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THE POPULAR SECTOR: A FRAMEWORK FOR THE ANALYSIS OF URBAN EMPLOYMENT PROBLEMS IN KENYA.

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ABSTRACT

The paper begins with a very short summary of the growing employment problem in urban areas of Kenya, in particular Nairobi, and an equally short description of some of the current approaches to analyzing this problem. The paper goes on to argue that while categories like the informal sector, the intermediate sector, and the small scale family enterprise sector have been and continue to be very useful for describing a group of activities and the job creation potential of these activities; they do not provide any concrete way of predicting the conditions under which that potential will be realised. It is then suggested that one way of making such predictions is by analyzing the make-up and expected future of communities within Nairobi where most of the least fortunate residents of the city live. It is finally argued that this analysis can be done using methods developed for analyzing entire less developed countries, for these countries are often in situations of dependence similar to that of low income communities within Nairobi.

The primary concern of this paper is the urban employment problem which seems to be developing in Kenya. As is well known, there are manifold difficulties in discussing the problem of unemployment in LDC's. The basic problem is the existence of a very large gray area between what should clearly be defined as employment, and what should clearly be defined as unemployment. Attempts at solving the problem seem to range from simple emulation of MDC practices to a complete redefinition of the problem as one concerning not simply the existence of some sort of job, but instead whether there exists an opportunity to earn a reasonable income, however that might be defined. But regardless of the measurement (and conceptual) problems involved, it is clear that there is a very real employment problem in Kenya. ILO figures suggest approximately 25 per cent of the urban population and 40 per cent of the rural population should be included in a category which they call the working poor. That the bulk of the problem lies in the rural areas is clear when it is remembered that 90 per cent of the population of Kenya lives in rural areas. Nevertheless, the urban employment problem is important as well; for the situation in urban areas is unprecedented, and adjustments to urban poverty must therefore consist of creation of new patterns of behavior. It also seems clear that the problem of urban underemployment (or the problem of the urban working poor, or the problem of disguised unemployment in urban areas, etc.) is getting worse, for in the period following independence, the African population in urban areas was increasing at a rate of over ten per cent, while the total enumerated urban employment was rising at a rate of less than one and one-half per cent. Moreover, this is not a situation which can be easily remedied by more rapid modern or enumerated sector growth, for this sector was growing at the very respectable rate of eight per cent per year during the period in question.

The first reaction of many development economists to these figures might well be a conclusion that under the circumstances it is simply impossible to create enough jobs to go around. Such a reaction is undoubtedly in part a product of a point of view which results from using a dual economy model of the Lewis/Fei Ranis type to conceptualize the process of economic development. In this sort of model, developing economies are assumed to be comprised of two distinct sectors, often called the "traditional" and "modern" sectors. The modern sector is characterised by the use of modern (MDC) technology and resultant high worker productivity, while the traditional sector utilizes much more rudimentary techniques and is characterized by low average productivity of labour, and very low marginal productivity of labour. Then assuming that growth in output and development are, if not synonymous at least very closely related (a common assumption thought to be indefensible by some), the way to

develop is to create and fill additional modern sector jobs through capital formation in the modern sector. This will increase modern sector output without appreciably lowering output in the traditional sector, thereby increasing overall output. Certainly this is a highly simplified account of the structure and strategy of dual economy models. But it may well be that just such simplifications are important in molding the outlook of many of the economists familiar with such models. At any rate, while these models were developed with non-African underdeveloped economies in mind, they in some respects describe African economies, and in particular the economy of Kenya. In the first place, it seems clear that the colonial powers in Kenya created a modern agricultural economy alongside a traditional African economy based upon subsistence agriculture or pastoral activities. This resulted in two identifiable sectors, the modern sector consisting of that segment of the population which worked either in modern commercial agriculture, or in the peripheral activities (often centered in urban areas) necessary to support this sort of agriculture and those earning high incomes from it; and the traditional sector composed of that segment of the population which continued in more or less pre-colonial African economic roles. It also seems likely that the average and marginal product of labour was indeed higher in the modern sector than in the traditional sector. More important is the fact that the basic dual nature of the Kenyan economy, especially at independence, made available options or at least encouraged the use of options which in turn encouraged the basic strategy suggested by dual economy models- capital accumulation in the modern sector.

