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Dualistic Development Models and Urban Unemployment in LDCs: Theory and Evidence from Tropical Africa*

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Dualistic development policy has resulted in increased urban unemployment, decreased agricultural production, and economic stagnation in Tropical African countries. At the theoretical level, this perverse result is due to the fact that dualistic development models: (i) are based on unrealistic assumptions; (ii) are inconsistent with the principles of efficient resource allocation; and (iii) fail to recognize the nature of power relationships between the industrial and agricultural sectors. Failure of dualistic development models to achieve the desired results is, in part, due to the mechanism for their implementation in Tropical African countries.

I. Introduction

The employment creation objective of economic development seems to have been an elusive one for most Less Developed Countries (LDCs), especially those in Tropical Africa. High unemployment rates as well as underemployment in the urban industrial sectors is a pervasive problem in Tropical Africa while there appears to be labor shortages in the rural agricultural sector, especially during the growing and harvesting seasons. High rates of unemployment and underemployment in the urban sectors are not limited to African nations with stagnant economies; the relatively prosperous economies have not escaped the ravages of high rates of urban unemployment. The problem seems to grow with time.

A natural question that comes to mind is whether development theory

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has failed Africa as far as employment creation is concerned or African policy makers have not implemented development policies that create more employment. Are African development policies consistent with development theory? One of the earliest models of economic development introduced by Lewis (1954), Jorgenson (1961) and Fei and Ranis (1964) is the dualistic model of economic development. In this model, the economy is visualized as consisting of two separate economies — one modern, urban, highly productive, uses modern technology and inputs, is dynamic and growing, even though small; the other, traditional, rural, stagnant with low productivity, uses very little modern inputs and technology, and often very large — existing simultaneously in the same country at the same time. The objective of economic policy in such a model is to transfer resources from the large, traditional, low productivity sector to the small, modern, high productivity sector, thus increasing overall productivity in the economy.[1]

The general assumption in such models is that resources transferred from the traditional to the modern sector are easily and instantaneously absorbed and fully employed by the modern sector. This implies that there are no unemployed resources in either the modern industrial sector or the traditional agricultural sector.[2] Yet all evidence point to the existence of large numbers of unemployed and underemployed labor in the urban sectors of most LDCs. Does that mean that the assumptions of dualistic models are flawed or that the models are internally inconsistent?

There have been a lot of theoretical work extending Harris and Todaro's seminal work (Harris and Todaro, 1970; Todaro, 1969) explaining the simultaneous existence of urban unemployment and rural to urban migration in LDCs. Though these works establish stability conditions as well as analyze the dynamics of rural urban labor transfer, they have not questioned the efficiency of such labor transfers in achieving the objectives of economic development, especially the creation of productive employment. However, recent theoretical work by Batra and Lahiri (Batra and Lahiri, 1987) indicates that a more efficient way of generating employment, output, faster economic growth rate, and equitable income distribution in LDCs is to *transfer capital to the agricultural sector* rather than to transfer labor to the industrial sector. In light of this result, it may be necessary to critically examine the Lewis/Fei-Ranis models of economic development at least within the African context.

[1] See Fei and Ranis (1964), Jorgensen (1961) and Lewis (1954), Paauw and Fei (1973).

[2] In this paper, the terms modern, urban, and industrial sectors are used interchangeably. In the same way, agricultural, rural and traditional sectors are used to imply the same concepts.

This paper focuses on the employment creation aspects of dualistic development. Specifically, it analyzes the employment creation capacity of the urban modern sector to absorb labor transferred from the agricultural sector. At issue here is the relationship between the quantity of labor released from the agricultural sector and the quantity of jobs created in the industrial sector to absorb labor from the agricultural sector. Dualisitic models have assumed that there is a perfect match between the rate of labor release from the agricultural sector and the rate of labor absorption in the industrial sector. What is the basis for this assumption? What are the implications for economic growth if this assumption does not hold? These questions are explored in this paper using the experience of dualistic models of development as implemented in Tropical African countries as a case study.[3] The experience of African countries is very useful for a discussion of dualistic development models because all countries in Tropical Africa have been following dualistic development paths in one form or another since attaining independence in the early 1960s.

Critical examination of employment creation in dualisitic models is very important because unemployment implies a loss of potential output to the struggling economies of African countries. Second, almost all Tropical African countries have implemented and continue to implement dualistic development models. It is therefore necessary to evaluate the performance of this policy in one critical area — employment creation. Third, in light of the poor employment record, it is necessary to critically examine both theory and policy implementation. This is necessary because different reasons for failure will require different solutions. For example if the source of failure is found to be inappropriate theory, then a new theory has to be developed and a whole new approach to the employment problem developed. On the other hand, if the theory is sound but failure is due to inefficient policy implementation, then countries have to look for ways to improve the efficiency of program implementation rather than look for alternative models of economic development.

