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The World Bank Research Observer
Editor, Room S-13-131
The World Bank
1818 H Street, N.W.
Washington, D.C. 20433, U.S.A.

The World Bank Research Observer is available on subscription at $20 a year for readers with mailing addresses in countries that are members of the Organisation for Economic Co-operation and Development. Readers with addresses in non-OECD countries are eligible to receive complimentary subscriptions on request.

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Manufactured in the United States of America
ISSN 0257-3032

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VOLUME 3 NUMBER 1 JANUARY 1988

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Correction

Some parts of a sentence were inadvertently dropped from the article "Land Rights Systems and Agricultural Development in Sub-Saharan Africa" by Feder and Noronha, which appeared in the July 1987 issue of the *Observer*. The statement referring to Tanzania in the first paragraph of p. 150 should read:

> In Tanzania, after attempts to reintroduce the golden era of communal tenure, the government then began experimenting with long-term leases to individual farmers (for thirty years, which could be extended to ninety-nine years).

We regret any inconvenience this may have caused.

GOVERNMENT WAGE POLICY IN AFRICA
Some Findings and Policy Issues

David L. Lindauer
Oey Astra Meesook
Parita Suebsaeng

By the late 1970s and early 1980s two problems related to government wage and employment policies had become acute in many African countries: the government's fiscal performance and its ability to provide real goods and services to the population. Considerable research and policy dialogue have been devoted to the problem of growing government expenditures in the face of declining public resources, and less to the real performance of the government, in particular the role played by its own pay and employment policies.

The government's fiscal and real performances are not independent. Under growing macroeconomic constraints, the size of the government and the level of wages and salaries of public workers have come under scrutiny as factors contributing to the overall problem of containing government budgets. Indeed, freezes or ceilings on government employment and wages have frequently figured in discussions between countries and the International Monetary Fund in the context of stand-by arrangements. Such agreements, often targeted at the aggregate level of government wage expenditures, have rarely considered the microeconomic implications of government wage and employment decisions on the actual provision of public goods and services.

In the meantime, African governments have become increasingly unable to finance and manage the public sector. Visible signs include declining morale and work effort on the part of government workers, problems in staffing large numbers of skilled positions, paucity of complementary inputs in producing government services, and increas-

Table 1. *Growth of Public Employment in Selected African Countries, 1970–83*

Country and coverage	Public sector as % of formal sector wage employment, 1981	Number of public employees 1970	1975	1980	1983	Annual growth rate, 1975–83 (percent)
Ghana						
Civil service[a]	—	—	75,000 [100]	—	200,000[b] [267]	15.0[c]
Liberia						
Government public service	16[b]	—	—	—	33,600[b]	—
Public corporations	5[b]	—	—	—	10,000[b]	—
Malawi						
Civil service established posts	—	—	31,840[d] [100]	39,824 [125]	50,368 [158]	7.9[e]
Mali						
Civil service[f]	33[g]	26,637 [84]	31,783 [100]	45,733 [144]	49,116 [155]	5.6
Fonctionnaires	21	13,425	18,078	30,598	35,193	8.7
Conventionnaires	10	13,212	13,705	15,135	13,923	0.2
Municipal and district employees	1	—	—	950	—	—
Parastatals[h]	32[g]	—	—	45,401	—	—
Nigeria						
Federal civil service employees[i]	43[j]	89,813[k] [62]	144,817[l] [100]	231,802 [160]	279,665 [193]	8.6
State and local governments	—	—	338,524[m]	—	822,113	15.9[e]
Parastatals[n]	22	—	256,014[m]	—	621,741	15.9[e]
Total public sector	—	—	716,421[m] [100]	—	1,723,519 [241]	15.8[e]
Senegal						
Civil service and noncommercial public enterprises	45[g]	61,836 [86]	71,742[o] [100]	88,390 [123]	—	5.4[p]
Sudan						
Budgeted positions for classified employees in central and regional governments[q]	—	—	131,612[r] [100]	135,891[s] [103]	161,893[t] [123]	2.6 [123]
Budgeted positions for unclassified employees in central and regional governments	—	—	—	—	173,866[s]	—

Zambia						
Zambian employees in central and local governments (including classified daily employees)	37[g]	127,170[u]	124,760 [100]	135,750 [109]	131,646 [106]	0.7
Parastatals	38[g]	—	116,090 [100]	136,420 [118]	—	3.3[v]

—Not available.

Note: Figures in square brackets are index values.

a. Excludes educational service, police, and military. b. Data are for 1982. c. Data are for 1975–82.

d. Data are for 1977–78, when nearly 10,000 teachers were brought under the civil service established list for the first time. Thus comparable figures are not available for earlier years.

e. Data are for 1977–83.

f. Data include both fonctionnaires who are governed by civil service regulations and conventionnaires who are governed by a collective agreement. Municipal and district employees are not included.

g. Data are for 1980.

h. Data include employees of companies under the Ministère de Tutelle des Sociétés d'Etat, employees working for the Operations de Developpement Agricoles, and employees working for other public and parapublic agencies.

i. Data include both established and nonestablished staff. Established staff includes both permanent and temporary employees.

j. Public sector here includes federal civil service and state and local governments; however, data on trends in employment are available for the federal civil service only.

k. Data are for 1971. l. Excludes Ministries of Information, Mines, and Power. m. Data are for 1977.

n. Data include federal and state corporations. o. Data are for 1976. p. Data are for 1976–80.

q. Public sector includes classified and unclassified employees of the government; however, data on trends in employment are available for classified employees only. Although the number of unclassified workers is significant, data to show trends in their employment are not available. (In 1983 unclassified workers accounted for 52 percent of total budgeted positions. In 1977–78 a number of unclassified employees were transferred to the classified category.)

r. Data are for 1975–76. s. Data are for 1979–80. t. Data are for 1983–84.

u. Data include parastatal employment. v. Data are for 1975–80.

Source: Ghana: Data from the Office of the Civil Service, Central Bureau of Statistics, as reported in Fox 1985, table 2. 1975 data are from the Report of the Commission of Inquiry, Civil Service Structure, and Procedures. *Liberia:* Ministry of Planning and Economic Affairs, as reported in Khan 1983. *Malawi:* Government of Malawi, *Estimates of Expenditure on Revenue Account for the Financial Year 1983/84 as Laid Before Parliament on 18th March, 1983,* Budget Document 1 and earlier volumes. *Mali:* 1970, 1975, and 1980 data based on Commission Nationale de la Reforme Administrative, *Review of Trends in Civil Service Staff, 1975–80.* 1983 data based on Direction Nationale du Travail et des Lois Sociales, Office Nationale de la Main d'Oeuvre, *National Conference on Employment—Employment Policy in Mali,* (Bilan Economique et Financier de la Republique du Mali, 1981). These are reported in Lardeau and others 1985, tables A-1 and B-1. *Nigeria:* Federal Civil Service Manpower Statistics, 1976, 1979, and 1981 (table 1.4). Reference date is September 30 until 1977 and December 31 thereafter. National Manpower Board, Federal Ministry of National Planning, *Study of Nigeria's Manpower Requirements, 1981* (Lagos, June 1983). *Senegal:* Direction de la Statistique, *Situation Economique 1959–1979,* as reported in Bloch 1985, table 1. *Sudan:* Data provided by the Civil Service Department, as reported in Lindauer and Meesook 1984b. *Zambia:* Central Statistical Office, Lusaka. 1970 data from *Report on Employment and Earnings,* 1969–71, tables 3.1 and 3.2. 1975 data from *Monthly Digest of Statistics,* January–March 1980 supplement, tables 2, 3, and 4. 1980 data from *Report on Employment and Earnings,* 1980, table 3.0; *Employment and Earnings Survey,* tables 1, 2, and 3 for the quarter ending December 1980; *Monthly Digest of Statistics,* April–September 1983 supplement. 1983 data are from the unpublished Manpower Survey, 1983.

ing imbalance between the demand for government services and the provision of public goods.

For a number of reasons the longer-term issues of pay and employment practices and the government's real performance have not received as much attention as the shorter-term issues of fiscal management. The macroeconomic imbalance in many African economies, brought on by adverse changes in the external terms of trade, misguided economic policies, political instability, and other factors, has indeed created a fiscal crisis. A contributing factor has been the conventional wisdom among external advisers that African governments are "too big" and wages are "too high," in part because of excessive government pay levels which set wage standards throughout the modern sector. According to this view, African countries inherited high-wage economies from the colonial period, and both the level and structure of real wages have remained out of line ever since. For example, the following views were expressed in 1981: African wages are high compared with those of Asia . . . Higher African wages reflect . . . government wage policy, which in many countries sets industrial wages above the level they would otherwise be.[1] With this view of the African situation, it is not surprising that policy advice has constantly called for a reduction in pay levels.

Whatever the merits of the conventional wisdom, the lack of evidence substantiating it is disturbing. A primary objective of this article is, therefore, to assess the conventional wisdom by documenting recent trends in government wages and employment.[2] This task is complicated by the scarcity of data on wages and employment in African countries, particularly information disaggregated according to skill level and sector. The evidence presented here documents the significant real wage adjustments experienced by most government workers in the countries in our sample. A second objective is to provide a more microeconomic focus on the relation between government pay and employment policies and on the real consequences of such policies on government performance. This focus may suggest some useful directions for policy reform.

Findings

In our sample of African countries, public employment (including parastatal companies) accounts for between one-fifth and four-fifths of wage employment in the formal sector (see table 1).[3] African wage employees are typically only a small fraction of the working-age population, but the dominance of the public sector in the formal economy implies that most wages will be influenced by government pay and employment decisions.[4] This is in contrast to advanced market economies where government pay and employment policies are often thought to be constrained by wage levels prevailing in the private sector.[5]

Government wage and employment experiences and policies differ considerably among African countries. Table 2 presents evidence on relative government wage and employment levels across our sample. Note that some variance in relative wage and employment structures is not conclusive proof of different policy approaches; it could also reflect underlying economic conditions. The extent of variation, however, suggests that policy differences are likely to be significant. For example, salary differentials between senior government officials and unskilled civil servants (column 2) are roughly 25:1 in Malawi, but only 7:1 in Zambia. And unskilled government workers in Liberia earn more than four times the per capita income, while in Sudan similar workers receive only three-fifths of per capita income (column 4). The crude data on government employment per capita (columns 5 and 6) also suggest differences in the relative size of government between countries with similar levels of per capita income.