First, redundant members of any traditional economic unit had the possibility of migrating to areas of modern sector activity (and particularly urban areas) in search of jobs. This possibility was and is greatly facilitated by the extended family system in Kenya. Clearly such a possibility is at the heart of the mechanism for development suggested by dual economy models. Another important factor was that the modern sector in Kenya depended upon trade for the provision of a large variety of consumer and producer goods. The resulting familiarity with the use of the trade mechanism encouraged its utilization for the transformation of fairly simply produced primary products into the modern capital goods required for rapid capital accumulation in modern sector activities. This significantly lowered the skill requirements for capital accumulation. Finally, the existence of a modern sector already engaged in substantial foreign trade also aided the efforts of Kenya to attract foreign capital.

Then capital formation in the modern sector suggested by dual economy models in part came to be a matter of using foreign savings (primarily in the form of direct private investment) to purchase foreign capital goods which when installed create modern sector jobs. Under these circumstances "job creation" is just that, and it is little wonder that some of those economists steeped in the tradition of dual economy models are pessimistic about employment problems. Forgotten is a more modest view of capital formation and job creation. In this view capital formation results when a potentially redundant member of an economic unit uses his time for the creation of the tools necessary for a more roundabout means of producing a new or existing product; or uses his time to learn the skills necessary for producing a new or existing product. In this story, capital accumulation and job creation are a matter of individual choice and initiative, and at least implicitly the option remains to simply spread the available work among those available to do it. Then development results when a society encourages the necessary individual initiative. Certainly this model ignores the options described above which are available to dual economies, and in that respect adoption of dual economy models added to the insight of development economists. But the central concern of this paper is the fact that the development strategy suggested by these dual economy models simply cannot provide jobs for an increasing number of urban residents. What seems to be needed, therefore, is job creation and capital accumulation which is more akin to the type depicted in the above story than to capital accumulation in the so-called modern sector. In fact, such activity seems to be taking place in Kenya in the form of very small scale enterprises producing consumer and some producer goods with very simple methods. Realization that this is occurring, along with generally increasing concern over equity and employment problems among both economists and governments, has led a number of investigators to attempt to formulate approaches which are suited to analyze these activities and which therefore are conceivably capable of adding to an understanding of how to encourage the necessary rudimentary capital and skill formation. The central concern seems to be an attempt to delineate a new sector variously called the informal sector, the intermediate sector, the small scale family enterprise sector, or the popular sector. While it does seem clear that each of these approaches is in effect trying to broaden the narrow point of view engendered by dual economy models, and while the people who coined these terms are undoubtedly concerned with intersecting sets of people, there remains both a great deal of confusion about what the most appropriate set to consider is, and a lack of consensus as to exactly the uses to which the resultant concept should be put.

One approach is to select as the new sector a broad set of activities which can be described empirically using data drawn from a fairly varied set of situations. In particular, this seems to be the case of the sets which are meant to be defined by the terms intermediate sector and small scale family enterprise sector. For both of these definitions would seem to cover a fairly broad spectrum of enterprises which, while they may seem homogeneous when compared to the kinds of establishments often thought of in connection with the modern sector, are nevertheless a widely varied group of activities. This approach is the logical extension of dual economy models, for the activities it covers do not really fit into either the modern sector or the traditional sector, and therefore form a complementary third sector. The main use of the approach seems to be to provide a category which can be described using survey data. Such description is of value since what is being described is the type of rudimentary capital and job formation which is actually occurring in Kenya. Then the resulting information can hopefully provide insight into which activities should be encouraged as well as how best to encourage them.

Another approach is that used by the influential ILO mission to Kenya. This in essence consisted of defining what was called the informal sector as the combination of activities with the following characteristics:

(a) ease of entry;
(b) reliance on indigenous resources;
(c) family ownership of enterprises;
(d) small scale of operation;
(e) labour-intensive and adapted technology;
(f) skills acquired outside the formal school system;
(f) unregulated and competitive markets;
(h) no support from and often active discouragement by the government.

If what is hoped for is a neatly identifiable group of activities, this approach leaves much to be desired; for it by its nature seems to leave a large number of individuals and enterprises half in and half out of the proposed set. However, the approach is useful insofar as it points to the often very destructive results of an antagonistic official attitude toward the members of the somewhat loosely defined sector. This observation, that present patterns of discrimination results in a lowered level of welfare, automatically results in policy recommendations suggesting the cessation of such discriminatory behavior.

