Lewis Through a Looking Glass:

Public Sector Employment, Rent-Seeking, and Economic Growth

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John B. Knight,
and
Richard H. Sabot

What Adam Smith wrote in 1776 is still broadly true: "Great nations are never impoverished by private, though they sometimes are by public, prodigality and misconduct."

Governments in developing countries should and do provide valuable goods and services, but resources are wasted when public revenues support unproductive employees (at the expense of productive workers).

The dynamic cost of such surplus labor in the public sector is potentially much more important than the static social cost normally attributed to urban unemployment. Fiscal resources are needed to support that unproductive "sink," thereby diverting resources from productive investment.

The accumulation, in little more than a decade, of even a small part of the total labor force in an unproductive sink can sap the economy of its dynamism, eliminating improvements in living standards for all but the few who obtain rent-yielding jobs.

Moreover, creating sheltered employment tends to be self-perpetuating. It creates and consolidates vested interests that seek to perpetuate the protected jobs. In the inverse of the Lewis model, the extent of surplus labor increases, rather than diminishes, over time.

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1. Introduction

In his seminal article Lewis (1954) depicted the process of economic growth as one in which labor is transferred from a traditional sector, containing surplus labor and characterized by disguised unemployment, to a dynamic capitalist, or modern, sector in which the profit calculus prevails and labor is fully employed. Lewis made no distinction between the private and state roles in the modern sector; the organization and control of economic activity were irrelevant to his model.

That distinction is crucial to this paper, however. Public enterprises and bureaucracies commonly have motives other than profits; they may be subject to political pressures for employment provision or themselves have employment objectives. We argue that the labor transfer process outlined by Lewis can give rise to surplus labor -- in the sense that the marginal product of labor is less than the wage -- in the public part of the modern sector and that this may deprive the modern sector of its dynamism. Since Lewis wrote, empirical research has cast doubt on the existence of significant non-seasonal disguised unemployment in rural areas (Berry and Sabot, 1984, pp. 100-4). Instead of labor moving from a surplus labor sector, the transfer may thus be reversed, i.e. labor leaves a sector in which income equals marginal product for one in which the wage exceeds marginal product. In this paper we view Lewis through a looking glass.

The Lewis model has been criticized for its assumption of full employment in urban labor markets. Variants have been developed which incorporate open urban unemployment and disguised unemployment in a free-entry, flexible-wage part of the urban sector (Harris and Todaro, 1970, Fields, 1975, Sabot, 1979). The excess migration and urban unemployment that equilibrates rural and urban expected incomes when the modern sector wage exceeds the rural supply price of labor has attracted much attention in the literature, but it is not well established that the social costs of such static labor misallocation are quantitatively important. In this paper, we argue that a policy response to the excess demand for high wage jobs -- of which urban unemployment is a manifestation -- in the form of public sector employment creation can incur social costs that are potentially more important because they involve waste of investment resources that can grow cumulatively over time.

The rapidly expanding literature on rent-seeking behavior and directly unproductive activities (DUPs) in developing countries, initiated by Krueger (1974) and Bhagwati (1982), is relevant to our interpretation of the policy response to unemployment. Rent-seeking in the labor market can take three forms: lobbying for rents (e.g. trade union pressures to raise wages); investing in rent search (e.g. voluntary unemployment while seeking rent-yielding jobs); and lobbying for the provision of rent-yielding opportunities (e.g. pressures for the creation of more high-wage employment). Our concern is with the third, less-thoroughly explored type.

Section 2 presents some disparate but relevant evidence on the nature and potential magnitude of surplus labor in the modern sector. Section 3 draws on public choice theory and the 'new political economy' to explain how the phenomenon might arise. Section 4 sets out a simple computable general equilibrium model designed to show that modern sector surplus labor can generate dynamic resource costs. We quantify these costs in Section 5: numerical simulations examine the response of economic growth to the accumulation of modern sector surplus labor and the sensitivity of this relationship to changes in behavioural and policy assumptions. Section 6 concludes.

2.   Some Suggestive Evidence

There appears to be a structural difference between the industrialized market economies and the developing economies with regard to public sector employment.   In the 23 developing countries for which data were available for a year near 1980 public sector employment averaged 44 per cent of total non-agricultural employment (Heller and Tait, 1983); extreme cases included Ghana (74 per cent), India (72 per cent), Tanzania (78 per cent) and Zambia (81 per cent).[1] The equivalent figure for 14 industrialized countries was 24 per cent.

Heller and Tate (1983, pp. 15-16), using cross-sectional evidence, find that public sector employment declines, ceteris

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[1]The definition of 'non-agricultural' employment is not provided but it appears to include only employees reported in surveys of establishments.

paribus, as income per capita rises. By contrast, time-series
evidence for industrialized countries suggests that they have
experienced a gradual increase in the importance of public sector
employment as their income per capita has risen (e.g. Martin, 1982,
Musgrave and Musgrave, 1980, pp. 142-3). Its importance in the
developing countries of today is, therefore, greater than would be
predicted from this historical experience, apparently because of the
more interventionist character of their governments.

Moreover, time-series evidence for some developing countries
indicates that public sector employment has been growing rapidly.
Table 1 presents a sample of 14 developing countries for which
comparable data on public sector employment are available for recent
years a decade or more apart.[2] In every case employment in the
public sector grew more rapidly than wage employment in the private
sector, and in some cases the latter declined. In a substantial
number of developing countries the public sector has been the
dominant sou. :e of employment expansion in recent years: the median
share of the public sector in the increase in total employment in our
sample was between 71 and 87 per cent.

Much of this, of course, may have been due to the growth in
provision of valued goods and services, or to the nationalization of
private enterprises. Nevertheless, the greater the size of the
public sector the greater the scope for lobbying for more jobs. The

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[2]Most developing countries do not publish statistics on public
and private sector employment.

motivation may be provided by economic rents. The mean government wage averaged 4.6 times national income per capita in the low-income countries of the Heller and Tait sample compared with 1.7 times in the high-income countries (p. 47). This may be due not only to a relative scarcity of human capital but also to wages set above the supply price of labor.