Since significant differences in government pay and employment policies exist across African economies, sensitivity to specific national circumstances should be a prerequisite for policy formulation. However, enough basic similarities characterize recent government wage and employment trends to suggest common areas of needed policy reform. We document these trends here, paying attention to movements in real government wages, the evolution of the government pay structure, the role of fringe benefits in total compensation, and government wages and employment in relation to the government wage bill.

Wage Levels

The economic difficulties of most African countries have been associated with a general decline in real incomes. The public sector has not been spared. In every country in our sample and for virtually all levels of civil servants, basic starting salaries have declined in real terms from the early or mid-1970s to around 1983 (see table 3)—often by significantly more than the average fall in real per capita income. The most extreme cases are in Uganda and Ghana, where real basic starting salaries had virtually disappeared by 1983 compared with 1976, and in Sudan, where by 1983 real basic starting salaries had fallen to around one-third of their 1975 level and one-fifth of their 1970 level.

Without implying that the earlier salary levels of any country were in any way correct, it is worth emphasizing that, with few exceptions, significant adjustments in real government salaries have taken place in response to economic downturns. In Sudan real wages fell 11–15 percent annually between 1975 and 1983. In Uganda they fell by one-fifth to one-third each year over this period. Far from being rigid, real

Table 2. *Government Pay and Employment Policy Outcomes in Selected African Countries, 1980–84*

Country	GNP per capita, 1983 (U.S. dollars) (1)	Government salary structure[a] S^{Sr}/S^{Unsk} (2)	S^{Univ}/S^{Unsk} (3)	S^{Unsk}/GNP per capita (4)	Government employment per 1,000 inhabitants: Established posts[b] (5)	Total budgeted positions[c] (6)
Liberia	480	—	2.8[d]	4.2[d]	19.1[e]	19.8[e]
Malawi	210	24.9[f]	9.2[f]	1.2[g]	6.8[d]	—
Nigeria	770	9.2[g]	2.6[g]	2.6[g]	10.8[e]	—
Senegal	440	—	3.1[h]	2.4[g]	7.0[f]	9.5[f]
Sierra Leone	330	11.3[h]	—	1.8[h]	—	—
Sudan	400	9.3[f]	2.6[f]	0.6[d]	7.8[d]	13.6[d]
Zambia	580	6.9[d]	2.7[d]	2.0[d]	13.2[d]	21.2[d]

a. Government salary structure is defined as follows: S^{Sr}/S^{Unsk} is the ratio of starting basic salaries of senior government officials to the starting basic salaries of the lowest-paid regular government employees. Given different bureaucratic organizational forms, these occupational categories are not identical across countries, although an attempt was made to keep categories as uniform as was possible. Senior officials referred to the following: Malawi—undersecretary; Nigeria—permanent secretary; Sierra Leone—deputy secretary; Sudan—deputy undersecretary; Zambia—undersecretary. Unskilled categories referred to the lowest-paid regular government employee, usually a messenger. S^{Univ}/S^{Unsk} is the ratio of starting basic salaries of university graduates to the starting basic salaries of the lowest-paid regular government employees. For Malawi, Nigeria, Sudan, and Zambia the entry position for university graduates refers to administrative positions; for Liberia it refers to starting salaries for those with a bachelor's degree in education; for Senegal it refers to the lowest salary a university graduate receives upon entering government service.

b. Unless otherwise noted, data refer to budgeted posts for regular civilian employees. Note that this is a crude index of actual employment since budgeted positions often remain unfilled. For Liberia, Nigeria, and Senegal, however, the numbers refer to actual, not budgeted, positions. In Nigeria employment includes all levels of government.

c. Data differ from those for established posts in that nonregular, usually casual, employees are also included. Casual employees are included as full-time equivalents. For Liberia and Senegal data refer to actual employment; for other countries they refer to budgeted positions. In Sudan the distinction between established posts and total budgeted positions is more complex, involving distinct treatment of casual labor and of regional as opposed to central government employees. (See Lindauer and Meesook 1984b for details.)

d. Data are for 1983.

e. Data are for 1981.

f. Data are for 1984.

g. Data are for 1982.

h. Data are for 1980.

Source: GNP per capita: World Development Report 1985, table 1. In order to compute the ratio in column 4, GNP per capita figures expressed in U.S. dollars were converted to local currencies using the annual average official market rate as reported in *International Financial Statistics,* various years. *Population: World Development Report,* various years. *Government salary and employment data:* for Sierra Leone, Sierra Leone Government, *Estimates of Revenue and Expenditure,* 1979–80; for all other countries, see tables 1 and 3.

salaries have been eroded by inflation in the face of infrequent salary adjustments that have not kept up with price increases. Large nominal increases were granted to Ugandan civil servants in 1981: 30 percent, 50 percent, and 300 percent more than the 1976 levels for department heads, university graduates, and group employees, respectively. These increases were made meaningless, however, by a seventeenfold increase in prices.

A direct comparison between the trends in real wages of workers in the government and private sectors is not possible because data that control for the different skill compositions of the two sectors are unavailable. Instead, a simple comparison is made between the growth rates of real per capita GDP and real government starting salaries (see last two columns of table 3). In many countries government workers have borne a larger than average share of the adjustment to deteriorating macroeconomic conditions.

It could be argued that basic starting salaries are a poor index of total compensation for government workers since the time path of total compensation would look different if official, as well as unofficial, perquisites are added to basic earnings. There are a number of responses to this argument.

Even with a more complete accounting of official total compensation, including basic wages and fringe benefits, the results of declining real salaries seem to be robust with respect to a number of adjustments that can be made to basic starting salaries. The major fringe benefit, housing (which can be in the form of actual housing or a housing allowance) helps to cushion part, but not all, of the decline in real salaries. If, as is often assumed, households spend about 25–35 percent of their income on housing, then, for those who receive housing, 65–75 percent of total compensation is still subject to being eroded by rising consumer prices. In the face of the price inflations experienced in our sample of countries, housing benefits may only marginally slow the trend in declining real pay of government officials. Furthermore, many government workers, although nominally entitled to government housing, receive no housing benefit at all and are thus exposed to the full brunt of escalating urban prices.

Other official benefits—for example, transport, health, and family allowances—are all difficult to quantify. Impressionistic evidence suggests that they do not cover the majority of government workers, are usually small relative to basic wages, and have generally not been increased in response to falling real wages. There is little evidence that nonwage benefits have significantly altered the trends in real pay reported here.

As for unofficial perquisites of office, there is no denying that some government jobs provide access to scarce commodities, valuable contacts, and the opportunity for illicit incomes through bribes and kick-

Table 3. *Trends in Real Basic Starting Salaries in the Public Sector in Selected African Countries, 1975–83*

(1975 = 100)

Country and grade	*1970*	*1975*	*1980*	*1983*	*Annual growth, 1975–83 (percent)*	
					Salary	*Real GDP per capita*
Ghana						−4.8
2—Principal secretary/chief/director/deputy engineer in chief	—	100[a]	41.4	11.0	−30.8[b]	
5—Officer/administrative III/senior works superintendent	—	100[a]	49.5	15.3	−26.9[b]	
10—Messenger/watchman/laborer	—	100[a]	94.8	39.7	−14.3[b]	
Malawi						1.2
S_5—Undersecretary	—	100	84.0	64.5	−5.3	
A_3—University graduate	—	100	96.2	73.9	−3.7	
D_6—Messenger	—	100	92.2	85.2	−2.0	
Nigeria						−2.1
17—Permanent secretary	85.9[c]	100	47.0	30.1	−13.9	
8—University graduate	82.1[c]	100	50.1	38.1	−11.4	
1—Unskilled laborer	69.2[c]	100	76.5	63.8	−5.5	
Senegal						−2.6
A—With university degree	—	100[d]	106.5[e]	73.8[f]	−3.7[g]	
B—With secondary school diploma	—	100[d]	114.3[e]	84.7[f]	−2.1[g]	
E—No diploma	—	100[d]	128.5[e]	112.7[f]	1.5[g]	
Sierra Leone						0.2
Deputy secretary	122.0	100	62.2	—	−9.1[h]	
Technical officer	119.0	100	70.2	—	−6.8[h]	
Messenger	111.1	100	103.3	—	0.7[h]	
Sudan						−5.2[i]
4—Deputy undersecretary	151.8	100	59.6	28.7	−14.4	
9—University graduate	177.7	100	64.9	31.2	−13.5	
14—Secondary school graduate	167.1	100	66.5	32.0	−13.3	
18—Unskilled worker	153.3	100	72.7	35.0	−12.3	
Uganda						−3.2
U1—Permanent secretary/undersecretary	—	100[d]	7.7[e]	5.0[j]	−34.8[k]	
U5—Entering university graduate	—	100[d]	9.1[e]	5.9[j]	−33.3[k]	
Group employee	—	100[d]	23.7[e]	15.4[j]	−23.5[k]	

Zambia						−2.4
S3—Undersecretary	131.6[l]	100	68.2	44.9	−9.5	
S12—Entering university graduate	105.7[l]	100	63.0	40.9	−10.6	
S21—Lowest salaried employee	98.5[l]	100	88.7	83.0	−2.3	
Laborer	95.8[l]	100	85.2	87.7	−1.6	

— Not available.

a. Data are for 1977.
b. Data are for 1977–83.
c. Data are for 1972.
d. Data are for 1976.
e. Data are for 1981.
f. Data are for 1984.
g. Data are for 1976–84.
h. Data are for 1975–80.
i. Data are for 1975–82.
j. Data are for August 1983.
k. Data are for 1976–83.
l. Data are for 1971.