These approaches, while different in important respects, have much in common. They both state the fact that it is not possible for the modern sector to provide the number of jobs necessary to employ a reasonable percentage of those looking for work in urban areas. In turn, they stress that if those

people, otherwise unemployed, are to find work, it can only be in the sector they describe. They further suggest that the sector they describe is capable of providing a large number of additional jobs. The only problem is that neither approach really has any systematic way of forecasting what the future of the sector described is likely to be. Instead, the approaches simply provide models of the type of activity which, if the circumstances are right, might flourish and provide the necessary jobs. This in a sense is in the tradition of dual economy models; for their primary use was to describe a possible development strategy which, under the right circumstances, would provide rapid growth in output and therefore according to the definition of the day, rapid development. The difference may be that while it is often possible for governments to extend aid to or formulate policies for the benefit of specific enterprises in the modern sector, this does not seem possible in the case of the activities being discussed in this paper. Then it seems likely that government promotion of capital formation in the modern sector suggested by dual economy models is likely to be far easier to implement than government promotion of very small scale activities. Since such activities cannot be encouraged directly, what must be done is to determine the relationships necessary to sustain them, and attempt to foster environments which establish such relationships. To do this requires a model which looks at the enterprises in question, as well as the environment in which they function, in a less descriptive, more dynamic way than those outlined above.

The seed of such an approach can be found in work concerning the so-called popular sector. The popular sector is the term used by an architectural planner who is attempting to determine the important elements of successful site and service housing schemes. Such an attempt must take a comprehensive view of community interrelations. The interesting thing about the approach is that it is concerned not about a group of people engaged in similar occupations, but instead with a group of people who form a more or less independent community. Then such an approach is not in the tradition of dual economy models, for the sectors of those models were composed of groups of people pursuing similar occupations, at least to the extent that occupations classified as "traditional" are similar to others classified as "traditional", and occupations classified as "modern" are similar to others classified as "modern". But while it may be logical to interchangeably refer to the traditional sector and traditional sector employment, or the modern sector and modern sector employment; the informal sector (or the intermediate sector, or the small scale family enterprise sector) and informal sector employment (or intermediate sector employment, or small scale family enterprise employment) do not seem to have such a clear cut relationship. For it does not seem at all clear that a

household in Mathare Valley, the head of which is employed as a ticket taker in a drive in movie should be categorized as part of the modern sector. For that family spends most of its time and money in surroundings which do not at all resemble what is normally thought of as the modern sector. What seems more logical is to recognize that the family is part of a community suspended between what is normally thought of as the traditional sector, and what is normally thought of as the modern sector. It seems appropriate to characterize this community as a unit which is closely associated with both the traditional and modern sectors, but which also is in important ways an independent entity. To be more explicit, squatter settlements around Nairobi and other urban areas are often largely made up of rural immigrants, and in many ways resemble the communities which such immigrants left. One major difference, however, is that the most important source of livelihood of people in rural areas-farming-is at best a marginal activity in urban areas. First of all, this means that urban squatter'communities cannot hope to be self-sufficient, for they must rely on trade at least for a good part of their food supply. It also means that most people must support themselves with activities different from those common in the areas from which they have migrated. But it seems likely that many of the resulting activities depend upon modern sector inputs, further linking the existence of the community to the trade mechanism. Finally, it also seems likely that the community's primary source of "foreign exchange' is the income of people living in such communities who have managed to find modern sector jobs. Clearly such communities, hereafter called the "popular sector", are both dependent on and in a sense independent from both the modern and traditional sectors.

Perhaps the most important reason for defining the popular sector this way is that it is then possible to use existing models devised for studying the future prospects of less developed countries to analyze the prospects of the popular sector. This, of course, is because as it is defined, the popular sector in important respects resembles a resource poor developing country. Like such a country the popular sector is dependent on the rest of the world for basic consumer goods, raw materials for its industry, and at least some of its capital goods. Like such a country its primary salable resource is the service of its labour. And therefore, like such a country, the popular sector is heavily dependent on "foreign trade" and "foreign exchange."