A World Bank report comments on the independent employment-creating function of public enterprises:

> Overmanning at all levels is common since public undertakings are often viewed as employers of last resort; hiring decisions frequently result from the exercise of political patronage while dismissal procedures are cumbersome and ineffective..... These practices lead to frequent losses which are almost invariably financed from the national treasury or the banking system (World Bank, 1979, p. 65).

This theme has been echoed by other researchers. Take the Indian case. Bhagwati and Desai (1970, p. 163) argued that political involvement in Indian industrial public enterprises contributed to excessive hiring of unskilled labor, whereas the private sector was less vulnerable to political pressures. Chaudhuri (1978, p. 158) argued that public enterprises had become a drain on saving, partly because of their underutilization of both capital and labor. In 1980-83, public enterprises in India accounted for 13 per cent of GDP, 35 per cent of gross capital formation but only 2 per cent of gross national saving (United Nations, 1985, pp. 171-2). Jha (1980, p. 71) explained 'the reckless expansion of the bureaucracy' as the response of successive governments to 'pressure to create jobs at any cost which they have found extremely difficult to resist'. Bardhan

(1984) noted that the incremental capital-output ratio had risen more in the public sector industries than in the private sector (pp. 29-30). He attributed this, and low capacity utilization in the public sector, to the 'pervading atmosphere of the politics of patronage'. 'Overstaffing, feather bedding, fake payrolls' and other employment irregularities in public enterprises were condoned in the general atmosphere of 'parasitism on the state' (pp. 69-70).

It has been claimed that state manufacturing enterprises in Turkey, which accounted for 36 per cent of employment in manufacturing in 1979, seriously waste resources. This was said to be condoned by government because of vested interests (Walstedt, 1980, p. 201). Managers claimed that 'the politicians would not allow us to let go of surplus personnel' (p. 202) while others argued that the managers themselves were largely political appointees who carried out political objectives, e.g., 'to increase the workforce beyond the needs of production' (World Bank, 1981, p. 26). In 1976 labor input per unit of output was higher in the public than in the private sector in all eleven Turkish manufacturing sector activities in which the two sectors were comparable, and capital input per unit of output was higher in nine cases. For a weighted average of these activities, the ratio of public to private labor inputs per unit of output was 1.97 and that of capital inputs 1.66. These figures imply that surplus labor represented half of the total in public sector enterprises, and surplus capital 40 per cent (Krueger and Tuncer, 1982, derived from Table 5).

Hill (1982) obtained similar results for the weaving industry in Indonesia. Capital per unit of output in 1977 was 1.6 times higher in public than in private enterprises in the case of fully automatic looms and 5.4 times in the case of semi-automatic looms. For labor input per unit of output, the ratio was 1.25 (fully automatic looms) or 1.90 (semi-automatic looms) owing to the employment of more operative, administrative and clerical staff. Hill explained these findings in terms of inadequate managerial incentives and political interference (pp. 1020-22).

If results such as these obtain in the manufacturing sector, they are likely to apply a fortiori to the provision of government services unrestrained by market competition. The problem has been endemic in the public service as well as in the state corporations of Ghana. Public service employment grew by 68 per cent over the period 1960-65 and a commission of inquiry concluded that 'there is widespread underemployment in the public sector' (Mills-Odoi, 1967, p. 28). But vested interests had been formed, and its recommendation that public sector employment should be considerably reduced was not implemented (Mensah, 1969, p. 21). Later Killick (1978, ch. 9) argued that overmanning remained one of the major problems of state enterprises in Ghana; and between 1975 and 1982 public service employment grew by 150 per cent.

A number of other governments, including those of Egypt, Ivory Coast, Mali, Mauritius and Sri Lanka, have explicitly acted as 'employer of last resort', particularly for university graduates

(World Bank, 1983, p. 103). In Egypt public sector employment increased from less than 10 per cent of total employment in 1960 to 30 per cent (50 per cent of non-agricultural employment) in 1976 (Handoussa, 1983, table 1, Hansen and Radwan, 1982, p. 62). Overmanning was estimated at 40 per cent in 1976 (p. 207). Because graduates were a free good to public agencies -- funds were automatically provided -- the bureaucracy had an interest in expansion, even though the marginal product of labor may well have been negative.

In Latin America, during the recent period of macroeconomic adjustment to external imbalance, consumption has declined relative to production, as expected, and private sector employment has fallen. However, public sector employment has been protected, indeed expanded, in some of these countries (Pfefferman, 1987). Brazil offers an interesting example of differences in public and private employment responses. With severe recession in 1983, output and employment in the private non-financial sectors contracted sharply while the banking system reaped seigniorage gains from accelerating inflation. With the start of the Cruzado Plan in 1986 inflation fell sharply. Over a three-month period about 150,000 employees -- some 20 per cent of the labor force -- were dis... sed as the private banking sector retrenched. The public banks made no such response, although generally in a weaker financial state than the private banks.

3. Towards a Theory of Government Employment Response

The 'new political economy' approach to government policy views government not as a maximizer of social welfare but as provider of political favours to pressure groups (Becker, 1983) or an organizer of political support for staying in power (Bates, 1983, ch. 5). Within this approach, government interventions which generate rents and cause inefficiency are frequently capable of rational explanation. Private interests seek economic rents through their influence over public policy, and governments respond in order to satisfy favoured political supporters. To governments the creation of economic rents represents a relatively costless way of acquiring political resources.