Source: Real basic starting salaries: Ghana: Office of the Civil Service, Central Bureau of Statistics. Basic starting salaries are deflated by the consumer price index (CPI) for Accra City. *Malawi:* Official salary scales of the government of Malawi. Starting salaries are deflated by the low-income CPI for Blantyre, excluding rent, as reported in the International Monetary Fund, *International Financial Statistics,* 37, no. 3 (March 1984). For 1983, the deflator refers to November 1983 and is not the annual average as it is for all other years. *Nigeria:* 1972, 1975, and 1979: O. Fajana and A. Aderinto, *Factors Affecting Public Sector Salaries Policy in an Open Economy: Nigeria* (Ottawa: International Development Research Center, 1981), tables 2.4 and 2.5. 1981 and 1982: Preliminary table on trends of pay in civil service since Udoji from Public Service Pay Research Unit, Establishments Department, Office of the Head of the Civil Service of the Federation. Figures for 1979 and 1981 are the same; these are assumed to be the 1980 figures. Figures for 1982 remained unchanged through 1984. Nominal starting salaries are deflated by (a) CPI for Lagos (1965–77) and (b) CPI for all urban areas (1975–83). These are two distinct CPI series which cannot be linked. The latter series is also available separately for low-, middle-, and high-income groups. Because the consumer price trends for these groups are not very different, the all-urban CPI is used. Consumer price indexes are from *Annual Abstract of Statistics,* 1975, table 10.7 (Lagos series), *Digest of Statistics* (June 1981), table 6.2, and *The Consumer Price Index Report,* April–June 1982, table 2 (all-urban series). *Senegal:* Figures refer to average pay for the hierarchy, not starting salary. Data for 1976 are from Ministere du Plan et de la Cooperation, Division des Ressources Humaines, "L'emploi dans le ecteur Public: Evolution et perspectives," 1978; data for 1981 and 1984 are from *Direction de Traitement Automatique de l'Information,* the Ministry of Finance computer enter, as reported in Bloch 1985, table 8. Nominal figures are deflated by CPI-A, the African Consumer Price Index, Direction de la Statistique, *Situation Economique,* Ministere des Finances. *Sierra Leone:* Salary scale for civil servants is from *Estimates of Revenue and Expenditures.* Nominal salaries are deflated by Freetown CPI. *Sudan:* Salary scales provided by the Civil Service Department. All figures refer to June. Higher-Salaries Consumer Price Indices for 1970–83 and preliminary figures for June, November, and December 1983 are provided by the Department of Statistics. *Uganda:* Basic starting salaries for 1976 and 1981 are taken from appendix 1, "The Revised Salaries in Shillings per Annum—Effective on 1st July, 1981," attached to memorandum EC 9442, *Amendments to Circular Standing Instruction No. 2 of 1976—Increases in Salaries/Wages,* from the Permanent Secretary of the Ministry of Public Service and Cabinet Affairs. Between 1981 and 1983, salary scales remained unchanged. Nominal salaries are deflated by the Kampala cost-of-living index (low-income group), Statistics Department, Ministry of Planning and Economic Development. *Zambia:* 1971: "Report of the Commission Appointed to Review Salaries, Salary Structures and Conditions of Service of the Zambian Public Service and the Defense Force," Government Paper 1, May 1971, appendix A and conversion table 48 of the main report. 1975:"Summary of the Main Recommendations of the Commission of Inquiry into the Salaries, Salary Structures and Conditions of Service, Together with the Party and Government Reactions to the Recommendations," Government Paper 1, 1975, appendixes B and C. 1980: "Summary of the Main Recommendations of the Administrative Committee of Inquiry into the Salaries, Salary Structures and Conditions of Service, Together with the Party and its Government's Reactions to the Recommendations," Government Paper 3, 1980, appendixes B and K. Also reported in Personnel Circular B9, Personnel Division, appendixes B and D. 1983: Personnel Circular B3 of 1984, Personnel Division, appendixes B1 and B3. Figures refer to November 1983. S3 salaries are deflated by high-income urban CPI, the others by low-income urban CPI. In 1975, low-income included households with gross monthly incomes less than K100, and high-income included households with gross monthly incomes of K300 or more. CPI data are from *Monthly Digest of Statistics,* May 1973, September 1974, January–February 1976, November–December 1977, and July–September 1982; and *Consumer Price Statistics,* May 1982, April 1984, and July 1984.

Real GDP per capita: International Monetary Fund, *International Financial Statistics,* various years. GDP in constant prices divided by midyear estimates of population.

backs. Measuring these forms of income is clearly beyond the scope of this (and probably any) study. However, it should be emphasized that most civil servants—teachers, health workers, typists, secretaries, and messengers—are not likely to be in a position to take advantage of such income sources. For those officials who can gain financially from the abuse of their offices, it is difficult to determine how far declining real salaries may be a contributing cause to any increases in illicit gains.

Determining trends in total compensation is obviously difficult, but in the case of Zambia it has been possible to estimate other components of remuneration besides basic wages. The addition of housing benefits does not significantly alter the trend suggested by real basic salaries (see table 4). Similarly, adjustments for income taxes, while in

Table 4. ***Trends in Real Basic Starting Salaries for Government Workers after Various Adjustments, Zambia, 1975–83***
(1975=100)

Type of adjustment and grade	*1975*	*1980*	*1983*
Basic starting salary			
S3—Undersecretary	100	68	45
S12—Entering university graduate	100	63	41
S21—Lowest-paid salaried employee	100	89	83
Basic starting salary plus value of imputed rent			
S3—Undersecretary	100	75	56
S12—Entering university graduate	100	73	59
S21—Lowest-paid salaried employee	100	96	92
Basic starting salary plus housing allowance			
S3—Undersecretary	100	70	46
S12—Entering university graduate	100	66	42
S21—Lowest-paid salaried employee	100	96	82
Net-of-tax basic starting salary—single individual			
S3—Undersecretary	100	62	47
S12—Entering university graduate	100	62	41
S21—Lowest-paid salaried employee	100	87	81
Net-of-tax basic starting salary—married individual with four children			
S3—Undersecretary	100	63	47
S12—Entering university graduate	100	63	42
S21—Lowest-paid salaried employee	100	89	83
Basic salary allowing for annual progression and salary awards			
S3—Undersecretary	100	92	69
S12—Entering university graduate	100	77	54
S21—Lowest-paid salaried employee	100	105	98

Source: Meesook and others 1986, table 4.2.

the expected direction, are of little significance. Finally, when allowances are made for progression of Zambian civil servants up the salary scale, it is still the case that real salaries have fallen considerably for all but the lowest-paid government workers.

For our sample as a whole, official nonwage benefits do not appear to have grown in response to declining real salaries. If anything, many of them, including the provision of housing and petroleum, have decreased since the mid-1970s, owing to increasingly severe fiscal constraints. Thus we conclude that real starting salaries can be considered a robust indicator of the real compensation of government workers over time.

It must be noted that declines in real wages have not been confined to civil servants; similar results are obtained for parastatal and private company employees.[6] Government workers, however, appear to have fared less well than other workers in the formal sector. These results are particularly important when assessing the relative attractiveness of government jobs and the impact of relative wages among different employers in allocating labor throughout the wage economy.

Wage Structure

Some African governments have pursued pay policies that favor lower-skilled workers, who have therefore experienced a smaller decline in real earnings than the higher-skilled (table 3). This is especially true for government workers in Nigeria, Senegal, and Zambia. In Zambia the starting salaries of unskilled workers in 1983 adjusted for inflation were 88 percent of what they had been in 1975; for undersecretaries, however, the share was only 43 percent. One way that governments have favored the unskilled has been by granting the same absolute increases to all groups. As a consequence, there has been a general compression of the wage scales of civil servants whereby the ratio of the highest to lowest salaries has been reduced over time (table 5). In Zambia, where there was a conscious government policy to narrow the gap between the higher and lower skill categories, undersecretaries are paid seven times as much as the lowest-salaried employee, compared with twenty times as much in 1971 and fifteen times as much in 1975. Although complete data are not available, differentials between higher- and lower-skill workers in the parastatal and private sectors also seem to have shrunk.

Within the government sector, the policy of compressing the wage structure over time has exacerbated the overall problem of declining real wages. Policies to reduce pay differentials between higher- and lower-level staff have been implemented without sufficient regard to staffing needs, vacancy, and turnover rates. Moreover, government policy has sometimes been directed at the parastatal and private sec-

Table 5. *Salary Compression in Selected African Countries, 1970–83*

Country and comparison	*1970*	*1975*	*1980*	*1983*	*Total percentage change in salary compression, 1975–83*
Malawi					
Civil service					
Undersecretary/unskilled	—	33.0	30.0	29.8	−9.7
Nigeria					
Civil service					
Permanent secretary/ unskilled	21.9[a]	17.6	15.4	9.2	−47.7
Private sector[b]					
Chief executive/unskilled	—	47.3[c]	25.1	17.6[d]	−62.8[e]
Sudan					
Civil service					
Deputy undersecretary/ unskilled	13.0	13.1	10.8	9.3[f]	−29.0
Zambia					
Civil service					
Undersecretary/lowest salaried employee	19.2[g]	14.5	10.3	6.9[h]	−52.4
Parastatal					
ZIMCO managing director/security guard	—	12.6	—	12.8	1.6
ZCCM supervisor/unskilled	4.7	5.4	4.8	4.4	−18.5
Private					
Construction worker—skilled/unskilled	—	1.6	1.3	1.2	−25.0

—Not available.

Note: Salary compression is measured as the ratio of basic starting salaries of the highest to lowest skill categories for which data are available.

a. Data are for 1972.
b. Median salaries.
c. Data are for 1976.
d. Data are for 1982.
e. Data are for 1976–82.
f. Data are for December 1983.
g. Data are for 1971.
h. Data are for November 1983.

Source: Civil service salaries: See table 3 for sources.

Parastatal and private sector salaries: Nigeria: 1976–80: *Pay Comparability Survey Report,* Pay Research Unit, Establishments Department, August 1980; checked against preliminary table on trends of pay in civil service since Udoji, 1982, from Public Service Pay Research Unit. 1982: *Preliminary Table on Rates of Wages and Regular Fringe Benefits, 1982,* from Wages and Productivity Unit. *Zambia:* ZIMCO: Data supplied by ZIMCO and contained in appendix B1, Actual Salary Notches on ZIMCO Corporate Salary Structure, of 1984. ZCCM: Data provided by the Copper Industry Service Bureau, Pay Research Unit, Kitwe. Construction: Data collected from collective agreements between the Employers Association of the Building and Civil Engineering Industry and the Union of Building, Engineering and General Workers. See Meesook and others 1986, appendix tables 11, 12, and 16.

tors as well, so that real wage rates for the unskilled have been kept up relative to those for higher-skilled groups.

At the higher end of the scale, relatively low salaries have resulted in difficulties for the government in attracting and retaining qualified staff, many of whom leave for other sectors or other countries. The loss of skilled manpower and the decline in productivity of the remaining higher-level staff together are also likely to have adverse effects on the productivity of the rest of the staff who are managed by them. The compression in the wage structure over time also appears to have reduced the incentives of workers to acquire skills, as has been reported for the construction industry in Zambia. This trend should be a source for concern for the long run.

Policies of "narrowing the gap" beyond relative wage adjustments dictated by market forces have had several motivations. They have been supported by trade union movements, especially in Zambia. They are consistent with elements of African socialism, the political ideology expounded by many leaders. They are defended on the basis of equity objectives. Although there may have been grounds for some narrowing of wage differentials in postindependence Africa, we do not believe that recent wage compression in the public sector has necessarily improved income equity within each nation as a whole. In fact, if such pay policies compromise the performance of the public sector, a general decline in national income, not an improvement in income equality, may be the main consequence.