Perhaps the first model which is called to mind to at least impressionistically describe the possible future course of the popular sector is some form of two gap growth model. One such model is presented in McKinnon (1962). He assumes the existence of a Leontief production function:

A1 $P=\min.(\alpha K_c, \beta K_f, \eta M) \quad \alpha>0, \beta>0, \eta>$

where P is GDP, K_d is domestically produced capital, K_f is capital produced in foreign countries, and M is foreign intermediate goods and raw materials. Units are such that one unit of P buys one unit of K_f, K_d, or M(at the present terms of trade). This would seem to be a fairly realistic assumption for popular sector production, for it seems likely that the popular economy utilizes relatively simple and inflexible technologies (in large part because of their simplicity) which require fixed amounts of foreign capital and other inputs. If we assume s is the average propensity to save out of GDP, then $I_t=S_t=sP_t$ are maximum resources available at any time for capital formation, assuming no availability of foreign savings. Now it can be seen that

$\frac{dP_t}{dt} = \frac{1}{1/\alpha+1/\beta} I$, since a change in P depends upon the level of net investment, but each new unit of capacity requires $1/\alpha$ units of K_d, and $1/\beta$ units of K_f.

Letting $\frac{1}{1/\alpha+1/\beta} = \sigma$ we have $\frac{dP_t}{dt} = \sigma I_t = \sigma s P_t$ or $\frac{dP_t}{dt}\frac{1}{P_t}=\sigma s$

Then we have :

A2 $P_t = P_o e^{\sigma s t}$

Given the production function A1 the use of foreign materials will grow at a rate: $M_t = 1/\eta\ P_o e^{\sigma s t}$, since $1/\eta$ units of M are required for each unit increase in capacity. Now, however, assume that there is a foreign exchange constraint as follows:

A3 $\max.E_t=\varepsilon P_t \qquad 0<\varepsilon<1$

where E is exports measured in the same units as P. Clearly, for growth to be possible $\varepsilon > \frac{1}{\eta}$, for otherwise there is inadequate foreign exchange to meet current intermediate goods needs. Assuming that $\varepsilon > \frac{1}{\eta}$, define $\varepsilon' = \varepsilon - \frac{1}{\eta}$.

Then in order to avoid a foreign exchange bottleneck, $I_{ft} < \max.E_t$. But $I_{ft} = \frac{1}{\beta}\frac{dP_t}{dt} = \frac{1}{\beta}\sigma s P_o e^{\sigma s t} = \frac{\sigma s}{\beta} P_t$. Therefore, to avoid a bottleneck $\frac{\sigma s}{\beta} P_t < \varepsilon' P$ or $\sigma s < \varepsilon' \beta$. If in fact $\sigma s > \varepsilon' \beta$ we will have $I_{ft} = 1/\beta\ P_t = \varepsilon' P_t$ or $\frac{dP_t}{dt} = \beta\varepsilon' P$ or $P_t = P_o e^{\beta\varepsilon' t}$. Finally, in the case where $\varepsilon < \frac{1}{\eta}$, although strictly speaking aA1 and A3 imply that P=0 this is not economically sensible. Some level of income could be sustained with available imports. Only when $\varepsilon > \frac{1}{\eta}$ however, can any positive level of output growth be sustained.

Then in this very simple model the growth of output (and employment implicitly) is linked to both saving behavior (and in turn the entrepreneurship required for capital formation) and the availability of foreign exchange. While the model in important respects is a poor representation of growth in the popular sector, it is useful in that it points to the debilitating effects of foreign exchange shortage on growth. Such a shortage seems a very real

potential problem in the popular sector. Certainly a large percentage of all capital and current inputs into business enterprises in the popular sector are "imported" in the sense that they are inputs purchased from firms and individuals not connected with the popular sector. Most tools are a clear cut example of this, and it is also true of a large variety of raw materials: gum poles, metal of all sorts, some sawn timber, textiles. etc. But given the very rapid rate of population increase in this sector, a rapid rate of growth is necessary simply to maintain present standards of living. This in turn requires a rapid increase in the availability of foreign exchange. But if, as seems likely, the availability of foreign exchange is primarily dependent upon earnings of popular sector residents working in the modern sector, it may be that the groth of foreign exchange availability will not be adequate to maintain a rate of growth of output equal to the rate of growth of population. For, even if we assume that popular sector residents maintain a constant percentage of a growing number of formal sector jobs, the rate of growth of such jobs is much slower than the rate of growth of population in the popular sector. Therefore foreign exchange earnings per resident of the popular sector must fall.