Olson (1965, 1982) has argued that small groups are better able to organize for collective action than large groups on account of the 'free rider' problem, and therefore have disproportionate lobbying power. And small organizations are, similarly, more willing to incur the costs of pressing for measures which raise their members' income by redistributing income, even if aggregate income declines, than for measures which raise the income of society in general. According to Olson, rent-seeking lobbies are like 'wrestlers struggling over the contents of a china shop...' (1982, p. 44).

We neither wish nor need to reject entirely the view of government as an exogenous maximizer of social welfare. It is sufficient that this role be tempered by elements of rent-seeking behavior. Ill-functioning mixed economies with powerful

bureaucracies and little public accountability are fertile grounds
for rent-seeking behaviour and patronage. The distribution of
patronage depends on the social and political systems. Economic
rents may be dispersed either narrowly to the few -- such as
politicians and bureaucrats in a kleptocracy -- or more broadly by
being passed down the line to favored groups -- such as party
loyalists. In many developing countries the powerful are subject to
endemic lobbying from members of client and kinship groups.
Governments are particularly prone to such influences in Africa.

Wherever rents derive from holding jobs, there is likely to be
lobbying for jobs. Lobbying for extra public sector jobs takes
various forms. It can take place at the individual level or through
group lobbying. Governments may also respond to unemployment by
creating public sector employment if they fear its consequences for
political stability. Political pressures to distribute the benefits
of a trade windfall may cause government to respond in part by
expanding public sector employment (Auty and Gelb, 1986) but when the
windfall ceases, lobbying by trade unions may maintain employment and
ailing private sector firms are likely to be taken over by government.
Freeman (1986, p. 76), in his survey of public sector unionism,
concludes that its distinctiveness lies in '...union potential to

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[3]Hyden (1983) has argued that there is a pervasive network of
support among groups connected by blood, tribe, community, and other
affinities. Such groups use political power to promote the interests
of their members, one of the methods being tribalism and nepotism in
hiring practices (p. 17). African bureaucracies and public
enterprises have been politicized through such pressures.

shift demand outward through the political process' rather than move employment along a demand curve.

The size of the surplus labor 'sink' in the public sector depends on the relative power of the employment lobby. We would expect the strength of demand for public sector employment to vary positively with the gap between the public sector wage and the supply price of labor. However, because pressures from other lobbies grow as the public sector wage bill mounts, government resistance to the employment lobby may also increase with the size of the wage gap.[4]

The introduction of a government response into a simple two-sector model is shown in Figure 1. Total labor supply is depicted on the horizontal axis, with rural employment being measured from the left hand origin O and urban employment from the right hand origin O'. On the vertical axis are measured marginal products and wages. The marginal product curves of the rural sector and the urban modern sector (sectors 1 and 2 respectively) are mpl_1 and mpl_2. In competitive equilibrium a common wage rate ($w_{10} = w_{20}$) is established and employment in sectors 1 and 2 is respectively OA and O'A.

An exogenous raising of the modern sector wage to w_{21} -- we assume that the wage in the public and private components of the modern sector is the same -- creates a misallocation of labor, with rural employment expanding to OD and modern sector employment contracting to O'D; the wage gap becomes $w_{21} - w_{11}$. The introduction

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[4]Collier (1986) uses such a countervailing lobbying framework to examine the effects of exogenous shocks on public sector employment and wages.

of a probabilistic migration relationship then creates urban
unemployment in the model. Given the simplest probability function,[5]
equilibrium urban unemployment can be shown by means of the
rectangular hyperbola h_1 h_1:[6] modern sector employment remains O'D,
urban unemployment is CD, and rural employment contracts to OC, its
corresponding marginal product being w_{12}.

Now introduce a government response to unemployment. As the
wage gap and thus unemployment increases, pressure from the
employment lobby is assumed to increase relative to pressures from
competing lobbies, so that the public sector employment response is
positive. Given unemployment CD, government responds by creating
employment in an unproductive 'sink' (sector 3), which in turn
generates more migration and unemployment, and so on, until a new
static equilibrium is reached. The new urban sector demand curve is
the sum of the labor demands of sectors 2 and 3.

In the new equilibrium, sector 2 employment is O'D, sector 3
employment is BD, urban unemployment is EB, and labor in sector 1 is
residually determined as OE. The marginal products of labor in the
sectors 1, 2 and 3 are respectively w_{13}, w_{23}, and 0.[7] The loss of

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[5]The probability of modern sector employment for a worker in the
urban sector equals the ratio of modern sector employment to urban
labour force.

[6]See, for instance, Corden (1974), pp. 145-6.

[7]For diagrammatic purposes the wage intervention is defined in
terms of w_{21} - w_{20}, the difference between the modern sector wage
and the competitive outcome. The diagram would be more complicated
if the wage intervention were defined in terms of the sectoral wage
gap w_{2i} - w_{1i} as is done in the model to be computed below.

output due to government response and consequent allocative
inefficiency is shown by the area under mpl_1 between E and C.
Quantitative results corresponding to this case -- which also take
account of the impact on productive investment of the taxation of
sector 1 or 2 to finance the sink -- and to the previous two cases
are presented in Section 5.