In general, policies that lead to compression in salary structures may be politically more acceptable than alternative measures during periods of economic downturns and declining national income. Furthermore, market forces, especially the rapid expansion since the 1960s of schooling opportunities and hence of educated manpower, have probably warranted a narrowing in various dimensions of the wage structure over time. In some African economies, however, the degree to which the government has compressed the salary structure may have created significant problems of labor allocation whose negative consequences may persist for a substantial period of time.

Another related consequence of government pay policies is the resulting relationship between the salary levels and structures in the government and those in the parastatal and private sectors.[7] Although the data are poor, they suggest that salaries in parastatals are generally higher than those in the civil service for all grades and that private companies pay skilled workers more, and unskilled workers less, than does the government (see table 6).

In Zambia the parastatal premium over government pay for comparable jobs ranged from 13 to 48 percent for unskilled workers. A survey in Mali showed that salaries in the civil service were generally lower than those in state companies and private enterprises. Indepen-

Table 6. *Salaries in the Government, Parastatal, and Private Sectors in Selected Countries, 1980–84*

(government = 100)

Country and grade	Type of enterprise: Government	Public			Private
Liberia, 1983	*Government*				*Rubber concessions*
Unskilled worker	100				52
Mali, 1984 (basic salary)	*Civil service*		*State enterprises*		
Higher-level staff (category B7)	100		103		
Lower-level staff (category B1)	100		131		
Nigeria, 1982 (median salary)	*Public sector*				*Private sector*
Permanent secretary/chief executive (grade 17)	100				202
University graduate (grade 8–9)	100				176
Unskilled (grade 1)	100				*105*
		Public corporations			
Sudan, 1983 (starting basic salary)	*Central and regional government*	*Public corporations under 1976 act*	*National Electricity Corporation*	*Sudan Railways*	
Deputy undersecretary (grade 4)	100	121	125	104	
University graduate entry (grade 9)	100	125	125	108	
Secondary graduate entry (grade 14)	100	112	122	110	
Unskilled worker (grade 18)	100	104	113	110	
Uganda, 1983 (starting basic salary)	*Public service*		*Parastatals*		*Private companies*
High level (U1)	100		146		116
University graduate	100		146		187
Lowest level	100		129		109
Zambia, 1980 (starting basic salary)	*Civil service*		*Parastatals*		*Private companies*
Supervisor	*100*		*106*		*132*
Clerk typist	*100*		*93*		*112*
General laborer	*100*		*148*		*84*
Zambia, 1983 (average earnings per hour)					
Professional	100		131		144
Clerical	100		125		144
Laborer	100		113		79

Source: Liberia: Khan 1983, p. 20. The author reports that "the results are at best crude approximations and they conceal a good deal of variation within each sector." Nevertheless, he concludes that "the wage rate in the Government sector is completely out of line with that in the other parts of the economy" and that the differential has been widening. *Mali:* Lardeau and others 1985, table B-5. *Nigeria:* "Preliminary Table on Rates of Wages and Regular Fringe Benefits, 1982" from the Wages and Productivity Unit, as reported in Suebsaeng 1984, table 7. *Sudan:* Lindauer and Meesook 1984b, table 4.2. *Uganda:* Meesook 1983, table 1. The figures reported are based on average basic salaries for comparable employees in five parastatal and two private companies obtained from salary scales and information provided by the companies. *Zambia:* Meesook and others 1986, tables 4.8 and 4.7.

dent studies of Tanzania reveal that in both 1971 and 1980 parastatal employees received wages significantly different from those of workers in the private sector, and in both cases more than those of government workers. By comparison, in Kenya occupational wage differentials by employer generally seem to be less significant.[8]

In evaluating pay differentials for workers of comparable skills and qualifications across the government, parastatal, and private wage sectors it is important to compare not only basic salaries but also fringe benefits, allowances, and other job characteristics (see table 7). Given differing degrees of job security across employer groups, complete wage parity for even similar categories of workers should neither be expected nor desired. Moreover, wage parity, which is consistent with the efficient allocation of labor under perfect competition, may not be consistent with efficiency under alternative market structures.[9] Thus, although the difference between private and government wages may signal the direction in which the government may wish to adjust its wage, the private wage is not necessarily the one that should be offered by the government, since government wage and employment actions will in turn affect the private wage. However, in some settings the existence and persistence of public wages higher than comparable private ones, or of parastatal wages higher than comparable government ones, may constitute a monopoly rent that is both costly and inequitable to the extent that it accrues only to those workers fortunate enough to secure the better-paying positions.

Few parastatal enterprises have complete autonomy over their own pay scales. Governments play a big role and ought to permit state enterprises to attract and maintain qualified staff. However, since parastatals are often operated without strict regard to commercial principles, the government also ought to be concerned to prevent generous salaries from translating simply into losses absorbed by the government treasury. In most African countries parastatals have been able to obtain finance from the government when they have run at a loss or lacked the resources for investment. This ease of financing has reduced management incentives to operate efficiently and control the wage bill. Higher pay in parastatals may also lure qualified civil servants out of their ministries. Thus the public enterprise sector may benefit from the government in two ways: from receiving transfers of financial resources and from being able to use these resources to attract skilled workers away from the government.

As a result, some governments have tried to force parastatal pay to conform to government levels. The Udoji pay reforms instituted such an alignment in Nigeria in the mid-1970s. In Sudan many parastatals come under the 1976 Public Corporations Act and are governed by a common salary scale. In Zambia the authorities unified the salary scales for the government and parastatal companies in 1975.

Table 7. *Fringe Benefits in Selected African Countries*

Country	*Benefit*
Liberia	*1981:* Commission to look into public corporation salaries found that nonsalary benefits in the public corporations for higher- and lower-level employees were substantially better than those provided in the government. The lower-skilled categories in the government do not receive any fringe benefits except for some transportation allowances.
Mali	*1984:* Civil servants received on average allowances and benefits equaling 27.5 percent of total compensation, or 37.9 percent of basic salary.

Allowances and benefits differ between the government and parapublic organizations:

Benefit	*Civil service*	*Parapublic*
Family allowance	CFAF 1,000 per child per month	CFAF 500 per child per month
Medical	Basic plan	Slightly better
Workman's compensation	Basic plan	Slightly better
Retirement	Better	Basic plan
Housing	Provision for some (<1 percent in Bamako area). 20 percent of estimated market rent is deducted from salary.	None, but long-term, low-interest loans are available for purchase of housing.

Malawi — *Government, 1983:* All government employees are eligible for housing. Approximately 85 percent are housed and pay 10–12 1/2 percent of basic salary in rent. Those waiting for housing do not receive any allowance or benefit; 77 percent of them are eligible for the lowest type of housing (class F).

Public enterprises, 1983: Housing benefits system parallel with government. Employees pay 5–7 1/2 percent of basic salary in rent.

Nigeria — *1982:* All fringe benefits taken together can constitute 35–100 percent of basic salary. Civil servants receive either government quarters accommodations or a housing allowance. Private employees receive free furnished housing or an allowance.

Housing allowances as a percentage of median salaries:

Level	*Public*	*Private*
Permanent secretary (level 17)	5	9–31
University graduate (level 8–9)	11	7–17
Unskilled (level 1)	8	7–22

For both public and private sectors, transportation is an equally important allowance; sometimes transport allowances exceed housing allowance benefits. The leave allowance is also significant for employees in both sectors.

Senegal — *Government, 1984:* Budget figures show that on average civil servants' fringe benefits account for 64 percent of base pay; for public enterprises, they constitute 53 percent of base pay. Very few government officials have the right to be housed—only the top grades and regional governors. They either get housing for which they pay 35 percent of base salary in rent or an allowance of 100,000–250,000 francs per month. Most prefer to be housed. In 1984, the average salaries of top officials ranged from 150,000–203,000 francs per month; thus, housing allowance as a percentage of average salary ranged from 67 to 123 percent. If, however, persons in the highest hierarchies do get housing, it is estimated that an average leased property is worth 415,000 francs

(continued)

Table 7 *(continued)*

Country	*Benefit*
	per month, the average mean income of hierarchies A & B equals 160,000 francs per month; 40,000 francs of rent must be paid per month. Thus the estimated value of getting housing equals 47 percent of base pay. Many teachers who used to be eligible for housing have lost their rights to be housed, but instead receive 25,000 francs per month allowance. The government also provides indemnities for doing unpleasant work. There are also productivity bonuses and numerous other benefits. *Parastatals, 1984:* Provisions are similar to the government. Modest housing allowances are provided to a small number of employees.
Sudan	*Government:* Fringe benefits and allowances are relatively unimportant. Free or heavily subsidized housing is not generally provided by the government. *Public corporations:* In general offer better benefits and allowances compared with the government. Sudan Railways (with allowances estimated at 25 percent of basic salaries) also provides housing at nominal rent to some staff.
Uganda	*Government, 1983:* Fringe benefits and allowances are unequally distributed across grades. With regard to housing, there are only 4,000 government pool housing units; those in grades U5 and above are eligible but only the very top officials are likely to get housing and they pay a nominal rent. The rest of those who are eligible for housing but do not get it, as well as those who are not eligible, do not get an allowance to compensate. Estimated value of housing benefits as a percentage of basic salaries:

Level	*Public*	*Parastatal*	*Private*
High	102–358	45–275	16–17
Middle (university graduate)	40	50–235	16–63
Low	None	30–85	24

It must be noted that transportation allowances are large in the parastatal sector for middle- and high-level employees, in some cases amounting to more than housing allowances. They are also important for high officials in the government.

Zambia — *Government, 1983:* Approximately 62 percent of eligible civil servants are housed; 35 percent are on waiting lists and receive an allowance; 3 percent own their own homes and receive an allowance.

Parastatals, 1983: Approximately 74 percent of all employees are provided with housing. Others receive an allowance.

Private companies, 1983: Do not generally provide housing except for very high executives. Employees receive an allowance.

Housing benefits as a percentage of basic salaries:

Level	*Estimated value for those provided with housing*	*Those receiving allowance*	*Those receiving homeowners allowance*
S3	43	8	35
S7	63	11	43
S12	90	12	54
S21	90	25	57

Source: Liberia: Khan 1983, pp. 13–14. *Mali:* Lardeau and others 1985. See, in particular, table B-7. *Malawi:* Lindauer and Meesook 1984a. *Nigeria:* Suebsaeng 1984, table 7. *Senegal:* Bloch 1985. *Sudan:* Lindauer and Meesook 1984b, pp. 11, 33. *Uganda:* Meesook 1983, pp. 4–5 and table 1. *Zambia:* Meesook and others 1986, p. 84, p. 90, and table A.2.2.