The paper is organized as follows: Section II discusses the various forms of dualism and the interaction between the urban industrial sector and the traditional agricultural sector with particular reference to labor release by the agricultural sector and labor absorption in the industrial sector. This section is followed by a discussion of labor absorption by the in-

[3] Because of the colonial heritage, most African countries had dualistic economies at the time of independence so the natural development strategy that came to them are dualistic strategies. Second, some of the dualistic theorists became policy advisors to some African governments (eg. Lewis was an economic advisor to the government of Ghana in the late 1950s).

dustrial sector in African countries in section III. It also discusses the development implications of failure to match job creation in the urban sector with labor release from the agricultural sector. Section IV concludes the paper.

II. Aspects of Dualistic Development

Dualism implies that two distinct and separate economies coexist in the same country at the same time. One sector, usually, the rural agricultural sector is characterized by low productivity, low utilization of capital inputs, is technologically stagnant, and governed by tradition, while the other sector — usually the industrial sector — is characterized by the use of modern inputs, high productivity, technological dynamism, and organized along commercial lines. Since economic development entails increased output and modernization of production technique, among other things, an easy and logical way to attain development in a dualistic economy, it appears, is to transfer resources from the low productivity rural sector to the higher productivity modern urban sector (Lewis, 1954; Fei and Ranis, 1964; Jorgenson, 1961).

Several variants of dualistic models, depending upon the assumptions one make about productive conditions in the low productivity sector and whether the economy engages in international trade or not, exist. Lewis (1954) and Fei and Ranis (1958), in their analysis of dualism assume that the marginal product of labor in agriculture is zero while it is positive and high in the modern industrial sector. Jorgenson's variant of dualism assumes that the marginal product of labor in agriculture is positive but low, compared to that of labor in the industrial sector so there is a net gain in output when labor is transferred from the agricultural to the modern sector.

Lewis', Fei and Ranis', and Jorgenson's model of dualistic development assume that the economy does not trade with the outside world, hence they are characterized as closed dualism. Paauw and Fei (1973) on the other hand assumes that the economy is open, and explicitly models the foreign sector into their version of dualistic development. Not only should one have to consider the interaction between the modern and traditional sectors, one also has to consider the interaction between the domestic economy and the international economy when analyzing development in dualistic economies. It appears that open dualistic models are more appropriate for the highly open African economies.

Regardless of the type of dualism one considers, the process of

economic development that emerges is the same — transfer of resources from the traditional sector to the modern sector. This resource transfer could be achieved through market forces (eg. labor shortages in the modern sector leading to higher wages in that sector and therefore attracting labor from the agricultural sector), or, as it is quite often the case, through direct involvement of government in resource allocation (eg. government setting modern sector real wage above the real wage in agriculture to induce labor transfer and subsidies to industry). With increased employment and hence output in the modern sector, profits of entrepreneurs in that sector are supposed to increase. These profits are then supposed to be plowed back into increased investment in the modern sector to employ more labor and the process rejuvenates itself through a dynamic growth process. Though investment for continued growth in the modern sector is supposed to come from profits generated in that sector, the initial investment to employ the transferred labor comes from the agricultural surplus transferred by dualistic landlords (Fei and Ranis, 1964; Lewis, 1954).

Dualistic development theory advocates the transfer of resources from the low productivity sector to the high productivity modern sector without analyzing the *cause* of productivity differential between the two sectors. It accepts the productivity differential as immutable and does not make any attempt to formulate policies to *increase* productivity in either sector. The agricultural sector's role is a passive one of labor release while the industrial sector is seen as the active sector. In this regard, dualistic development models depart from the tradition of classical economics that looks for ways to increase efficiency in *all sectors* and hence the economy. Could rapid economic development not be achieved by increasing productivity and modernization of the large traditional sector instead of transferring resources to the industrial sector? On this point, dualistic models seem to be contrary to the prerequisite for sustained economic growth and development — increased production and productivity in the agricultural sector.