4. A CGE Model with Government Employment Response

The model is kept as simple as possible; it comprises three
sectors: rural (sector 1), urban (sector 2), and non-productive
government (sector 3). The productive government sector is included
in sector 2. The supply functions in the productive sectors are
Cobb-Douglas:

$$y_i = A_i K_i^{\alpha_i} L_i^{1-\alpha_i} \qquad (i = 1, 2) \qquad (1,2)$$

where y is production, A a parameter, K and L capital and labor, and
α factor shares. Wages in the productive sector are set neo-
classically by post-tax marginal products:

$$w_i = p_i(1-t_i)(1-\alpha_i)(y_i/L_i). \qquad (3,4)$$

There may, however, be a wage gap, a constant urban/rural ratio:

$$w_2 = (1 + \delta)w_1. \qquad (5)$$

The labor force is made up of employment in the three sectors
plus unemployment:

$$L = L_1 + L_2 + L_3 + U. \qquad (6)$$

Unemployment is an urban phenomenon; expressed as a proportion of the
urban labor force, its rate is therefore:

$$u = U/(L_2 + L_3 + U). \qquad (7)$$

The wage gap is assumed to induce excess migration and urban unemployment, as in the Harris-Todaro model. If the probability of urban employment depends on the ratio of urban sector employment to urban labor force, (7) can be expressed as $u = (w_2 - w_1)/w_2$ (e.g. Fields, 1975, pp. 167-8). However, as this generates implausibly high rates of unemployment for plausible values of the wage gap, a migration 'damp factor' ($m \geq 1$) representing, for instance, risk-aversion, psychic costs of migration, or lack of information on the part of rural dwellers, is introduced:

$$u = (w_2 - w_1)/mw_2. \tag{8}$$

Government attempts to absorb some of the unemployed in the unproductive sector, employing them at a wage equal to that in the urban productive sector:

$$L_3 = gU. \tag{9}$$

Government is assumed to respond to urban unemployment, rather than directly to the political pressures generated by the wage gap, but the unemployment rate is itself a function of the gap. If government responds to pressures from rural workers as well as from the unemployed, its response parameter, $g \geq o$, may take a high value.

Public workers cannot be <u>seen</u> to be idle. In order to create the impression of jobs, the government may also provide workers in sector 3 with capital (K_3), although the sector is assumed to produce nothing of value. Examples would be the establishment of public enterprises producing zero value added at world prices, or the construction of office buildings for workers in the sink. The

capital intensity of sector 3 is some fraction, $q \geq 0$, of that of sector 2.

$$K_3 = qL_3 (K_2/L_2). \tag{10}$$

The returns to capital in the other sectors are given by:

$$K_i r_i = p_i (1-t_i)y_i - w_i L_i. \qquad (i = 1,2) \tag{11, 12}$$

To finance sector 3 the government levies taxes on total outputs of sectors 1 and 2 at tax rates t_1 and t_2. The government budget is balanced:

$$\sum_{1,2} p_i t_i y = w_2 L_3 + [qp_1 + (1-q)p_2]I_3. \tag{13}$$

Investment in sector 3 depends on the depreciation rate (d):

$$I_{3,t} = K_{3,t+1} - (1-d) K_{3,t}. \tag{14}$$

Total demand is the sum of factor payments after tax in the productive sectors plus government expenditure. Value of demand D equals value of supply, and markets clear:

$$D = \sum_{1,2} K_i r_i + \sum_{1,2} w_i L_i + L_3 w_2 + [qp_1 + (1-q)p_2]I_3. \tag{15}$$

$$D = \sum_{1,2} p_i y_i \tag{16}$$

$$D_i = y_i. \tag{17}$$

Demand is Cobb-Douglas, so that real demands D_i are:

$$D_1 = qD/p_1 \tag{18}$$

$$D_2 = (1-q)D/p_2. \tag{19}$$

In the conventional CGE model prices clear markets and inputs determine outputs. Here output in sector 3 is independent of inputs

and tax rates adjust endogenously to satisfy the government budget
constraint and clear markets by reconciling absorption with output.

The model is updated via labor force growth, technical change
and capital accumulation:

$$L_{t+1} = L_t (1 + g) \tag{20}$$

$$A_{i, t+1} = A_{i, t} (1+t_i) \tag{21}$$

$$K_{2, t+1} = K_{2, t} (1-d) + I_{2, t}. \tag{22}$$

It is assumed, in keeping with the Lewis model, that productive
capital accumulation occurs only in sector 2 and not in sector 1.

With a balanced budget, total income equals total output.
Saving and investment can therefore be shown as:

$$S = s_0 (y_1 + y_2) = I_2 + I_3. \tag{23}$$

Hence:

$$I_2 = s_0 (y_1 + y_2) - I_3. \tag{24}$$

Productive investment is diminished to the extent that non-productive
investment occurs. However, I_2 might depart from this value in
either direction:

$$I_2 = s_0 (y_1 + y_2) - I_3 + wF = s_0(y_1 + y_2) \tag{25}$$

$$I_2 = s_0 (y_1 + y_2) - I_3 - wC = s_0(y_1 + y_2) - I_3 - w_2L_3. \tag{26}$$

wF ($= I_3$) is additional forced saving: a Soviet-type government can
raise taxes without affecting productive investment, i.e., squeeze
private consumption to maintain productive investment as a proportion
of output. wC ($= w_2L_3$) is the additional consumption required to
maintain private consumption at its previous level in the face of
taxation yielding no consumption benefits. In this case, productive
investment is reduced by the full extent of taxation, equal to non-

productive expenditure. The same result would be obtained if the effect of the government budget was to transfer income from profit-recipients, with a marginal propensity to save of unity, to workers, with a marginal propensity of zero.

If people save only out of their income in excess of subsistence ($\pi = w_{10} = w_{20}$), we have equations (23')...(26') respectively, e.g.

$$S = s_1 (y_1 + y_2 - \pi L). \tag{23'}$$

Table 2 sets out plausible parameter values to be assumed in the model, and initial conditions in the base period. The Generalized Algebraic Modelling System (GAMS) was used to set up and solve the model.

5. Simulation Results

We present results for six different cases. The first, 'misallocation', involves a wage gap ($\delta = 1.5$) and the associated sectoral misallocation but no urban unemployment (m = 10,000) and no government employment response (g = 0, q = 0). In the second, 'Harris-Todaro', the wage gap is assumed to generate urban unemployment (m = 3). In the third and fourth, 'government response', government responds to urban unemployment by creating government employment (g > 0). The fifth and sixth cases, 'full government response', have government respond both by employing workers in the sink (g > 0) and providing them with capital (q > 0). The government response and full government response cases distinguish between 'weak

pressures' for employment (g = 0.5, q = 0.5) and 'strong pressures' (g = 0.9, q = 1.0).