Under such arrangements parastatal companies usually find ways to circumvent specified salary scales and so maintain a premium over government pay. In Zambia, for example, an extended scale for professional and technical workers was instituted in the parastatals, allowing salaries to be increased by as much as 40 percent of their basic levels. Where parastatals are unable to add a premium to their basic pay, they often lose (or fail to recruit) skilled technicians and senior managers, because of competition from private employers, both domestic and foreign. Thus, attempts to control parastatal pay by legislating uniform salary scales have a tendency to fail eventually. Giving public enterprises the incentive to operate on commercial principles is likely to be the best strategy for minimizing the problems associated with the determination of pay in the public sectors.

Forms of Compensation

As already noted, fringe benefits are widespread in Africa, though they vary greatly among countries, sectors, and grade levels.[10] Housing, for example, is often provided by African employers, especially by the public sector—but it is not a customary fringe benefit in Sudan.

Nonwage benefits affect compensation in a variety of ways, beyond the trends that have already been discussed in the real value of wages. First, fringe benefits and allowances often constitute a significant fraction of total compensation and of the government's wage bill. Second, in virtually all countries, fringe benefits and allowances are unequally distributed across grades, with senior officials typically receiving relatively more generous benefits. For instance, in Malawi, most of those waiting for housing are the lowest paid, who do not receive any allowance or benefit to compensate. In Uganda only top officials are likely to be housed; the rest of those who are eligible for housing but have not received it, as well as the majority of employees who are not eligible at all, do not get any allowance to help meet housing costs. Third, housing is usually considered by government employees to be their most valuable fringe benefit and those who have the choice would always prefer to get housed rather than to receive an allowance. Housing is generally inelastic in supply and expensive. Employees who manage to get government quarters pay a nominal rent (usually not exceeding 10 percent of basic salary) and thus end up in a better position relative to their counterparts who have to pay higher rents at market prices. Fourth, the quality of government-provided housing often bears little relation to the income of the recipient. Government workers may receive housing built according to standards dating back to the colonial period, with a market rental value which may equal or surpass the recipients' basic wages. Such a system

clearly wastes scarce resources, since it imposes an overconsumption of housing on civil servants. Fifth, transportation allowances are significant for some senior officials in certain countries. Finally, there are indications that fringe benefits are more generous in the parastatal sector than in the government. Indeed, increasing the provision of fringe benefits is one way to evade governmental attempts to hold down wages in parastatal companies.

In many African countries civil servants have come to expect certain fringe benefits more or less as a right. Governments, however, are finding it increasingly difficult to maintain their provision, especially of housing. Thus, the system often results in cases where individuals in the same grade have very different levels of total compensation, depending on whether or not they have government housing. Such a system produces obvious inequities as well as inefficiencies. Whenever compensation becomes separated from performance and remuneration is tied to connections or the "luck of the draw," the payment system becomes less effective as an incentive for performance and more open to the possibilities for corruption.

Many African economies now face the task of financing their compensation systems under severe budgetary difficulties. Throughout Africa government workers are experiencing frequent arrears in their wages. In addition, benefits to which they are entitled, either by law or custom, are often not provided. Housing is the most obvious example but health benefits, pensions, and other payments are also often not received. As part of the overall solution to budget deficits, a broad restructuring of compensation packages would be desirable. A growing awareness of the need for reform is evident in several countries.[11]

Government Employment

After independence, public employment in many African countries grew in response to increased demand for public services, especially in education and health care. Although data are poor, especially those on parastatal employment, it is clear that government employment has been growing, often rapidly, in all countries in our sample (see table 1). In Sudan the creation of stronger regional governments during the mid-1970s resulted in the total number of budgeted positions expanding by 2.6 percent a year—even though regionalization was supposed only to transfer staff from the central to regional bureaucracies. In Nigeria public employment increased partly as a result of the creation of administrative units in newly formed states. At the same time federal civil service employment tripled between 1971 and 1983. The government of Senegal has apparently felt obliged to hire workers to reduce unemployment, particularly of secondary and university graduates. Shortly after the change in regimes in Liberia in

1980, government employment expanded rapidly, apparently far in excess of any reasonable projection of the demand for public services. By comparison, Zambia seems to have been more restrained in its expansion of government employment—although government employment per capita started at a much higher level (see table 2).

Many explanations are offered for growing government employment. General economic contraction and stagnating agriculture seem to have limited the job opportunities in the private sector. The pressures of rising urban unemployment may have influenced many governments to expand public employment beyond what their fiscal resources could comfortably bear.

Lack of the appropriate data makes it difficult to assess the relative changes in employment of different groups of government employees. Nonetheless, the numbers of lower-skilled employees seem to have grown relatively faster. For example, in Zambia between 1978 and 1983 the number of classified daily employees grew at an annual rate of 4.2 percent compared with 1.3 percent for civil servants. In many countries (such as Nigeria, Sudan, Uganda, and Zambia) daily employees form a group separate from other civil service grades. Accurate records of their numbers are not kept, so when a freeze or ceiling on increases in government employment has been imposed, hiring extra daily workers becomes a way of evading the regulation. Furthermore, they are paid from a budget separate from other civil servants. Although the daily-paid are considered to be temporary workers, in Zambia many of them have been at their jobs for years. Their average wage is comparable to the average salary of the lowest-paid civil servant.

While the public sector expands its payroll, it is often also plagued by skill shortages. For example, in Zambia job vacancies in the government for doctors, technicians, engineers, and accountants cannot be filled. Uganda, too, has shortages, especially of accountants. Some countries have been affected by labor demands from abroad. Higher wages in the Gulf states have drawn experienced labor out of Sudan. In Mali teachers have migrated to neighboring countries in response to better pay.

The growth in government employment in many countries has tended to exacerbate the difficulties of administering wage policy in the public sector. Employment growth has not necessarily occurred for skill categories in short supply, such as doctors, accountants, and skilled administrators. This leads to a changing input mix of labor skills in the government. Efficiency problems in the government may be in part a consequence of the failure to maintain appropriate labor skill complementarities. The greater numbers of government employees at lower skill levels also diminish the government's ability to make pay levels more attractive for the skilled personnel it needs.

Government Wage Bill

Despite the fall in real wages in the public sector, the government wage bill has been widely seen as a source of economic difficulty. A significant share of total government expenditures goes to pay government employees. This share has been growing. In Zambia it increased from 18 percent in 1970 to 28 percent in 1983; the wage bill rose at an annual rate of 12.8 percent, compared with 8.9 percent for total government expenditure. In Senegal the average rate of growth of the government wage bill since 1978–79 has been 14 percent, representing an increase in real terms over this period. In one extreme case, wages and salaries as a proportion of total public revenue in Liberia jumped from 36 percent in 1977–78 to 66 percent in 1981–82.

Both increases in employment and in nominal wages and salaries have contributed to the rise in the share of the wage bill over time. For Zambia the increase in the wage bill between 1978 and 1983 can be divided as follows: 84 percent from nominal salary increases to existing staff, and the remaining 16 percent from increases in staff numbers. Since the number of classified daily employees grew faster than that of established staff, and their salary increases were also relatively greater, their share of wages increased over this period.

The increase in the share of the wage bill in total government spending has put a squeeze on other types of expenditures. These include complementary inputs, needed in the production of government services (such as paper, typewriters, cars, and gasoline in the case of Uganda). Such changes in the input mix signal potential inefficiencies in the use of government resources. Furthermore, increases in wage expenditures, other things being equal, imply a decrease in capital expenditures, which are urgently needed in these countries for their long-term development.

Policy Issues

The consequences of falling real wages in the public sector have in extreme cases (such as Ghana, Sudan, and Uganda) been a demoralization of the civil service and a deterioration in government performance. In Uganda in 1982 the Public Service Salaries Review Commission found that "the civil servant had either to survive by lowering his standards of ethics, performance and dutifulness or remain upright and perish. He chose to survive."[12] Of course, the ongoing political tension in Uganda has also significantly contributed to the falling productivity of government employees. However, along some margin, declining real wages must be expected to affect work performance.

In Uganda it has been estimated that government employees spend only one-third to one-half of their normal working hours on government work; the rest of the time is devoted to other jobs that they take

in order to survive, such as farming or trading. The deterioration in civil service performance has occurred at a time when, more than ever, governments require an efficient administration to help bring rapid economic recovery.

Declining real pay and deteriorating job performance are not independent of each other; civil servants' work effort is not wage inelastic. The response of workers to declining real compensation is complex. Workers may seek other opportunities where the relative returns to their effort are higher. They may do so by leaving or simply not joining the public service. They may also moonlight, either on or off the job. Another alternative is for workers to increase their leisure time by decreasing their work effort.

What compounds the problem is that, once such responses become widespread, discipline breaks down in government offices. Supervisors lose the ability to reprimand their subordinates for not spending the right time and effort on the job because they are themselves guilty of the same transgressions. Moreover, the most productive workers, especially among the highly skilled, are the ones most likely to be offered jobs outside the government. This lowers overall productivity in the civil service, both because of the workers' own departure and through their effect on the performance of those who stay behind.

There are no simple solutions to the problem of declining productivity among civil servants. The policy recommendations summarized here can only provide some guidelines and suggest feasible action that governments might wish to adopt. Yet it is clear that some pieces of conventional wisdom have been unhelpful: that "African wages are too high" and that inappropriate real wage levels and structures in African countries have been maintained over time. In some instances, especially where there exists an excess demand for government jobs—often for the least-skilled positions—further downward adjustment in real wages may be called for. But, in other cases, government wage offers should be made more competitive with the opportunity cost of scarce labor skills.

One remedy to improve upon current imbalances would be for governments to stop trading off higher wages for employment expansion. There is a great deal of pressure for governments to hire more workers when the private sector is depressed. A government could, however, provide more and better services with a streamlined civil service rather than a larger one that has serious problems with productivity and discipline. Thus, a first option for governments is to consider reducing the civil service to an affordable and maintainable size. This option is particularly important in countries where recent growth in government employment has been especially rapid.

One practical action that can be taken is to audit existing posts and personnel, so as to determine which posts are essential for the functioning of the civil service and which are redundant. At a minimum

such an audit would provide the information necessary for the elimination of "ghost" employees, a phrase used in Liberia to describe the collection of salaries by employees who appear in name only.

Additional finance can be freed for increasing the relative wages of some remaining workers by freezing or reducing the number of public employees. This can be done by decree, attrition, or special schemes such as early retirement programs. Whichever strategy is chosen, the objective should be to achieve more manageable levels of adequately paid public employment over the medium term.