Certain assumptions, both implicit and explicit, in dualisitic development models need to be analyzed for their validity and hence their effects on any rational development policy. We have referred to the assumption of low or zero marginal productivity of labor in agriculture and the implication that its transfer as well as that of other resources from the agricultural sector does not involve any opportunity cost. Certainly, this assumption does not hold anywhere. Empirical works done in Southeast Asia in the 1950s indicate that the marginal product of labor in agriculture is positive and significant.[4] In African countries, labor shortages during the sowing and harvesting seasons negatively affect

agricultural output, indicating that the marginal product of labor in the traditional agricultural sector is positive. Indeed, the "Green Revolution" in Southeast Asia has proved that contrary to the assumption of labor surplus in the agricultural sector, there is labor *shortage* in that sector.

While dualistic models assume that low productivity of labor in agriculture is due to labor surplus, one can also argue that low labor productivity is due to capital shortage in that sector. In that case, the solution to the low productivity problem in agriculture would be a trasfer of capital *to the agricultural sector* rather than a transfer of labor from that sector. With labor surplus in the agricultural sector, the marginal product of capital in that sector will be higher than in other sectors. Optimal allocation of resources in the economy will imply the transfer of capital to the agricultural sector.

Dualistic models have avoided this possibility by assuming that no capital is used in the agricultural sector. This assumption makes it possible to transfer labor to the industrial sector but not capital to the agricultural sector. This assymetry of input use cannot be justified either on theoretical or empirical grounds. Even the most primitive form of agriculture in LDCs uses some form of capital (eg. hoes, cutlasses, insecticides, new and improved seedlings) and these are important sources of productivity increases in the agricultural sector that dualistic models neglect. In cases where authors have allowed for technical progress in agriculture, it is assumed that technical progress in agriculture lags behind technical progress in industry. Certainly the "green revolution" has proved this assumption to be untrue. The experience of developed countries, especially the United States, after the Second World War also indicates that technical progress in industry is not necessarily faster than in the agricultural sector. It appears that some important links in the development process are assumed away by dualistic models.

Second, there is the implicit assumption of full employment at all times in the modern sector. In addition, it is also assumed that the modern sector has an infinite capacity to create jobs to absorb all labor that is transferred from the agricultural sector. This assumption would be a realistic one if more jobs are created in the urban sector than the rate of labor transfer from the rural sector or if there was a mechanism to ensure that the total number of labor transferred from the rural sector exactly matches the number of jobs created in the urban sector. Todaro (1969) has argued that each job created in the urban sector brings more than one laborer from the rural sector to the urban sector to compete for that job.

4 See Eicher and Witt (1964), and Desai and Mazumdar (1970).

Invariably, not all labor moving from the rural to the urban sector will be successful in acquiring one of the small number of jobs created in the urban sector.

The third assumption is that agricultural surplus can be easily transferred to finance investment in the modern sector. This rests on the assumption that there is a landed aristocracy that can and do squeeze some surplus out of subsistence farmers to finance investment in the industrial sector as argued by dualistic models. While this assumption may be realistic in some parts of the developing world, it is generally not true in Africa where land is communally held. Even where there is an aristocracy to "levy" a share of agricultural output from farmers, there is no reason to believe that such resources will be efficiently invested in the industrial sector. There is no reason why these resources will not be spent on conspicuous consumption or put in foreign bank accounts.

Finally, it is assumed that as more resoruces are transferred from the agricultural sector, *labor productivity in that sector increases.* With less people to feed in the agricultural sector, increased productivity implies that there is more agricultural surplus to be transferred to the industrial sector. All this is supposed to happen without increased investment in the agricultural sector. It is rather surprising that productivity in the agricultural sector will increase just by withdrawing labor and other resources. This will only be possible if the marginal productivity of labor is negative in agriculture. In Subsaharan Africa where it is the young and productive rural dwellers who migrate to the urban areas, one would expect productivity in agriculture to decrease with rural to urban migration if there is not an infusion of capital to compensate for the labor loss.

If any of these assumptions is not fulfilled, there will emerge unemployment in the modern sector and the dynamic industrialization process will come to a halt. While unemployment increases in the industrial sector, output decreases in the rural agricultural sector. Economic growth therefore will come to a standstill. How have dualistic development models fared as far as job creation and the absorption of labor in the urban sector are concerned? In the next section, we discuss the evidence from African countries to see whether the theory has worked for these countries.

III. Tropical African Experience

With the exception of Liberia and Ethiopia, all African countries have a common heritage of colonial domination and hence their economies

bore all the characteristics of the colonial economy at independence. The colonial economy is characterized by a small export agricultural (mining) sector and an urban "industrial" sector that services the export sector. These two sub-sectors form the modern enclave, use modern technology, and production is organized along commercial lines. The rest of the economy consists of subsistence agriculture characterized by low productivity, stagnant technology and resistance to change (Paauw and Fei, 1973). These economies are highly open in the sense that a large proportion of GNP is dependent on foreign trade and the export sector tends to provide the growth stimulus to the economy.