The behavior of the economy over 13 'annual' periods is simulated in these six cases.[8] Tables 3 and 4 show the behavior of relevant variables in or between the base period (period 0) and the final period (period 13).

The misallocation case, corresponding in Figure 1 to wages w_{11} and w_{21} and employment OD and O'D in sectors 1 and 2 respectively, is taken to be the base run. It is chosen in preference to the competitive labor market case ($w_{10} = w_{20}$) because the object is to contrast the effects (stressed in the literature) of introducing Harris-Todaro unemployment into a distorted labor market with the effect of in addition introducing a government response function; to include the static and dynamic costs of labor misallocation without unemployment would blur the comparison. Given a net saving rate of 0.17, capital accumulates at 3.7 per cent. Since labor grows at 2.0 per cent there is capital deepening. This, together with technical progress at a rate of one per cent in the rural and two per cent in the urban sector, generates growth in output of 4.6 per cent and in

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[8]Since the parameter values for the assumed rates of change from one period to another correspond to typical annual rates of change in developing countries, results in the form of rates of change per period can be regarded as 'annual' rates of change.

output per worker of 2.5 per cent. The base run captures a number of the characteristics of a relatively successful developing economy.[9]

The Harris-Todaro case corresponds to wages w_{12} and w_{22}, employment OC, O'D and unemployment CD in Figure 1. Urban unemployment is 20 per cent of the urban labor force and, since the wage gap and migration damp factor are fixed, it remains there over the 13 years. Although rural employment and output fall, total output is only 2 per cent lower in period 0 in the Harris-Todaro case than in the misallocation case: the static effect of urban unemployment is small. Moreover, any dynamic effect is negligible: output per worker still grows at 2.5 per cent. The attention paid in the literature to migration-induced unemployment is out of proportion to the trifling social cost of such unemployment suggested by our simulations.

The case of government response can be depicted in Figure 1 as wages w_{13} and w_{23} and employment OE and O'D in sectors 1 and 2 respectively, employment BD in the sink and unemployment EB. The effects are qualitatively the same whether we consider 'strong' or 'weak' employment pressures, but they differ quantitatively. The

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[9]The assumption that capital accumulation takes place only in sector 2 is in the spirit of the Lewis model and draws support from empirical evidence for a number of developing countries: it is commonly claimed that capital intensity is higher in the urban modern sector than in the rural sector, and that there is a net transfer of saving from the latter to the former (for instance, Mellor and Johnston, 1984). Indeed, the capital stock of the rural sector might be interpreted as land. Rental rates on capital diverge in the model owing to the rapid growth of capital in sector 2: increasing land rents per acre are normal with economic growth. Employment growth occurs at the same rate (2.0 per cent) in both sectors.

former response function is not implausibly large; although government creates almost one sink job for every person unemployed, sink employment expressed as a proportion of the number of rent-seekers ($U + L_1$) is, by period 13, only 5.4 per cent when the pressures are strong, compared with 2.6 per cent when the pressures are weak. As a proportion of the urban labor force sink employment is 18 per cent and 10 per cent respectively.

Expenditure on sink employment crowds out productive investment. K_2 grows at 7.2 per cent in the misallocation case, and 7.1 percent in the Harris-Todaro case. When there are pressures for job creation, the rate of growth of K_2 drops to 6.3 per cent if they are weak and to 5.6 per cent if they are strong. The static effect on output (a fall of 3.4 per cent in period 0 when pressures are strong) is itself greater than in the Harris-Todaro case. More important, however, is the dynamic effect, retarding the growth of output each year by 0.5 per cent when the pressures are weak and by 0.9 per cent if they are strong.[10]

In the final case the diversion of capital into the sink has no effect on sink employment or urban unemployment but productive investment suffers further. In period 13 the sink accounts for 4.0 per cent of the total capital stock in the weak pressures case and

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[10] The Harris-Todaro case would produce dynamic effects analogous to the government response case (without investment response) if government provided an open-ended compensation scheme for the unemployed. In most developing countries government unemployment compensation schemes, if they exist at all, are weak and confined to those already in modern sector employment.

for 13.2 per cent in the strong pressures case; and for 12.8 and 42.9 per cent respectively of the increment to the total capital stock over the 13 periods.

The further loss of saving for productive investment reduces the annual rate of increase in K_2 to only 5.8 and 3.8 per cent respectively. Output per worker grows at only 1.6 per cent in the case of full government response with weak pressures and at 0.5 per cent with strong pressures. On this last scenario improvement in living standards is thus very largely eliminated. Moreover., the attempt to reduce unemployment is futile: the number of unemployed workers is substantially _higher_ than in the Harris-Todaro case.

Various sensitivity analyses were conducted; these generally confirmed that the results are robust. In particular, alternative saving assumptions were explored.[11] One sensitivity exercise is to replace saving equation (26) with its alternative formulation, (26'). Instead of assuming that income is saved at the rate $s_0 = 0.25$, we assume that income above a subsistence level (the initial competitive wage) is saved at $s_1 = 0.50$. The annual growth of output per worker remains effectively the same (2.6 per cent) in the base run, but the effect of introducing government response is greater. In the case

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[11]The choice of tax rates t_1 and t_2 affects the relative production and employment of sectors 1 and 2, but the basic result is little different.

of full government response with strong pressures the fall is to 0.2
per cent instead of to 0.5 per cent per annum.[12]

Introducing the intermediate saving equation (24), we find that
the annual growth of output per worker becomes 1.0 per cent in the
case of full government response with strong pressures. Thus the
reduction in growth (1.5 per cent) remains significant, being three-
quarters of the reduction in the case of (26). ·But the assumption
that saving occurs only out of income in excess of subsistence again
increases the sensitivity of the growth rate to the presence of a
sink: on saving assumption (24') as with (26), annual growth of
output per worker is reduced from 2.5 per cent to 0.5 per cent when
full government response with strong pressures is assumed.[13]

Only in the Soviet-type case -- equation (25) -- is economic
growth little affected by the government response. Here the annual
growth of output per worker falls from 2.5 only to 2.0 per cent. The
main effect is a reduction in the level of consumption in all
periods. For instance, in the final period consumption in the case
of full government response with strong pressures is 15 per cent
below its level in the misallocation case. The Soviet-type

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[12]Both in this case and in the cases reported below, the static
and dynamic effects of the sink are combined; in no case does the
static effect account for more than 0.3 percentage points of the fall
in growth of output per worker.