A second tradeoff that governments might consider is between wage increases for the highly skilled and the unskilled. The policy of compressing differentials may have adversely affected both efficiency and equity. Policies of narrowing the gap within the public sector have limited the government's ability to compete for highly skilled staff and may have significantly impaired the performance of the government sector. To alleviate resulting shortages of skilled workers will usually mean allowing for a widening, not a narrowing, in wage differentials.

There is also a need for firmer financial controls over the provision of fringe benefits. Similarly, the system of who is entitled to what needs to be defined more clearly. Because governments are unable to provide benefits such as housing uniformly to all workers at the same level, the pay of similar workers tends to vary widely—an inefficient and inequitable outcome. Moreover, the associated system of rationing permits corruption and wastes the time and effort workers spend trying to get housing. Since the provision of fringe benefits, especially housing, has become such a financial and administrative burden, governments may wish to move toward a more cash-oriented compensation system. In a perfectly competitive world, a cash-based system, because it increases the choices consumers can make, would be preferable to one involving payments in kind. However, it will not be possible to transform the compensation system overnight given the existing stock of government housing. In the meantime, housing can still serve to widen wage differentials where this is desirable.

Public enterprises, which are often covered by government pay policies, tend to have more flexibility than the government itself in wage-setting practices. Government policy toward the parastatals should be directed at preventing them from exploiting any monopolistic advantages they might have. Forcing parastatals to follow a government salary scale is likely to create other management problems, especially in staffing and performance. A long-run policy of making parastatals commercially accountable may be a better approach.

Abstract

This article documents recent trends in government wage and employment levels for a number of African countries and challenges the conventional wisdom that public

wages are too high in Africa. Although most countries have significantly adjusted the real wages of government workers over the past decade, considerable variance in cross-country experience with regard to government wage levels, wage structures, and employment growth is evident. On the basis of the observed trends, the article calls for a more microeconomic focus on the relationship between government pay and employment policies and on the real consequences of such policies on the government's ability to provide goods and services.

Notes

1. From World Bank (1981). This view is repeated and elaborated upon in World Bank (1986): "Personnel policies in the public sector [in African economies] must also change: they influence urban earnings because the government and public enterprises are the largest employers in most countries. Public sector hiring and wage policies have inflated wages in many cases and left them out of line with productivity and labor costs in other developing countries. Although earnings data are poor and difficult to compare between countries, indicators for selected African and Asian countries reveal that government and urban wages in low-income Africa are relatively high. This salary structure was adopted at the time of independence and then maintained in many African countries through most of the 1970s; it must be adjusted to reflect current budgetary realities." Further arguments for institutional interventions as sources of wage distortions in developing economies appear in Kannappan (1983).

2. Previous empirical work in this area includes Abdin and others (1983) and Heller and Tait (1983).

3. A precise definition of public employment cannot be given because the public sector is rarely a single homogeneous unit. In different countries it might include federal or national civil services, state and local governments, military services, parastatal companies, and joint ventures. We have tried to maintain a consistent definition that includes all levels of governments and wholly state-owned public enterprises. Notes to the various tables provide further details with regard to specific countries.

4. Wages and employment in the private sector are also influenced by other government actions, including minimum wage orders, wage guidelines, and legislation over collective agreements. In this article, our primary focus is on public sector pay and employment decisions.

5. Analyses of government pay policy in an advanced economy, that is, the United States, are presented in Fogel and Lewin (1974) and Smith (1977).

6. See Meesook and others (1986), table 4.1, for the Zambian experience.

7. Issues relating to the parastatal sector are explored more fully in Lindauer (1986).

8. See Lindauer and Sabot (1983) and Knight and Sabot (forthcoming).

9. This has been explored in Lindauer (1987).

10. For a description of fringe benefits in a selected number of African countries see Lindauer and others (1986), table 7.

11. In Malawi, for example, there is some sentiment toward eliminating housing as part of the compensation of civil servants and moving to a more cash-oriented system of pay.

12. The problem is extensively discussed in Republic of Uganda (1982). See, for example, chapter 6.

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EXPORT-PROMOTING TRADE STRATEGY
Issues and Evidence

Jagdish N. Bhagwati

The question of the wisdom of adopting an export-promoting trade strategy has recurred in the history of the developing countries. Development economics was born in an atmosphere of export pessimism at the end of the World War II. By the late 1960s, however, the remarkable success of the few economies that pursued "export-promoting" (EP) rather than "import-substituting" (IS) policies swung the weight of academic opinion behind the EP strategy. Aiding this process were numerous academic findings from research projects around the world, which investigated both these EP successes and the failures of the IS countries.[1]

The debt crisis of the 1980s, the sluggish world economy, and the continuing depression of primary product prices have revived export pessimism afresh. It is time again, therefore, to examine the old and new arguments that question the wisdom of the EP strategy.

The early postwar arguments in support of export pessimism are briefly reviewed below, before the precise content of an EP strategy is stated. The article then considers a few salient lessons that have emerged in the studies on the advantages of the EP strategy and examines several new sources of skepticism concerning export-promoting trade policies. The contrasts between the old (postwar) pessimism and the new pessimism prevalent today are then exploited briefly to draw a central policy lesson for the developing countries, especially in regard to the multilateral trade negotiations (MTN).[2]

The First Export Pessimism

It is well known that export pessimism characterized the thinking of most influential development economists and policymakers in the developing countries after World War II. The most articulate pro-

ponents of the pessimist school of thought were the two great pioneers of development economics: Raul Prebisch (see Prebisch 1952 and 1984) and Ragnar Nurkse (see Nurkse 1959). Their diagnoses, however, had significant differences.

Prebisch considered the terms of trade of primary products, then the chief exports of developing countries, to be declining regardless of the policies of the developing countries. Left to themselves, producers in the developing countries would have responded to this secular price shift by industrializing, which would make (trade tariff) protection or (domestic subsidy) promotion unnecessary and unjustified.[3] By contrast, Nurkse's export pessimism arose from the notion that foreign markets simply could not accommodate imports on a sufficient scale as developing countries accelerated their development. Therefore, export pessimism explicitly meant "elasticity" pessimism, and the case for government intervention then follows.[4] Nurkse, therefore, advocated what he called a policy of "balanced growth."

Paradoxically, however, Nurkse was mindful of the costs of indiscriminate protectionism, as he had also written about the collapse of the world trading system during the 1930s (Nurkse 1953). "Balanced growth" could only mean government incentives to assist industrialization, a prescription that appears to have combined uneasily with the caveats that Nurkse expressed about protection. By contrast, Prebisch's brand of pessimism did not justify protectionism but was nevertheless widely used by his followers to do so in Latin America.

The export pessimism of these influential economists was cast in the mold of natural forces and phenomena that the developing countries faced. Nurkse, for instance, wrote about increasing economy in the use of raw materials and a shift further from natural to synthetic materials, both dampening the demand for developing countries' exports over time. Developing countries could do nothing to change these conditions at the source, just as one cannot do anything about bad weather. But their policies had to adjust to these conditions, just as one can buy an umbrella against the rain. (By contrast, as I note below, the second export pessimism of the 1980s is rooted in protectionist threats, which can be addressed at the source and hence have critically different implications for developing country policies.)

The export pessimism following World War II was to prove unjustified by the unfolding reality. World trade did not merely grow rapidly during the 1950s and 1960s, it grew even faster than world income. The growth rates in both output and trade were unprecedented for such sustained periods (see table 1). Furthermore, the economies that shifted quickly to an EP strategy experienced substantial improvements in their export performance. This was particularly the case for four Far Eastern economies—Hong Kong, Singapore, the Republic of Korea, and Taiwan—but it was by no means confined to them. The

Table 1. ***Postwar Growth Rates of World Output and Trade***
(average annual percentage change)

Period	*World output*	*World trade*
1953–63	4.3	6.1
1963–73	5.1	8.9
1973–83	2.5	2.8

Source: Hufbauer and Schott 1985, table A-1, p. 97.

dramatic rise in these economies' share of trade in GDP over this period placed them well above the regression lines for trade-GDP ratios and per capita incomes. These regressions would suggest that trade-GDP ratios fall as per capita income rises, whereas these successful exporters showed a spectacular rise in their trade shares as their per capita incomes grew rapidly.[5] Clearly, history has sided with economists such as Cairncross (1962) and Krueger (1961) who had been among the foremost critics of export pessimism.

Although the evidence of successful trade expansion decisively refuted the validity of export pessimism, the economic analysis in support of such pessimism was also to prove enlightening and has a bearing on the dissection of the resurgent, second export pessimism prevalent today. Nurkse, for instance, had embraced Robertson's classic phrase: trade as "an engine of growth," which established a rather strong and direct link in the export pessimists' minds between external conditions and internal expansion. In a classic throwback to this form of argumentation, Lewis (1980) argued more recently in a much-quoted passage:[6]

> The growth rate of world trade in primary products over the period of 1873 to 1913 was 0.87 times the growth rate of industrial production in the developed countries; and just about the same relationship, about 0.87, also ruled in the two decades to 1973... We need no elaborate statistical proof that trade depends on prosperity in the industrial countries (p. 556).

But, it is evident from several analyses,[7] the latest being by Riedel (1984), that such stable relationships (which suggest the exclusive dominance of demand in determining trade performance) simply cannot be extracted from the export experience of developing countries in the postwar period. The export performance of these and other countries must be explained by domestic incentives (or supply) more than by external (or demand) conditions. It is worth restating the two main arguments supporting this conclusion.

First, although Lewis addresses the linkage between industrial country incomes and developing country exports of primary products,

Riedel (1984, table 4) shows that even this aggregate developing country relationship is not stable. The stability, in turn, obviously cannot be maintained for individual developing countries.

Second, it is important to note again that the postwar period has seen a dramatic shift in the export composition of developing countries toward manufactures. Developing country exports of manufactures grew threefold in the 1955–78 period and represented one-fourth of overall exports. Manufactures are now close in magnitude to the other nonfuel exports such as food, minerals, and agricultural raw materials. Of course, the successful exporters of the postwar period dominate this shift. But their experience, based on domestic policies, proves that one cannot assess trade potential through mechanical linkages to industrial country income expansion.