Of course, modern sector employment is not the only source of "foreign exchange". For one thing, there are a variety of occupations which involve popular sector workers providing services to modern sector residents and businesses. These include things like paper selling, shoe shining, domestic services, and a wide variety of casual labour. The growth of such income is not directly tied to the growth of modern sector employment, but many of the employment opportunities cited above may well be a function of the size of the modern sector labour force. A more thorough examination of such activities using past surveys is likely to throw additional light on this problem.

There is also the possibility that the popular sector can save foreign exchange by import substitution, or earn additional foreign exchange by exporting products produced in the popular sector. The ILO report at least implicitly seems to place a great deal of emphasis on the latter possibility. For an important theme of the book is that the selection of the goods to be produced is of great importance to the solution of the employment problem in Kenya. This is because, given the present state of technology, the production of some goods tends to be more labour intensive than the production of other goods. The report then goes on to assume that the more equitable distribution of income proposed by the mission will increase the demand for products produced with labour intensive technology. Then what is envisioned is an increased demand for popular sector products due to a leveling of the distribution of income. Clearly this sort of development would go along way toward easing any incipient popular sector foreign exchange shortage. Equally helpful would be any sort of "export promotion" campaign which involved technical

assistance aimed at enabling popular sector firms to sell additional output to the modern sector regardless of changes in the distribution of income.

Import substitution seems a promising possibility in the case of some hand tools.. But in most other instances this does not seem to be a particularly useful approach.

Unfortunately, such encouraging possibilities are matched by discouraging ones. First, is the possibility that modern sector firms using capital intensive techniques will be able to displace popular sector enterprises by producing even cheaper substitute products. This already seems to have taken place in Kenya in the case of shoes. The occurrence of the same phenomenon in a variety of other industries is often predicted by economists who are convinced that modern sector capital intensive technology is dominant, even with a very low price of labour. Another possibility springs from the fact that there are a variety of ways of changing the distribution of income, and while some of these ways may result in increased demand for popular sector products, others might result in reduced demand. For instance, such reduced demand might result if the middle to upper income brackets (say the sixth to ninth deciles) increased their share of national income while the share of the top decile declined, and the share of the first five deciles remain the same. It is interesting that a similar change in the distribution of income might result from a growing modern sector which raises the number of middle to upper income workers and therefore raises the share of national income going to the middle to upper income brackets.

Clearly, then, the future of the popular sector depends upon a wide variety of factors. Nevertheless, it might be instructive to use the simplest possible assumptions to attempt to determine the increase in "foreign exchange" availability necessary to maintain present consumption patterns in the popular sector. It seems at least possible that, given the relative simplicity of the production processes and consumption patterns in this sector, this could be done using a linear model which looked something like the following:

Minimize z subject to:

(1B) $(I-A)x-.15Bx+y \geq d$

(2B) $z-.15k'x-m'x-p'y \geq (1+g)^{10}L_M W_M$

(3B) $z-.15c'x \geq (1+f)^{10}S$

$x_i, y_i, z \geq 0$

Where: A-standard "A" matrix of input requirements.
X-vector of output of commodities 1,...,n.
B-matrix of the stock of capital good i, required for output of commodity j.
y-vector of imports of commodities 1,...,n.
k-vector of imported capital required per unit of output of commodity j.
m-vector of imported intermediate goods inputs required per unit of output of commodity j.

d-vector of final demand for commodities 1,...n in 1983.
p-price vector.
z-foreign exchange inflow.
g-growth rate of the number of popular sector residents working in or for the modern sector.
L_M-number of popular sector residents working in or for the modern sector, 1973.
W_M-average wage of popular sector residents working in or for the modern sector.
c-total capital requirements per unit of output of commodity j.
f-growth rate of savings in the popular sector.
S-saving in the popular sector, 1973.

The model is very similar to one used by Manne (1963). The approach consists in balancing important flows in a target year, in this case 1983-ten years hence. Any longer period is assumed to involve structural and technological changes which would make useful prediction extremely doubtful. It may well be that given the very rapid changes in the sector we are consdiering, a shorter period would be appropriate. This will be considered as research progresses.