[13]A more sophisticated version of (24'), allowing saving
propensities out of subsistence income and additional income of 0.15
and 0.30 respectively and keeping the real subsistence level of
expenditure constant as the relative prices of products 1 and 2 vary,
produces a corresponding fall in annual growth of output per worker
from 2.2 to 0.5 per cent.

assumption is implausible for most developing countries, however,

implying as it does that governments have the power to increase

taxation simply by squeezing consumption.

6. Conclusions

Our modification of Lewis' model takes its cue from another

great development economist writing 178 years before him:

> Great nations are never impoverished by private, though they
> sometimes are by public prodigality and misconduct. The whole,
> or almost the whole public revenue, is in most countries
> employed in maintaining unproductive hands..... Such people, as
> they themselves produce nothing, are all maintained by the
> produce of the other mens' labor. When multiplied, therefore,
> to an unnecessary number, they may in a particular year consume
> so great a share of this produce, as not to leave a sufficiency
> for maintaining the productive laborers, who should reproduce it
> next year. The next year's produce, therefore, will be less
> than that of the foregoing, and if the same disorder should
> continue, that of the third year will be still less than that of
> the second.....(Smith, 1776, pp. 342).[14]

Our concern is not as broad as that of Smith (1776) and Bacon

and Eltis (1976), for whom the non-marketed sector as a whole was

unproductive. Governments in developing countries should, and do,

also provide valuable goods and services which generate a derived

demand for factors of production. But wasteful diversion of

resources into the public sector, over and above the derived demand

for resources, can result from rent-seeking and rent-creating

behaviour.

There is an important difference between the Smithian approach

and the now-conventional welfare theoretic approach to development.

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[14]Quoted in Bacon and Eltis (1978, p. v.

The latter views government as imperfect but well-meaning and
educable, as definitely part of the solution rather than as part of
the problem. Both approaches are simplistic; however, this paper
constitutes another nibble at the edges of the prevailing paradigm
and a building block for the more sophisticated theory of policy-
making in developing countries that should come to replace it.

We have shown that the accumulation, in little more than a
decade, of even a small proportion of the labor force in an
unproductive 'sink' can sap the economy of its dynamism, eliminating
improvements in living standards for all but the few who obtain rent-
yielding jobs. The dynamic cost of public sector surplus labor
appears to be much more important than the static social cost
normally attributed to urban unemployment in the context of
probabilistic migration models. Fiscal resources are needed to
support the sink and its investment claims, thereby diverting
resources from productive investment. Moreover, creating sheltered
employment encourages further rent-seeking, migration and
unemployment. The experiments conducted to examine the sensitivity
of the model to its various assumptions suggest that the main
conclusion is robust.

Instead of postulating a non-productive sector we could have
modelled government employment response as an expansion of modern
sector employment beyond the level at which the marginal product
equals the wage. Instead of having zero productivity, the additional
employees would then be used as productively as possible in the modern

sector. The model would be analytically equivalent to one
conventionally justifying an employment subsidy, but would differ
from it in the motivation for the policy intervention[15]. However,
this assumption is inconsistent with surplus labor being confined to
the public sector. Nor is it plausible that excess labor is allocated
among public enterprises according to the elasticity of the marginal
product of labor with respect to employment. Our zero marginal
product assumption does not necessarily define the other extreme. It
can represent an average of positive and negative marginal products
in the sink, or it may incorporate negative externalities, for
instance, morale effects on other public sector employees. The urge
to find tasks for sink employees can also induce rent-creating
regulation of the private sector.

The phenomenon of public sector surplus labor has been most
obvious under populist, highly interventionist leaders. It may be
more insidious in a milder form, however, because its effects, which
may take several years to become visible, are less attributable; it
is less likely, therefore, to be corrected. But recognition of the
ill-effects of surplus labor may not be sufficient to reverse
policies. Hysteresis applies: the government's response itself
creates or consolidates vested interests which seek to perpetuate it.
Economists search for explanations of why some developing countries
have succeeded in growing rapidly while some others, equally well

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[15] More generally, the technical relationships analysed in this
paper stem from the literature on shadow pricing, of which Sen (1960)
is a pioneering and Anand and Joshi (1979) a recent example.

-endowed and with similar rates of saving, have failed. One strong

focus has been on foreign trade regimes; the Lewis model, when

viewed through a looking glass, is suggestive of another explanation

for failure.

