0.0	4250	2439	-42.6
Sao Tome and Principe	..	20.0	..	74.0	62.7	-15.3	1.2	1.2	3.8	..	223	..	..	1639	..
Senegal	23.4	18.1	-22.7	80.2	73.3	-8.6	1.1	0.8	-30.1	275	264	-4.1	3122	2885	-7.6
Sierra Leone	54.1	46.9	-13.4	69.4	61.4	-11.5	0.6	0.6	-3.6	532	282	-46.9	910	507	-44.3
Somalia	..	..	..	77.9	70.5	-9.5	0.4	0.4	-11.5	..	..	..	..	..	..
Sudan	36.0	41.1	14.2	71.8	59.7	-16.8	2.3	2.2	-5.5	378	680	79.7	1633	1434	-12.2
Tanzania UR	..	44.5	..	85.6	79.8	-6.7	1.0	0.8	-23.8	..	278	..	..	1371	..
Togo	22.9	34.9	52.6	68.3	58.8	-13.9	0.5	0.3	-26.2	275	402	46.2	1583	937	-40.8
Uganda	51.5	36.1	-29.9	86.7	79.4	-8.4	2.6	2.2	-15.9	202	228	12.8	1307	1547	18.3
Zambia	14.9	20.5	37.5	75.7	68.4	-9.6	2.5	1.7	-31.8	185	207	11.7	3362	1743	-48.2

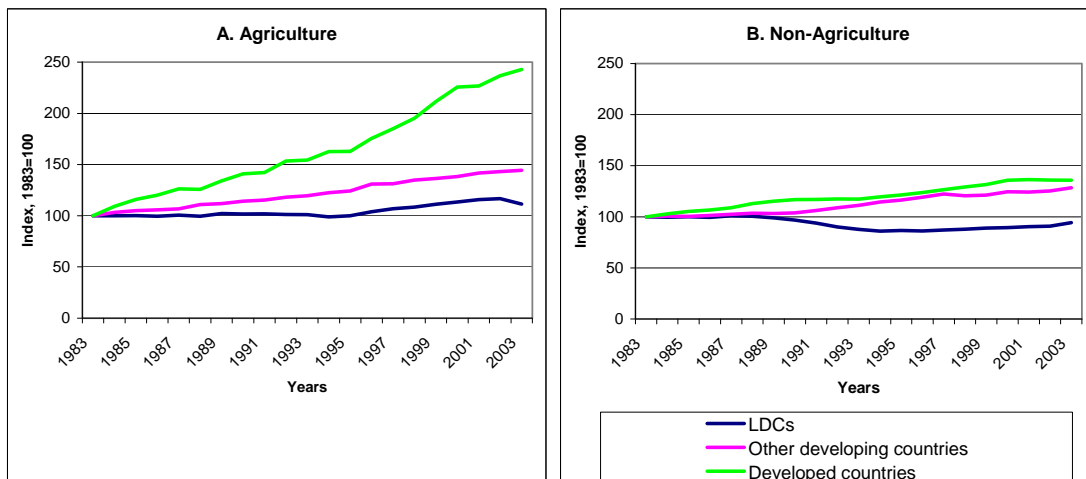Source: Estimates based on World Bank, World Development Indicators, CD-ROM; and FAO, FAOSTAT online.

Note: (a) Value added data are in constant 2000 dollars. (b) Labor force is the economically active population. (c) Other LDCs include Afghanistan, Bangladesh, Bhutan, Cambodia, Kiribati, Lao PDR, Myanmar, Nepal, Samoa, Soloman Islands, Timor-Leste, Tuvalu, vanuatu and Yemen in Asia. as well as Haiti in the Americas.

Chart 2: Change of labor force and labor productivity in agriculture in LDCs, other developing countries and developed countries between 1980-1983 and 2000-2003

$$y = 0.0081x^2 - 1.121x + 49.694$$
$$R^2 = 0.5393$$

Labor productivity (% change)

Labor force (% change)

◆ LDCs ◆ Other developing countries ◆ Developed countries

Source: Herrmann (2006).

Chart 3: Change of labor productivity in agriculture and non-agriculture in LDCs, other developing countries and developed countries between 1983-2003

A. Agriculture

Index, 1983=100

Years

B. Non-Agriculture

Index, 1983=100

Years

LDCs
Other developing countries
Developed countries

Source: Estimates based on World Bank, World Development Indicators, CD-Rom; and FAO, FAOSTAT online.

Table 3: Contribution of informal sector to non-agricultural employment and GDP in selected LDCs (%)

	Year of estimate	Share of informal employment in total non-agricultural employment	Contribution of informal sector to non-agricultural GDP	Memo: Imputed labor productivity gap[a]
Benin	1993	93	43	17.0
Burkina Faso	1992	77	..	6.0
Chad	1993	74	45	3.6
Guinea	1994-2000	72	..	..
Mali	1989	79	42	5.1
Mauritania	1989	75	14	18.6
Mozambique	1994	74	45	3.5
Niger	1995	..	59	..
Tanzania	1991	..	43	..
Senegal	1991	76	41	4.5
Zambia	1998	58	20	1.9

Source: UNCTAD 2006: 184.

a The imputed labor productivity gap is estimated by dividing the formal sector GDP per formal sector worker by the informal sector GDP per informal sector worker.