The program involves minimizing z, subject to output, foreign exchange, and saving constraints. Several rates of growth are stipulated and the program finds the corresponding foreign exchange inflow which is necessary to balance economic flows in the target year. Constraint (1B) simply states that output in 1983 must be greater than or equal to demand. "d" is estimated by using data from household expenditure surveys to determine the consumption pattern of an average popular sector resident. Alternative popular sector growth rates are used to determine the population ten years hence. Using the simplest possible assumptions, i.e. that there are no changes in the population in terms of income distribution, age or sex distribution, consumption patterns, per capital income, etc., in other words that there are no changes in the consumpcion pattern of the popular sector; d is found using the new population estimate and the consumption patterns of 1973. Then different population growth rates in effect correspond to different rates of growth of popular sector demand.

The "A" matrix, foreign capital, imported inputs, and total capital required per unit of output can in large part tbe determined using existing studies of popular sector enterprises, although it is not clear that all types of enterprises have been covered. Collecting the data on enterprises not covered does not seem to be an insurmountable task, however. What will be more time consuming will be collecting data on labour input per unit of output, for some of the existing studies omit this data. While such data is not necessary to specify the above model, it clearly is of central concern to the study as a whole, for it will be used to determine employment creation porspects.

The rationale for using the 15% factor to convert stocks of investment goods into the required flow of investment in the target year is the fact that, assuming installed capacity in any process accumulates at a compound annual rate of somewhere in the range of 5%-10% per annum, the coefficient .15 yields a convenient approximation for estimating the demand for expansion in the target year.

The second and third constraints are the foreign exchange and savings constraints. The foreign exchange constraint simply states that capital goods, intermediate goods, and consumer goods imports must be less than total foreign exchange earnings plus foreign exchange inflow in the form of direct investment (both private and governmental) in the popular sector, and popular sector borrowing from modern sector financial institutions. L_M and W_M can be determined using a large survey taken in low income areas which includes information on earnings, place of work, type of work, and place of residence. "g" will be assumed to be the same as the projected rate of growth of modern sector employment. Data on saving behavior is likely to be the most sketchy. This is especially true since many popular sector residents save in the form of remission of part of their wages to rural areas. There has been some work on this problem as well as some surveys of saving behavior which can be drawn upon for specification of the model. Hopefully there are also data forthcoming from the planned household expenditure survey.

Then given this data, it will be possible to determine z, x, and y. Clearly the resulting y vector depends upon the relative scarcities of savings and foreign exchange. Assuming that foreign exchange is the scarcer resource, the resulting y may implicitly assume unrealistic changes in the pattern of production in the popular sector. This would only highlight the importance of foreign exchange, however. Using the labour input data discussed above, it will be possible to very roughly determine popular sector employment ten years hence, given favourable assumptions about modern sector capital inflow. In the simplest case, this inflow could be government funds in one form or another. Perhaps more interesting is the possibility that private investors in the modern sector will make funds available to the popular sector (including banks and possibly other financial institutions). This has already begun in the area of housing, where modern sector investors have invested in popular sector housing, and have earned very favourable returns. Of course, this sort of investment is easier to manage than other sorts of investments. But studies have indicated that, particularly in manufacturing activities, there are substantial profits to be made. Then, while there are certainly formidable obstacles to private investment in such activities, it seems possible that the kind of educated speculative behavior necessary to exploit such investment opportunities is becoming increasingly common among modern sector investors.

Undoubtedly, there is a large subset of development economists who would view such a development in the same negative light as the parallel activity at the international level, i.e. foreign direct investment by MDC investors in LDC's. The possibility of exploitation is undoubtedly strong, as seems to be demonstrated in the case of housing. In fact, given the very rapid payback periods indicated by some studies of investment in housing, increases in total investment would have to be quite rapid to avoid having profit outflow outstrip new direct investment with a resulting foreign exchange drain. Despite such dangers, some sort of capital inflow may be necessary to enable the popular sector to continue to increase output, given the skill levels and resources available to this sector. It is not possible to include in this paper a discussion of the pros and cons of direct foreign investment in the popular sector, or in LDC's in general. But certainly more will have to be said once the size of z has been determined.