At independence, the growth strategy that naturally came to African countries were those advocated by dualistic development theory. Following economic development thinking at that time, there was an emphasis on the rapid development of the industrial/urban sector with resource transferred from the agricultural sector. Though the details of implementation differed among countries, the essentials were the same — direct government involvement in the trasfer of resources from the agricultural sector to the industrial sector. Markets were not to be trusted to ensure this resource transfer at the desired pace. Some countries (eg. Ghana and Zambia) stressed the industrial sector to the complete neglect of the agricultural sector while other countries (eg. Ivory Coast and Malawi) encouraged and expanded the agricultural export sector to increase the transferrable surplus from this sector. Not only labor was transferred to the industrial sector; other complementary inputs were also transferred.

Policies designed to achieve this transfer include the overvaluation of domestic currencies combined with exchange controls, subsidies to the industrial sector financed by taxing agricultural exports, restrictive trade policies that protected domestic industry, food price controls in urban areas, as well as minimum wage laws that applied only to the urban industrial sector. These policies, besides providing direct subsidies to the industrial sector, also changed the domestic terms of trade in favor of the industrial sector.[5]

With the transfer of resources from the agricultural sector to the modern sector, one would expect a rapid growth in employment in that sector and with it sustained growth in employment of African economies as dualistic development theory maintains. Employment creation in African economies has, however, been generally slow. The industrial sector has generated less employment than other sectors; employment growth in that sector has been the slowest among all sectors.

[5] For details of policy instruments and their implementation, see Paauw and Fei.

According to studies conducted by the International Labor Organization (ILO), urban unemployment and underemployment in African countries ranged from 40 to 60 percent of the urban labor force in some African countries.[6] This high rate of urban unemployment is a post independence phenomenon. As indicated above, this increase in urban unemployment is not limited to the poor growth performers; the relatively high growth countries suffered a similar fate. For example, in the Ivory Coast — a country that is generally perceived to have grown relatively fast by African standards — open urban unemployment in the 1970s was estimated to be 15.4 percent while the rural unemployment rate was 0 percent.[7] In Abidjan, the capital city, the ILO estimated the unemployment rate at 20 percent. Similar high rates of urban unemployment have been calculated for Cameroon, Gabon, Malawi, Botswana, Kenya, Nigeria, and Togo, all countries that have been fast growth countries, at least by African standards. The picture is much more bleak for the economies that have stagnated such as Ghana, Guinea, Zambia, and Tanzania. For such countries, urban unemployment stands at 40 percent or more.

The topic we are dealing with requires unemployment data disaggregated by sector. However, unemployment data in African countries, even at highly aggregated levels, is hard to come by and also unreliable. Since unemployment data in African countries are very scarce even though the topic requires disaggregated unemployment data, we use the few data that we can find to illustrate our argument without going into any detailed statistical analysis.

Table 1 shows the structure of production and employment in Subsaharan Africa in the early 1980s. While industry and the service sector accounted for 27 and 40 percent respectively of GNP, the corresponding figures for employment are 11 and 17 percent respectively. While the shares of GNP contributed by these sectors have been increasing, their shares in employment have been decreasing. This indicates that contrary to the assertions by dualistic theorists that a nation could industrialize with "unlimited supplies" of labor (an apparent assumption of labor intensive industrialization), these sectors are not labor intensive. For any given output, these sectors absorb less labor than the agricultural sector. For the industrial sector to absorb any sizable labor force, it must grow at extremely fast pace. Unfortunately, despite the best efforts of governments to tax the agricultural sector to finance industrialization, industry has only grown at a modest pace, at best, in Africa.

6 See ILO (1976).

7 See Joshi et al. (1978).

Table 1

TROPICAL AFRICA STRUCTURE
OF PRODUCTION AND EMPLOYMENT

Sector	Share in GDP	Share in Labor Force (1980)
Agriculture	33%	72%
Industry	27	11
Services	40	17

Source: World Bank, *Toward Sustained Development in Sub-saharan Africa: A Joint Program in Action,* World Bank Publication, Washington, DC, 1984.

Table 2 shows the sectoral distribution of unemployment for selected African countries in the mid 1970 and early 1980s. Though only a few countries are represented in the table, a general pattern emerges. While there is no unemployment in the agricultural sector, there are very high rates of unemployment in the urban industrial sector.[8] As argued above, the coexistence of high rates of urban unemployment and labor shortages in the rural sector was not limited to stagnating African countries, nor was it limited to those with low levels of industrialization; all African countries suffered this fate.