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Table 1 -- Selected Developing Countries: Growth of Wage Employment in the Public and
            Private Sectors

Country	Period	Average Growth (per cent per annum)			Percentage share of public sector in increase of total wage employment
		Public	Private	Total	
Brazil	1973-83	1.4	0.0	0.3	92
Costa Rica	1973-83	7.6	2.8	3.5	34
Egypt	196E-76	2.5	-0.5	2.2	103
Ghana	1960-78	3.4	-5.9	-0.6	-
India	1960-80	4.2	2.1	3.2	71
Kenya	1963-81	6.4	2.0	3.7	67
Panama	1963-82	7.5	1.8	2.7	45
Peru	1970-84	6.1	-0.6	1.1	140
Sri Lanka	1971-83	8.0	0.9	3.9	87
Tanzania	1962-76	6.1	-3.8	1.6	190
Thailand	1963-83	6.3	5.5	5.7	33
Trinidad	1970-84	4.7	1.2	1.9	51
Venezuela	1967-82	5.1	3.4	3.7	27
Zambia	1966-80	7.2	-6.2	0.9	418
Unweighted mean		5.5	0.3	2.4	

Sources:

Brazil: Brazilian Economic Studies, No. 5, Rais 83; (urban wage employment).
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Table 2 -- Parameter Values, Initial Values and Experimental
Parameter Values

<u>Parameter Values (invariant)</u>

Factor shares	$\alpha_1 = 0.5$, $\alpha_2 = 0.5$
Depreciation rate	$d = 0.08$
Price of sector 2 output (numeraire)	$p_2 = 1$
Technical progress rate	$\tau_1 = 0.01$, τ_2, = 0.02
Labor force growth rate	$\lambda = 0.02$

<u>Initial Values (base period)[1]</u>

Labour supply	$L = 75$
Capital stock	$K_1 = 333$, $K_2 = 167$, $K_3 = 0$
Employment	$L_1 = 50$, $L_2 = 25$
Output	$Y_1 = 100$, $Y_2 = 50$
Wage	$w_1 = 1.0$, $w_2 = 1.0$
Price of sector 1 output	$p_1 = 1$
Rental on capital	$r_1 = 0.15$, $r_2 = 0.15$

<u>Experimental Parameter Values</u>

Wage gap	$\delta = 0$, 1.5
Migration damp factor	$m = 0$, 3, 10,000
Government response parameter	$g = 0$, 0.5, 0.9
Government capital damp factor	$q = 0$, 0.5, 1.0
Saving rates	$s_0 = 0$, 0.25
	$s_1 = 0.5$, 0
Tax rates	$t_1 = 0$, $t_1 > 0$
	$t_2 > 0$, $t_2 = 0$
	$t_1 = t_2 > 0$

---

[1]These initial values relate to the first period, when $\delta = 0$, whereas
the calibration of the model required that changes be introduced only
in the third period. This third period is referred to in the text
and subsequent tables as the base period, period 0.

Table 3 -- Simulation Results: Employment, Unemployment, Labor Force, Capital and Rental Rates, Base and Final Periods

| | Misallocation | | Harris-Todaro | | Weak Pressures | | | | Strong Pressures | | | |
| | | | | | Government Response | | Full Government Response | | Government Response | | Full Government Response | |
	0	13	0	13	0	13	0	13	0	13	0	13
Employment and labor force												
Rural sector employment (L_1)	65.0	84.1	62.4	80.8	60.7	78.5	60.7	78.5	60.7	76.3	60.7	76.3
Urban sector employment (L_2)	13.0	16.8	12.5	16.2	12.1	15.7	12.1	15.7	12.1	15.3	12.1	15.3
Sink employment (L_3)	0	0	0	0	1.7	2.2	1.7	2.2	1.7	4.4	1.7	4.4
Unemployment (U)	0	0	3.1	4.0	3.5	4.5	3.5	4.5	3.5	4.9	3.5	4.9
Labor force ($L = L_1 + L_2 + L_3 + U$)	78.0	100.9	78.0	100.9	78.0	100.9	78.0	100.9	78.0	100.9	78.0	100.9
Urban labor force ($= U + L_2$) $+ L_3$	13.0	16.8	15.6	20.2	17.3	22.4	17.3	22.4	17.3	24.7	17.3	24.7
Rent-seekers ($= U + L_1$)	65.0	84.1	65.5	84.8	64.2	83.0	64.2	83.0	64.2	81.2	64.2	81.2
Unemployment as percentage of:												
Labor force	0	0	4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.9	4.5	4.9
Urban labor force	0	0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Employment in sink as percentage of:												
Labor force	0	0	0	0	2.2	2.2	2.2	2.2	2.2	4.4	2.2	4.4
Urban labor force	0	0	0	0	10.0	10.0	10.0	10.0	10.0	18.0	10.0	18.0
Unemployment	0	0	0	0	50.0	50.0	50.0	50.0	50.0	90.0	50.0	90.0
Rent-seekers	0	0	0	0	2.7	2.7	2.7	2.7	2.7	5.5	2.7	5.5
Capital stock:												
Rural sector (K_1)	333	333	333	333	333	333	333	333	333	333	333	333
Urban sector (K_2)	225	558	225	548	225	500	225	468	225	459	225	367
Sink (K_3)	0	0	0	0	0	0	16	33	0	0	16	107
Total	558	891	558	881	558	833	574	835	558	792	558	807
Capital stock in sink as percentage of:												
Total capital stock	0	0	0	0	0	0	2.8	4.0	0	0	2.9	13.2
Increment to total capital stock	0	0	0	0	0	0	-	12.8	0	0	-	42.9
Rental rates on capital as percentage:												
Rural sector	12.6	22.5	12.3	21.9	11.9	20.1	10.6	19.2	11.9	18.5	10.6	15.8
Urban modern sector	9.3	6.7	9.1	6.7	8.8	6.7	7.8	6.8	8.8	6.7	7.8	7.2

Notes:
[1] The GAMS algorithm was run for 16 periods but model calibration required that the various effects be introduced in the third period, referred in the table as period 0.

[2] "Weak pressures" are defined as g = 0.5 in the case of 'Government response' and g = 0.5, q = 0.5 in the case of "Full government response". "Strong pressures" are defined as g = 0.9 in the case of "Government response" and q = 0.9, q = 1.0 in the case of "Full government response".

[3] The productive investment equation corresponds to equation (26) with $s_0 = 0.25$. The taxation equation corresponds to (13) with $t_1 > 0$, $t_2 > 0$, i.e. taxes are levied on both rural and urban production at the same percentage rate ($t_1 = t_2$).