Another possible method for analyzing the future alternatives of the popular sector is to use an approach similar to the one used by Chenery and Bruno (1962). What they have done is construct a model of the Israeli economy which has 12 equations in 16 unknowns, of which six are designated instrument or controlled variables, i.e. variables influenced to some extent by policy makers, and 10 are designated uncontrolled endogenous variables. The model is then used to predict the level of certain important (or objective) variables in five years time, given different feasible programs, a feasible program being defined as a set of values for the instrument variables which: (i) satisfies the four equations of a reduced form of the model (which eliminates eight uncontrolled endogenous variables), and (ii) assigns values to the instrument variables which fall within a predetermined range. The value of this approach lies in the fact that some idea of the trade offs available to policy makers is given by noting the differences in feasible programs. Of course, despite the similarities between the popular sector and other developed economies noted above, it is necessary to use a modified version of the Chenery and Bruno model to describe the popular sector. This new model contains the following variables:

<u>Uncontrolled Endogenous Variables</u>:

V_t Gross national product
C_t Private consumption
I_t Total investment
E_t Exports of goods and services
M_t Imports of goods and services
S_t Domestic savings

K_t Total capital stock

N_t Labour supply

L_t Labour demand

Instrument or Controlled Variables:

F_t "Foreign" capital inflow

u Unemployment rate

s Marginal propensity to save

e Rate of growth of exports

v Rate of growth of labour supply

l Rate of growth of labour productivity

The resulting model is designed to take into account three possible limits to growth, limits set by: (i) the supply of capital, (ii) the supply of labour, (iii) the supply of foreign exchange. The model contains six structural equations, two definitional equations, and three equations which specify resource limitations. The model is later reduced to four equations in eight variables by eliminating the seven irrelevant endogenous variables- all except V and C. A description of the model itself follows.

(1C) $V_n = V_o + \beta(K_n - K_o)$

This is simply an equation relating growth of output to growth of capital. β is an aggregate output-capital ratio which can be estimated using data gathered by several investigators concerning a wide variety of popular sector enterprises. This data can be used to estimate a weighted average of the output-capital coefficients in the important sectors of the popular sector economy.

(2C) $L_n = \lambda_o(1-l)^n V_n$

This equation determines the demand for labour from the level of output by using an aggregate labour-output ratio. l, considered to be an instrumental variable, is the rate of increase of labour productivity. It has been included in part because there seems to be some evidence that labour productivity has been growing over time as fledgling entrepreneurs gain experience, and in part because it seems likely that increases in labour productivity could be encouraged by government extension programs. λ_o, the labour-output ratio can be determined in a similar manner to the output-capital ratio using existing studies of popular sector enterprises.

(3C) $M_t = \mu_c C_t + \mu_i I_t + \mu_e E_t$

This equation states that imports are equal to the import content of consumption times the level of consumption, plus the import content of investment times the level of investment, plus the import content of exports times the level of exports. Initially, it will be assumed that exports are

all in the form of labour services to the modern sector, indicating that $\mu_e=0$. This may be an inappropriate assumption, as has been pointed out above, and it is therefore subject to change given indications about the magnitude of other exports which can hopefully be obtained from present and planned personal expenditure surveys. It seems likely that μ_i can be determined by breaking total investment into investment in tools and equipment, inventories, and land and buildings, using studies of popular sector enterprises already in existence. Then these same studies can be used to determine the import content of each of these components. To determine μ_c will be more difficult. For it will be necessary to determine not only the percentage of consumption goods which are directly imported, but also the import content of domestically produced goods. Information about direct imports can be fairly accurately determined using data from personal expenditure surveys. But to accurately determine the import content of domestically produced goods would require the sort of information necessary to solve the linear programming model presented above. In the absence of such data, it will be necessary to estimate μ_c using cruder techniques.

(4C) $S_n=S_o + s(V_n/N_n)(V_n-V_o)$

The savings equation uses information about savings in an initial year, and an average savings rate out of the change in income from the initial to terminal year which is a function of per capita income. A major problem in determining both S_o and s is that much of the income which is saved is remitted to rural areas. In fact a study of saving behavior in Mathare Valley indicated that a larger fraction of income was either saved or remitted at the lowest levels of income than at income levels in the middle range of the survey. This may indicate that lower income households are remitting all of the income they can spare and living a very incomplete existence in the popular sector, while middle income households are saving and remitting less because they are more thoroughly urbanised. At any rate, the issue of savings availability is by no means clear, and hopefully additional information can be gathered in the planned household expenditure survey which has been mentioned several times already.

(5C) $N_t=N_o(1+v)^t$

This equation simply assumes an exponential rate of labour force growth to determine the labour force in some target year. The rate of growth v is a ssumed to be an instrument variable, for it seems that there are changes which can be made to control to a certain extent the migration which is a significant portion of the growth rate of the popular sector labour force. The most important of these would seem to be job creation schemes in rural areas. Presumably estimates of v can be obtained from the fairly numerous

studies of migration done in Kenya in recent years. N_o can be determined using a variety of estimates of population in the popular sector.