To further investigate the relationship between resource transfer to the industrial sector and employment growth in Africa, we regressed the

Table 2

SECTORAL UNEMPLOYMENT RATES
AMONG SELECTED AFRICAN COUNTRIES

Country	Total	Sector	
		Agriculture	Industry
Cameroon	1.17%	0.0%	17.43%
C.A.R.	6.11	0.0	15.64
Ghana	8.10	0.0	43.90
Togl	2.00	0.0	21.90

Source: Calculated from *World Tables III, Social Statistics,* Johns Hopkins University Press, Baltimore, MD, 1983.

[8] It must be recognized that seasonal unemployment in the agricultural sector cannot be avoided in Subsaharan Africa where agriculture is mainly rain-fed.

unemployment rate on a number of variables that proxy a development strategy emphasizing industrialization using data from some African countries during the 1970s.[9] Total unemployment rate is regressed on the growth rate of industrial and non industrial output (INGRA and GRATE), investment ratio (INVEST), industry's share of GNP (INSHARE), and the growth rate of urbanization (GURB). To account for unemployment caused, possibly, by high growth rate of the labor force, we included the growth rate of the total labor force (GLAB). Per capita GNP (GNPCAP) was included as a scale variable to control for the possibility that the unemployment rate is systematically related to the level of development. The equation we estimated is:

$$(1) \quad \text{UNEMP} = \alpha_0 + \alpha_1 \text{GRATE} + \alpha_2 \text{INGRA} + \alpha_3 \text{INVEST} + \alpha_4 \text{INSHARE} + \alpha_5 \text{GURB} + \alpha_6 \text{GLAB} + \alpha_7 \text{GNPCAP} + \mu$$

where μ is a stochastic error term and all other variables as defined in the text.

If industrialization can create enough jobs to absorb all labor transferred to the industrial sector as in the Lewis model, then unemployment rate should not be positively related to the rate of industrialization or for that matter, to the rate of urbanization. A positive coefficient of INGRA, INSHARE, or GURB would imply that the Lewis/Fei-Ranis development model increases unemployment in African countries. We make no predictions about the expected coefficients of the other variables because our prime interest is in the industrialization and urbanization variables. Ordinary Least Squares estimates of equation (1) are presented in Table 3.

Table 3 shows that a relatively large proportion of the variation in unemployment rate in African countries is explained by the regression equation. The adjusted R^2 is relatively high for a cross sectional data. Collinearity diagnostics did not reveal any serious collinearity problem. GRATE, INVEST, GLAB, and GNPCAP have negative coefficients. The coefficients on GRATE and INVEST are, however, statistically insignificant. The negative and significant coefficient of GLAB implies that high

[9] The countries in the sample are Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Congo, Ethiopia, Gabon, Gambia, Ghana, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Niger, Nigeria, Senegal, Sierra Leone, Somalia, Sudan, Tanzania, Togo, Zaire, and Zambia. The choice of the sample was dictated by the availability of unemployment data. The unemployment data come from ILO *International Labor Statistics*, (Geneva, ILO, 1984), while data for the other variables were calculated from World Bank, *World Development Report*, various years.

growth rate of labor force cannot be the cause of high rates of unemployment in African countries. The negative coefficient of GNPCAP indicates that high income countries in our sample tend to have low rates of unemployment.

As far as this study is concerned, the coefficients of interest are those of INGRA, INSHARE, and GURB. From Table 3, we find that all these coefficients are positive and significantly different from zero at $\alpha = .10$ or better. This means that, far from creating jobs to absorb labor, a strategy of industrialization at the expense of the agricultural sector leads to an increase in unemployment in the economy as a whole. This result is not surprising given that industrial technology tends to be labor saving and capital using and also given the fact that industrial employment search means leaving employment status in the agricultural sector for very long stints in unemployment status in the industrial sector. This result seems to be consistent with the generally critical view we have taken of dualistic development strategy as implemented in Africa.