The most compelling aggregate statistics show that during the prosperous 1960s, developing countries' exports of manufactures grew nearly twice as fast as the industrial countries' incomes. The expansion of developing countries' trade over the 1950s and 1960s occurred as protection in the industrial countries was diminishing sharply as a consequence of first the elimination of quotas and then the reduction in tariffs. Even during the troubled 1970s, developing countries' exports of manufactures grew more than four times as rapidly as the industrial countries' income.[8]

The only key question that has remained at issue, therefore, is what has been called the "fallacy of composition": can all, or most, developing countries become successful exporters simultaneously? Or, focusing on the successful Asian exporters, the question may be put: can the Asian export model be successfully exported to all? The suspicion still lingers that the success of a few was built on the failure of the many and that, if all had shifted to the EP strategy, none would have fared well.

There are two distinct sources of this worry. The first presumes that markets would not be able to absorb all of the exports that would materialize if developing countries shifted to an EP strategy. The second argues that while the markets could be found, they would be closed by protectionist measures, provoked by the import penetration and outcries of market disruption. The second source is the major cause of export pessimism today, while the first source was the one that afflicted the earlier wave of export pessimism. I now examine the former argument and defer discussion of the latter.

First, as I shall argue more fully below, the fear that world trade would have to grow by leaps and bounds if most developing countries pursued an EP strategy is unwarranted. This fear follows from trying to put all countries on the curve estimated in Cline (1982) for the Asian exporters with very high ratios of trade to national income. The pursuit of an EP strategy simply amounts to the adoption of a

structure of incentives which does not discriminate against exports in favor of the home market. This does not imply that the resulting increases in trade-income ratios will be necessarily as dramatic as in the Far Eastern case.

Second, the share of developing countries in the markets for manufactures in most industrial countries has been, and continues to be, relatively small. In the aggregate, the share of manufactured exports from developing countries in the consumption of manufactures in the industrial countries runs at a little over 2 percent. "Absorptive capacity" purely in the market sense, therefore, is not prima facie a plausible source of worry.

Third, a chief lesson of the postwar experience is that policymakers who seek to forecast exports typically understate export potential by understating the absorptive capacity of import markets. This comes largely from having to focus on known exports and partly from downward estimation biases when price elasticities for such exports are econometrically measured. Experience underlines the enormous capacity of wholly unforeseen markets to develop when incentives exist to make profits; "miscellaneous exports" often represent the source of spectacular gains when the bias against exports, typical of IS regimes, is removed.

Fourth, trade economists have increasingly appreciated the potential for intraindustry specialization as trade opportunities open. The progressive dismantling of trade barriers within the European Communities (EC), for instance, led to increased mutual trade in similar products rather than to massive reductions in the scale of output in industry groups within industrial member states.[9] There is no reason to doubt that such intraindustry trade in manufactures among developing countries and between them and the industrial countries can also develop significantly.

Finally, if we reckon with the potential for trade between developing countries where policies can change to permit its increase, and the possibility of opening new sectors such as agriculture and services to freer trade, then the export possibilities are even more abundant than the preceding arguments indicate.[10]

Therefore, although the postwar export pessimism was unjustified, it provided a rationale for the adoption of inward-looking trade policies in many developing countries. In addition, trade restrictions were adopted to protect the industries that had grown up fortuitously in Latin America because World War II had provided artificial inducement to set up domestic capacities to produce interrupted supplies from traditional, competitive suppliers abroad.[11] Often, chiefly in Latin America, there was also a reluctance to devalue. Combined with high rates of inflation, this caused continuously overvalued exchange rates that amounted to a de facto IS trade policy (see the appendix).[12]

What Is an Export-Promoting Trade Strategy?

What exactly is meant by an export-promoting trade strategy? Clarification of the question is important, especially as the everyday usage of this phrase evokes many unrelated notions.

The definitions of EP and IS that are most widely accepted, and are used by economists who have long studied these matters, relate to incentives. The IS strategy is defined as the adoption of an effective exchange rate for the country's exports (EER_x) which is less than that for imports (EER_m). EER_x would include, for a peso currency country, not just the pesos earned at parity from a unit dollar's worth of export, but also any export subsidy, tax credits, and special credits. (It would also include, say, for tractor export the subsidy on the input of steel that is used in the exported tractor, so that there is no distinction between EER comparisons defined on value added or gross value, for the purpose at hand.) Similarly EER_m would add to the parity any import duty, import premiums resulting from quantitative restrictions (QRs), and other charges. If a dollar's worth of exports fetches altogether 100 pesos, whereas a dollar's worth of imports fetches 130 pesos, the incentive structure implies $EER_x < EER_m$. This constitutes a "bias against exports," a concept that seems to have come independently into use in Bhagwati (1968), Little, Scitovsky, and Scott (1970), and Balassa (1971). This is also the hallmark of the IS strategy: it creates a net incentive to import-substitute relative to what international prices dictate.

Suppose, however, that EER_m yields 100 pesos per dollar's worth of imports, while EER_x is also 100 pesos. Then, the home market sales will give a producer as much as exporting will: the incentive structure then implies $EER_x = EER_m$. Thus bias against exports will have been eliminated. This is defined as the EP strategy.

These definitions of EP and IS strategies are now in common usage. But they do raise a question: how do we christen the case where there is a significant excess of EER_x over EER_m? Where the effective exchange rate is more favorable for exports than for imports, should we not call that EP instead of the one where $EER_x \approx EER_m$ as the above definitions do, and instead call the case with $EER_x \approx EER_m$ simply the trade-neutral or bias-free strategy? Perhaps that might have been the ideal way to do it. But the EP strategy came to be defined in the academic literature as the one with bias-free incentives simply because the empirical studies of the four Far Eastern economies, particularly in the NBER project, strongly suggested that these successful outward-oriented developers were closer to neutrality than to a substantial positive bias in favor of exports.[13] Furthermore, countries that went from an IS strategy to a neutral strategy, which eliminated the bias against exports and improved their export performance, prompted researchers to define EP strategy in terms of neutrality. Given the now common

usage of these terms, therefore, I have suggested recently the following terminology that does least violence to what has been the practice to date:[14]

IS strategy:	$EER_x < EER_m$
EP strategy:	$EER_x \approx EER_m$
Ultra-EP strategy:	$EER_x > EER_m$

Nonetheless, it is not uncommon, especially among policymakers, to find references to EP (or outward-oriented) trade strategy as including both the neutral and the pro–export bias strategies.[15] The reader must be alert to see what exactly is the implicit definition being used in a particular context.

These definitions clearly relate to average incentives. Nonetheless, it is obvious that, within EP for instance, some activities may be import-substituting in the sense that their EER_m exceeds the average EER_x. Thus, the pursuit of either the EP or the ultra-EP strategy does not preclude import-substituting in selected sectors. This is true for most of the successful Far Eastern developers. Nor does this fact render meaningless the distinction among the different trade strategies, as is sometimes contended. As I have argued elsewhere (Bhagwati 1986c):

> We also need to remember always that the average EER_x and EER_m can and do conceal very substantial variations among different exports and among different imports. In view of this fact, I have long emphasized the need to distinguish between the questions of the degree of import substitution and the pattern of import substitution. Thus, within the broad aggregates of an EP country case, there may well be activities that are being import-substituted (i.e., their EER_m exceeds the average EER_x). Indeed there often are. But one should not jump to the erroneous conclusion that there is therefore no way to think of EP versus IS and that the distinction is an artificial one—any more than one would refuse to acknowledge that the Sahara is a desert, whereas Sri Lanka is not, simply because there are some oases (p. 93).

Nor should one equate the EP strategy with the absence of government intervention, as is often done by proponents of the IS strategy and sometimes by advocates of the EP strategy as well. It is true that a laissez-faire policy would satisfy the requirement that $EER_x = EER_m$. This is not a necessary condition for this outcome, however. The Far Eastern economies (with the exception of Hong Kong) and others that have come close to the EP strategy have been characterized by considerable government activity in the economic system. In my judgment, such intervention can be of great value, and almost certainly has been so, in making the EP strategy work successfully. By publicly supporting the outward-oriented strategy, by even bending in some cases toward ultra–export promotion, and by gearing the credit insti-

tutions to supporting export activities in an overt fashion, governments in these countries appear to have established the necessary confidence that their commitment to the EP strategy is serious, thus inducing firms to undertake costly investments and programs to take advantage of the EP strategy.

The laissez-faire model does not quite capture this aspect of the problem since governments, except in the models of Friedman and Bakunin, fail to abstain or self-destruct; they will invariably find something, indeed much, to do. Therefore, explicit commitment to an activist, supportive role in pursuit of the EP strategy, providing the assurance that it will be protected from inroads in pursuit of numerous other objectives in the near future, would appear to constitute a definite advantage in reaping the benefits of this strategy.

Some other caveats are also in order.

Development economists such as Chenery and his many associates have used the terminology of IS and EP in a wholly different fashion. They have typically used identities to decompose observed growth of output in an industry or the economy into components attributable to export promotion, import substitution, and other categories.[16] Quite aside from the fact that such decompositions are, except under singular circumstances, statistical descriptions without analytical significance, they also have no relationship to the incentives-related definitions of trade strategy that have been set out here. Unfortunately, this distinction occasionally gets confused in popular discussions, especially as economists sometimes deploy both usages simultaneously (that is, using the incentives-based definition to group countries into alternative categories and the Chenery-type terminology to explain their economic performance, as in Balassa 1983).

The incentives-defined EP strategy also has to be distinguished from the traditional concept of "export-led" growth, in which a country's exports generate income expansion attributable to direct gains from trade and indirect beneficial effects. The notion of export-led growth is closer to Nurkse's and Lewis's export pessimism that was dissected earlier. The incentives-related EP definition has literally nothing to do with such beneficial external phenomena. Whether the success of an EP strategy, defined in terms of freedom from bias against exports, requires the presence of a beneficial external environment is a separate issue that will be treated again in a later section that focuses on the revived export pessimism.

Finally, it is worth stressing that the concept of EP or outward orientation relates to trade incentives (direct trade policies or domestic or exchange rate policies that affect trade) but does not imply that the EP strategy countries must be equally outward-oriented in regard to their policies concerning foreign investment. Hong Kong and Singapore have been more favorable in their treatment of foreign investors

than the great majority of the IS countries, but the historic growth of Japan, presumably as an EP country, was characterized by extremely selective control on the entry of foreign investment. Logically and empirically, the two types of outward orientation, in trade and in foreign investment, are distinct phenomena, though whether one can exist efficiently without the other is an important question that has been raised in the literature and is surrounded by far more controversy than the question of the desirability of an EP strategy in trade.

Why Does an Export-Promoting Strategy Aid Development?

With the EP strategy defined in terms of the incentive structure, the substantive conclusion that has emerged from the major research projects listed earlier is that the economic performance of the EP countries has been remarkably strong, although they had no one rooting for their success when development efforts were being initiated in the early 1950s. Here, as elsewhere, history has turned up surprises.