(6C) $E_t = E_o(1+e)^t$

Growth of exports is here, as in the last model, assumed to be primarily dependent upon the rate of growth of modern sector employment. E_o can be determined using the Whitelaw survey, and checked using survey information gathered by other investigators. It is assumed that e is an instrument variable which can be altered by policy makers. One way of accomplishing this might be preferential hiring practices. More likely might be the establishment of extension services designed to encourage exporting by giving both technical and marketing advice. This of course would increase the import content of exported goods, and therefore would affect μ_e. In the case where μ_e is assumed to be equal to zero, the possibility of such an "export promotion" scheme cannot be accounted for in the model.

(7C) $S_t + F_t = I_t$

(8C) $M_t = E_t + F_t$

These are definitional equations which need no explanation.

(9C) $L_t = (1-u)N_t$

This equation assures the maintenance of a certain level of employment. "u" is assumed to be an instrument variable in part because it seems likely that it will be necessary to experiment with u to find realistic solutions.

(10C) $\sum_{t=o}^{n-1} I_t = (Kn - K_o)$

This equation indicates total net capital formation. In order to express the model in terms of initial and final year values only an approximation of the form:

(10Ca) $I_t = \rho(K_t - K_o)$

can be used. In this case ρ depends upon the rate of growth of investment and the length of the planning period. It can be determined in a similar manner to the determination of the figure .15 in the preceding model. While this is a fairly crude approach, some such assumption is needed to make I_n determinate.

(11C) $V_t = C_t + I_t + E_t - M_t$

These 11 equations can be simplified to the following four equations in eight unknowns.

(12C) $V_n = \dfrac{N_o(1+v)^n\ (1-u)}{\lambda_o(1-l)^n}$

$$(13C)\quad V_n = \frac{\rho/\beta\, V_o + F_n + S_o - sV_o}{(\rho/\beta - s)}$$

$$(14C)\quad V_n = \frac{(1+e)^n(1-\mu_e)E_o + (1-\mu_c)F_n + (\mu_c-\mu_i)(-\rho/\beta V_o)}{(\mu_c + (\mu_i-\mu_c)\rho/\beta)}$$

$$(15C)\quad C_n = V_n(1-s) + (s-s_o)V_o \quad \text{where} \quad s_oV_o = S_o$$

The first three equations represent respectively the labour, savings, and foreign exchange constraints faced by the popular economy. For unconstrained F, the binding constraint is 12C. Given some fixed F, however, there are three separate constraints. The last equation is always satisfied insofar as C_n is considered an uncontrolled endogenous variable. It is used to help determine the level of welfare. Then what we have is four equations in the following eight unknowns: $V_n, C_n, F_n, v, u, l, s, e$. Of these eight variables, six are assigned maximum, minimum, and intermediate values. Then it is possible to use a geometric technique illustrated in Chenery and Bruno to determine the set of "feasible programs."

Clearly the approach is open to criticism. But it does seem to be a beginning step in an attempt not simply to describe an increasingly important element of many LDC's, but instead to provide a way of predicting its future course. Then regardless of its limitations it presents what seems to be an interesting way of looking at the phenomenon.

A final comment on the Chenery and Bruno type approach concerns the fact that such an approach is easily abused. For certainly while the data and knowledge demands necessary to accurately specify this sort of model are at least as great as those necessary for, as an example, the sort of linear programming model presented above, it clearly is possible to come up with some numbers using a great deal less information. But this possibility of abuse is clearly not solely a drawback. For it seems possible that even with limited information, the model, in a sense ill-used, might provide some interesting information, and at the very least provide a framework which can prompt more careful future studies.

Then this paper has presented two possible approaches to analyzing the prospects of the popular sector, both of which seem capable of actualization. The job remains to draw together the available information. Of course, this is not the only way to approach the sector. But it does seem to point to two important characteristics of the emerging situation in Kenya. In the first place it indicates that only by encouraging very small scale activities with low capital-output ratios will it be possible to begin to solve the employment problem facing Kenya. Perhaps paradoxically, the approach also points out the importance of continuing modern sector growth to the proliferation of such activities. Clearly, this interrelationship needs to be further studied.

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