We note however that the regression equation should be interpreted with caution in view of the small size of the sample. Second, this result, although it may hold for cross national analysis, may not hold for a particular country through time. Confidence in these coefficients can increase only when studies such as these are conducted with various data sets and methodologies. This exercise it is hoped, at least, is a beginning of such efforts. This statisical exercise, though crude, gives some support to our argument that the Lewis/Fei-Ranis model of development inevitably leads to unemployment. It appears from all indications that dualistic models of development, at least, as implemented in Africa has led to high rates of

Table 3

OLS ESTIMATES OF UNEMPLOYMENT RATES IN SUBSAHARAN AFRICA

Variable	Coefficient	t-Value	Statistics
Constant	11.047	1.759	$R^2 = .7598$
GRATE	−0.866	−0.981	$R^2 = .5730$
INGRA	0.930	2.143	F=4.83
INSHARE	0.388	1.981	SSR = 8839
INVEST	−0.415	−1.218	N = 27
GURB	1.676	2.258	
GLAB	−3.480	−1.649	
GNPCAP	−0.025	−3.111	

urban unemployment. What are the reasons for these failures? Some of the reasons has to do with the assumptions of dualistic theory; others are related to particular policy instruments used to implement dualistic models in African countries. We discuss some of these reasons in the following paragraphs.

The underlying assumptions of dualistic theory are, at best, questionable. The assumption of perpetual full employment in the urban area is untenable. There is no mechanism in dualistic theory that shows how job creation in the urban sector will be matched with labor release from the agricultural sector. The labor release/absorption assumption is based on the premise that technical skills required in the industrial sector are the same as those required in the agricultural sector, hence without retraining, agricultural labor can be absorbed in the industrial sector. Technical requirements in modern industry is such that agricultural labor will need substantial retraining before acquiring the necessary skills to be employed in the industrial sector. Such retraining could take a long time and a lot of resources. Meanwhile the few jobs created in the urban industrial sector go unfilled because of the mismatch of jobs and skills. In fact this is what happens in Africa where industry relies on expatriates for the supply of technical skills.

This assumption also shows a remarkable disregard for the operation of urban labor markets by dualistic theorists. The assumption of full employment implies an instantaneous employment of labor transferred to the industrial sector, indicating that there is no friction in the operation of the labor market. However, job search theory suggests that labor moves to the urban sector before searching for employment in that sector instead of the implicit assumption that rural laborers essentially "move to the urban sector with their jobs." Even if there were enough jobs created for all the labor transferred from the rural sector as well as the natural increase in the urban labor force, there will still be urban unemployment because of friction in the urban labor market.

In the meantime, because of high rents to be earned by labor employed in the urban sector, short to medium term unemployment is a profitable undertaking for the rural to urban migrant. Labor migration from the rural to urban sector continues in spite of high urban unemployment. Todaro (1969) has argued that from the individual migrant's cost benefit calculus, the movement from employment in the rural sector to unemployment status in the urban sector makes economic sense. However, from economic development standpoint, the most important issue is whether this labor transfer is efficient for the economy as a whole. Obviously, a movement from employment and production in the agricultural

sector to unemployment status in the industrial sector cannot increase the welfare of the citizens of that country regardless of the differences in productivities of labor in the two sectors.

Second, it is assumed that dualistic landlords will transfer agricultural surplus for investment in the industrial sector. However, in Africa, there are no dualistic landlords: even if there were, they would not necessarily be the same people who have interest in the industrial sector. For transfers to be possible within the African context, there has to be a different mechanism to effect the transfer. Such intersectoral transfers could be achieved through efficient financial intermediation. However, financial intermediation is very weak in most LDCs in general, and Africa in particular. Therefore implementation of dualistic development models in Africa has relied on methods that borders on "extortion" by governments to achieve the desired transfer of resources to the industrial sector.

From the point of view of efficient resource allocation, it is not clear that resources transferred from the agricultural sector to the industrial sector will be better utilized in that sector than in the agricultural sector. Even where profits have been generated in the industrial sector, they have not been plowed back into that sector for more investment. Such profits have tended to go to expenditures on sophisticated consumer imports or are deposited in foreign bank accounts.[10] Such profits are therefore not available for reinvestment in African countries. On the other hand, profits in the agricultural sector generally go to improve farms and the rural economy in general.

Third, dualism is based on the notion of differential but constant production technology in the two sectors. Yet in developing the theory, particularly employment creation aspects, dualism completely neglects the nature of production technology in the industrial sector. Because production in the industrial sector is based on technology imported from industrialized countries, production technology tends to be labor-saving and continues to be so as wages increase in industrialized countries. Because of this fact, job creation lags behind industrial production. For example, between 1970 and 1980 when industrial output in Subsaharan Africa grew at an average annual rate of 3.4 percent, employment in that sector grew at an annual rate of 1.3 percent.