Table 4 -- Simulation Results: Growth of Output and Output Per Worker

| | Misallocation | Harris-Todaro | Weak Pressures | | Strong Pressures | |
			Government Response	Full Government Response	Government Response	Full Government Response
Output						
Period 0	125.7	123.2	121.4	121.4	121.4	121.4
Period 13	225.0	218.5	205.8	199.2	194.4	173.9
Period 13 (period 0 = 100)	179.0	177.4	169.5	164.1	160.1	143.2
Static percentage change (in period 0)	0	-2.0 ·	-3.4	-3.4	-3.4	-3.4
Average percentage increase per period:						
Dynamic effect only	4.6	4.5	4.1	3.9	3.7	2.8
Static plus dynamic effects	4.6	4.3	3.9	3.6	3.4	2.5
Output per worker						
Static percentage change (in period 0)	0	-2.0	-3.4	-3.4	-3.4	-3.4
Average percentage increase per period:						
Dynamic effect only	2.5	2.5	2.1	1.8	1.7	0.8
Static plus dynamic effects	2.5	2.3	1.8	1.6	1.4	0.5

Notes:
[1] The GAMS algorithm was run for 16 periods but mode calibration required that the various effects be introduced in the third period, referred in the table as period 0.

[2] "Weak pressures" are defined as $g = 0.5$ in the case of 'Government response' and $g = 0.5$, $q = 0.5$ in the case of "Full government response". "Strong pressures" are defined as $g = 0.9$ in the case of "Government response" and $q = 0.9$, $q = 1.0$ in the case of "Full government response".

[3] The productive investment equation corresponds to equation (26) with $s_0 = 0.25$. The taxation equation corresponds to (13) with $t_1 > 0$, $t_2 > 0$, i.e. taxes are levied on both rural and urban production at the same percentage rate ($t_1 = t_2$).
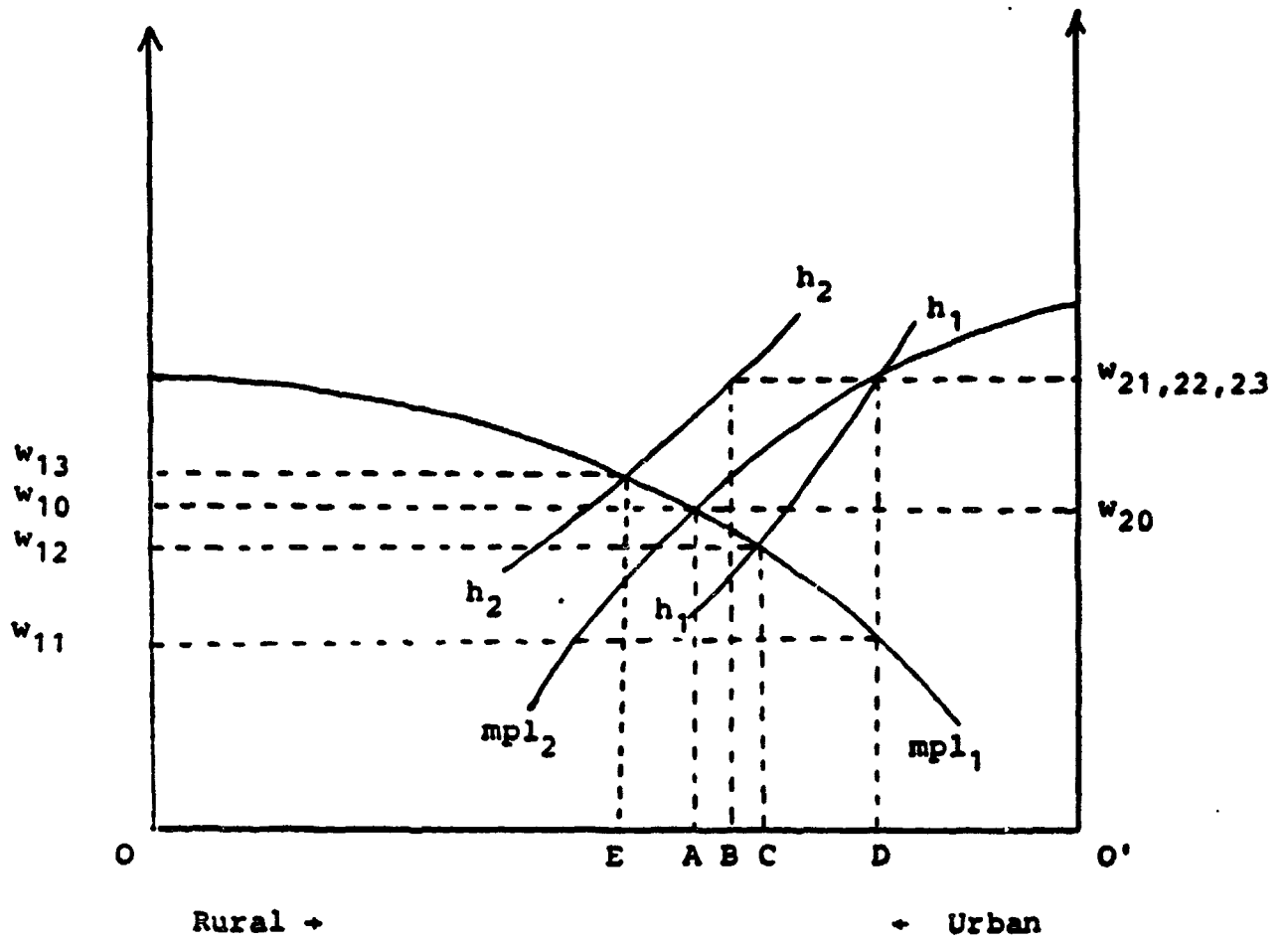
Figure 1.

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