When analyzing employment creation effects of dualistic development

10 This may, in part, be due to unstable political environments in most African countries. Of course dualistic development models, like most economic theory, completely neglect political factors that may be crucial in the successful implementation of development policies.

theories in Africa, one should also consider the mechanisms for resource transfer. The instruments used to achieve resource transfer in Africa have included exchange rate policies, subsidies on capital and intermediate goods imports, as well as interest rate subsidies, among others. All these policies tend to subsidize capital inputs while minimum wage laws tend to increase the cost of labor. This reduces the rental/wage ratio and therefore increases the inputs of capital relative to that of labor. This leads to fewer jobs being created in the industrial sector than would otherwise be if capital was not subsidized.[11]

Even though the modern sector is not able to create jobs for the available labor force, dualistic development strategies as implemented in African countries have resulted in rapid urbanization in Africa. While the average annual rate of population growth in Subsaharan Africa between 1970 and 1980 was 2.8 percent, the urban population grew at an annual rate of 6 percent. More important for sectoral allocation of resources is the fact that the urban population is concentrated in a few large cities. For example, in 1970, the ratio of the population in the largest cities to the total urban population was 26 percent. By 1980, this ratio had increased to 34 percent.[12] The implication of this rapid rate of urban concentration is that more and more resources have to be used to provide social overhead capital (such as sewerage systems) in the urban areas instead of investment in directly productive activities.

This means that the proponents of dualistic development models actually underestimate the true cost of labor in the urban areas. While they consider the private cost of labor in the urban sector, they do not consider the opportunity cost of transferring labor to the urban sector, including the investment in social overhead capital to make the urban centers habitable. These investments could be very large relative to the resources of most African countries.

From theoretical and practical standpoints, the neglect of agricultural development in dualistic growth theory poses two developmental problems. Agriculture is generally the major source of foreign exchange necessary to import capital and other producer goods for the industrial sector. The neglect as well as the increased taxation of the agricultural sec-

11 For example, Clark finds that in Ghana imported materials were substituted for domestic ones in response to trade and exchange rate policies. He also finds evidence of increasing capita/output ratios as a result of trade, exchange rate, and subsidization of capital policies. See Clark, *Foreign Trade Regimes and Economic Development: Ghana,* Columbia University Press, New York, 1974.

12 See World Bank, *Towards Sustained Development in Sub-saharan Africa: A Joint Program for Action,* 1983.

tor implies that output in this sector declines or stagnates, at best; hence a reduction in foreign exchange to import investment goods for the industrial sector, leading to general economic stagnation. Second, neglect of the agricultural sector implies that incomes in this large sector of the economy stagnates. Markets for industrial goods are therefore necessarily constrained; therefore domestic industry cannot take advantage of economies of scale. The neglect of the market link between agricultural incomes and industrial development is very serious since production cost in African industrial establishments tend to be high partly because of the small sizes of these establishments. These small sizes are in part due to small sizes of domestic markets.[13]

To investigate the relationship between industrial development and the development of agriculture, we used data from The World Bank's *World Development Report 1987* to calculate the correlation between agricultural growth rate and the growth rate of the industrial sector in Subsaharan African countries during the 1965-80 and 1980-1985 periods. The calculated Pearson's correlation coefficients are .68 and .51 respectively for the two periods. Both correlation coefficients are significantly different from zero at $\alpha = .05$, indicating a relatively high degree of association between growth rate of the agricultural sector and that of the industrial sector. Though correlation does not indicate the direction of causation, correlation analysis is a simple way of showing the interconnection between the sectors.

Correlation does not establish the direction of causation. The relatively high correlation we find between agricultural growth and industrial growth could be due to the fact that agricultural growth causes industrial growth; it could be the result of industrial growth causing agricultural growth or it is possible that causation could be bi-directional. We use Granger causality (Granger, 1969) and data from The World Bank, *World Development Report,* various years to investigate the direction of causation between the growth of agriculture and industry. In so doing, we control for other variables that affect growth in these sectors (eg. investment, employment growth etc.).[14] We used Sargent's (Sargent, 1976, 1979) test for Granger causality, in part because of ease of implementation, and allow for a five period lag.[15]

13 See Fransman, *Industry and Accumulation in Africa,* 1982.

14 We note that the fact that X does not Granger cause Y does not imply that Y is independent of X. Granger causality only establishes necessary but not suficient conditions for exogeniety of variables. It is possible for the data to reject the hypothesis that X Granger causes Y, even though Y depends on X.

15 The lag length in the information set was chosen on the basis of preliminary estimates of partial autocorrelation.

The calculated F statistics for the hypothesis that agricultural growth Granger causes industrial growth and industrial growth Granger causes agricultural growth are 2.981 and 0.869 respectively. We therefore conclude that agricultural growth Granger causes industrial growth but industrial growth does not Granger cause agricultural growth. The fact that industrial growth does not Granger cause agricultural growth does not, however, imply that industrial growth has no impact on agricultural growth. The result of the Granger causality test shows that agricultural growth causes industrial growth; it does not show that agricultural growth is independent of industrial growth.[16]

The result of the Granger causality test and the relatively high degree of correlation between industrial growth rate and agricultural growth rate in Subsaharan Africa implies that by improving productivity and output in the agricultural sector, African countries can increase industrial output as well. Of course it is possible that improving industrial productivity could improve agricultural production. It is therefore important that development policy should not try to develop one sector at the expense of the other.

Dualistic development theory neglects the role of social institutions and power relations in the allocation of national output. These models assume that labor is passive; following the dictates of wages determined by market forces only. Unfortunately, political forces can, and do, influence the market prices of inputs. Urban industrial labor, because of its concentration in a few geographical locations, can, and do organize into strong labor unions to ask for higher wages and lower prices of consumer goods, especially food, than market forces would dictate. This implies that by sheer political organization, urban labor is able to turn the terms of trade against agriculture. This further distorts factor as well as product markets in LDCs; hence resource allocation and economic development.

Income transfers from agriculture to the industrial sector results in rents for the industrial sector. The size of this rent is not related to efficiency of production but to political as well as social connections. Therefore all enterpreneural and managerial energies are spent on increasing the total size and one's share of this rent rather than engaging in productive activities to increase total output. This diversion of productive

16 Given the fact that development policy in Subsaharan Africa has been one of taxing agriculture to finance industrialization without a reverse transfer or benefits, the result of the Granger causality test is not surprising. The result is also reasonable since industrial output depends upon imported inputs and technology financed by agricultural exports while agricultural production uses local "traditional" technology.

energies to nonproductive activities is what Buchannan *et al.* have referred to as a *rent seeking economy*.[17] Rent seeking activities result in reduction in production, corruption, and general economic stagnation.

One other unintended result of the transfer of "surplus" from the agricultural sector to the industrial sector is to change the distribution of income in favor of the small urban industrial sector at the expense of the agricultural sector. For example, in Ghana where there was a massive transfer of resources from the agricultural sector to the industrial sector, the Gini coefficient of income distribution rose from .228 in 1958 to .346 in 1968.[18]

It is therefore not surprising that the ILO finds that the majority of the poor in LDCs are in the agricultural sector. Dualistic development policies and practices have led to the development of underdevelopment of the agricultural/rural sector of African economies. Unfortunately, it has not led to the development of the industrial sector to compensate for the underdevelopment of the rural sector. The record of dualistic development theories, at least as implemented in African countries, is not consistent with the objectives of the theory: far from economic development, it has led to underdevelopment and stagnation.

The policy implication is that development policy of expanding industrialization at the expense of the agricultural sector during the transition is bound to fail, at least in Subsaharan Africa. While it is necessary to recognize the dual nature of some aspects of African economies, it is equally important to recognize the critical role played by the agricultural sector in the process of economic development. Therefore it is necessary to increase productivity in the agricultural sector like that of any other sector. While industrialization may be necessary, it cannot be at the expense of agricultural development. Industrialization via forced transfer of resources from the agricultural sector will not only underdevelop the agricultural sector, it will also slow down the industrialization process itself, and will eventually lead to economic stagnation as has happened in most Subsaharan African countries.

IV. Conclusion

Dualistic development theories, as implemented in African countries,

[17] See Buchanan, Tollison, and Tullock, *Towards a Theory of Rent Seeking Society*, 1980.
[18] See Killick (1978) and den Tuinder (1978). For more on the role of sectoral emphasis in determining income distribution in Africa, see Gyimah-Brempong (1988).

have yielded results that are contrary to what they were supposed to yield. Instead of rapidly expanding employment in the urban/industrial sector, employment in this sector has stagnated, at best, resulting in large scale urban unemployment. Second, it has led to declining agricultural production, widespread poverty in the rural sector, and stagnating economies.

The major reasons for this state of affairs are that dualistic theories are based on assumptions that do not pertain to the African context; they are also inconsistent with the received knowledge in economics as far as efficiency of resource allocation is concerned. Second, these theories do not analyze the nature of power relationships between the two sectors; therefore they misanalyze the nature of the interactions between the rural and urban sectors. Finally, implementation of dualistic development policy in Africa has involved direct allocation of resources and the distribution of output by governments. This has often led to serious distortions and therefore inefficiency in African economies, resulting in economic stagnation. The major lesson is that dualistic development theory, at least as applied to Tropical Africa, needs rethinking and realistic appraisal before being applied to these countries.

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