In evaluating this outcome, we have to distinguish between two questions: (a) why should the EP strategy have been helpful in accelerating economic development, and (b) could the acceleration have been caused by factors other than the EP strategy?

The Evidence

The serious evidence on the successful impact of the EP strategy on economic performance, as measured by an improved growth rate, has to be found in the country studies of the research projects on trade and development (listed earlier). Among these, the most compelling evidence is in the analyses in the NBER project where the EP strategy was carefully defined and transitions to it from an IS strategy by various phases were systematically investigated.[17]

There is also much cited evidence that relates largely to associations between growth rates of exports and growth rates of income, as in the work of Michaely (1977) who used data for 1950–73 for forty-one countries, and the further extension of this type of work by Balassa (1978) and Feder (1983).[18] Complementing this approach is the altogether different statistical formulation in Michalopoulos and Jay (1973). This study takes a very different approach to the problem by using exports as an argument in estimating an economywide production function from aggregate output and factor use data. Using data for thirty-nine countries this study argued that exports are an independent input into national income.[19]

Neither the Michaely-Balassa-Feder nor the Michalopoulos-Jay findings, however, bear directly on the question whether the EP strategy is productive of more growth, because the incentive-related EP

strategy is not the one used to examine the question of income or growth performance. It is necessary to identify whether the superior export growth rates (or higher export magnitudes) belong to the EP countries.

This is particularly worrisome since high growth rates of exports may have been caused by high growth rates of output (which, in turn, may have resulted from other exogenous factors such as a higher savings effort), rather than the other way around. Thus, if IS does not parametrically reduce trade greatly, it is conceivable that this reverse causation could lead the rapidly expanding countries, whether EP or IS, to show higher export growth rates than less rapidly expanding economies.

Hence, while these cross-country regressions are certainly interesting, valuable and suggestive, they cannot be considered compelling on the issue in question, especially as they (and conclusions based on them) are likely to be critically dependent on the period, sample of countries, and variables chosen. By contrast, the detailed country studies are methodologically superior and more persuasive. And, as noted already, they do indicate the superiority of the EP strategy.

The Reasons

Economists have been preoccupied with the reasons why the IS strategy has been generally dominated by the EP strategy, and why the countries that rapidly made the transition from the former to the latter have done better. The following hypotheses have been advanced, based on the usual mix of analytical insights, casual empiricism, and econometric evidence.[20]

Resource Allocation Efficiency. The first set of reasons for the success of the EP strategy relies on the fact that it brings incentives for domestic resource allocation closer to international opportunity costs and hence closer to what will generally produce efficient outcomes. This is true, not merely in the sense that there is no bias against exports and in favor of the home market (that is, $EER_x \approx EER_m$) under the EP strategy, but also in the sense that the IS countries seem to have generally had a chaotic dispersion of EERs among the different activities within export and import-competing activities as well. That is, the degree of IS goes far and the pattern of IS reflects widely divergent incentives. By contrast, the EP strategy does better both on degree (since $EER_x \approx EER_m$) and on pattern.

Why is the degree of bias so large and the pattern wrong under IS? The answer seems to lie in the way in which IS is often practiced and in the constraints that surround EP. Thus IS could, in principle, be contained to modest excess of EER_m over EER_x. But typically IS arises in the context of overvalued exchange rates and associated exchange

controls. So there is no way in which the excess of domestic over foreign prices is being tracked by government agencies in most cases, and the excesses of EER_m over EER_x simply go unnoticed. The non-transparency is fatal. By contrast, EP typically tends to constrain itself to rough equality, and ultra-EP also seems to be moderate in practice, because policy-induced excesses of EER_x over EER_m often require subsidization that is constrained by budgetary problems.

In the same way, the pattern of EER_m can be terribly chaotic because exchange controls and QRs on trade will typically generate differential premiums and hence differential degrees of implied protection of thousands of import-competing activities. By contrast, the EP strategy will typically unify exchange rates, which avoids these problems and, when it relies on export subsidization, will be handled both with necessary transparency and with budgetary constraints that would then prevent wide dispersions in EERs.

The chaotic nature of differential incentives among diverse activities in IS regimes has been documented by estimates of effective rates of protection (ERPs) (though these estimates can be misleading in quantitative restrictions regimes where the import premiums may reflect effects of investment controls, indicating therefore resource denial rather than resource attraction to the high-premium and therefore, other things being equal, the high-ERP activities. The estimates of cross-sectional domestic resource costs (DRCs), which provide instead a guide to differential social returns to different activities, have also underlined these lessons. The conceptual and measurement analyses of several distinguished economists, including Michael Bruno, Max Corden, Harry Johnson, and Anne Krueger, have contributed greatly to this literature.

Directly Unproductive Profit-Seeking and Rent-Seeking Activities. Yet another important aspect of the difference between EP and IS strategies is that IS regimes are more likely to trigger what economic theorists now call directly unproductive profit-seeking (DUP) activities (Bhagwati 1982b). These activities divert resources from productive use into unproductive but profitable lobbying to change policies or to evade them or to seek the revenue and rents they generate.[21] Rent-seeking activities (Krueger 1974), where lobbies chase rents attached to import licenses and other quantitative restrictions, are an important subset of such DUP activities. The diversion of entrepreneurial energies and real resources into such DUP activities tends to add to the conventionally measured losses from the high degree and chaotic pattern of IS.[22]

It must be admitted that, although economists have now begun to make attempts at estimating these costs, they are nowhere near arriving at plausible estimates simply because it is not yet possible to estimate realistically the production functions for returns to different

kinds of lobbying. But, as Harrod once remarked, arguments that cannot be quantified are not necessarily unimportant in economics, and the losses arising from DUP and rent-seeking activities seem presently to illustrate his observation.[23]

Foreign Investment. If IS regimes have tended to use domestic resources inefficiently in the ways that were just outlined, the same applies to the use of foreign resources. This is perhaps self-evident, but substantial theoretical work by Bhagwati (1973), Brecher and Diaz-Alejandro (1977), Uzawa (1969), Hamada (1974), and others has established that foreign investment that comes in over QRs and tariffs—the so-called tariff-jumping investment—is capable of immiserizing the recipient country under conditions that seem uncannily close to the conditions in the IS countries in the postwar decades. These conditions require capital flows into capital-intensive sectors in the protected activities. It is thus plausible that, if these inflows were not actually harmful, the social returns on them were at least low compared with what they would be in the EP countries where the inflows were not tariff-jumping but rather aimed at world markets, in line with the EP strategy of the recipient countries.

In addition, I have hypothesized (Bhagwati 1978 and 1986a) that, other things being equal, foreign investments into IS countries will be self-limiting in the long run because they are aimed at the home market and therefore constrained by it. If so, and there seems to be some preliminary evidence in support of this hypothesis in ongoing econometric analysis,[24] then IS countries would have been handicapped also by the lower amount of foreign investment flows and not just by their lower social productivity compared with the EP countries.

Gray Area Dynamic Effects. Although the arguments so far provide ample satisfaction to those who seek to understand why the EP strategy does so well, dissatisfaction has continued to be expressed that these are arguments of static efficiency and that dynamic factors such as savings and innovations may well be favorable under an import-substituting trade strategy.

Of course, if what we are seeking to explain is the relative success of the EP countries with growth, this counterargumentation makes little sense since, even if it were true, the favorable effects from these "gray area" sources of dynamic efficiency would have been outweighed in practice by the static efficiency aspects. But the counterargumentation is not compelling anyway. Overall, it is not possible to claim that IS regimes enable a country to save more or less than EP regimes: the evidence in the NBER project, for instance, went both ways. Nor does it seem possible to maintain that EP or IS regimes are necessarily more innovative. It is possible to argue that EP regimes may lead to more competition and less-sheltered markets and hence

more innovation. But equally, Schumpeterian arguments suggest that the opposite might also be true.[25]

The few recent studies that have appeared do suggest that the EP strategy may encourage greater innovation. Krueger and Tuncer (1980) examined eighteen Turkish manufacturing industries during the 1963–76 period. They found that periods of low productivity growth roughly occurred during periods when foreign exchange controls were particularly restrictive and hence the IS strategy was being accentuated. The overall rate of productivity growth was also low throughout the period during which Turkey pursued an IS strategy. In an analysis of productivity change in Japan, Korea, Turkey, and Yugoslavia, Nishimizu and Robinson (1984) argue that if growth is decomposed into that due to "domestic demand expansion," "export expansion," and "import substitution," the interindustrial variation in factor productivity growth reflects (except for Japan) the relative roles of export expansion and import substitution, the former causing a positive impact and the latter a negative one. However, as the authors recognize, export expansion may have been caused by productivity change rather than the other way around, the regressions begging the issue of causality.

What is the influence of economies of scale in EP and IS regimes? Theoretically, the EP success should be increased because world markets are certainly larger than home markets. But, systematic evidence is not yet available on this question. For instance, evidence is lacking to indicate whether firms that turn to export markets are characterized by greater scale of output than those firms that do not. Experience in the case of the EC suggests that trade may lead not to changes in the level of output so much as to product specialization.

Suppose however that we do assume that economies of scale will be exploited when trade expands. The cost of protection, or the gains from trade, will then rise significantly. Harris (1986) has calculated for Canada that a 3.6 percent rise in GNP could follow from the unilateral elimination of Canadian tariffs, if the economies of scale are fully exploited.

Finally, in the matter of *X*-efficiency, it is again plausible that firms under IS regimes should find themselves more frequently in sheltered and monopolistic environments than those under EP regimes; a great deal of such evidence is available from the country studies in the several research projects discussed. *X*-efficiency therefore ought to be greater under the EP regime. However, as is well known, this is a notoriously gray area where measurement has often turned out to be elusive.

Although the arguments for the success of the EP strategy based on economies of scale and *X*-efficiency are plausible, empirical support for them is not available. The arguments on savings and innovation

provide a less than compelling case for showing that EP is necessarily better on their account than IS.

Growth and Other Objectives

A final word is necessary on the superior economic performance of the EP strategy. Much like the die-hard monetarists who keep shifting their definitions of money as necessary in order to keep their faith, the proponents of IS have tended to shift their objections as required by the state of the art.

When it became evident that the EP strategy yielded higher growth and that the static versus dynamic efficiency arguments were not persuasive and probably went in favor of the EP strategy, the IS proponents shifted ground. They took to arguing that the objective of development was not growth but the alleviation of poverty or unemployment and that EP might be better for growth but was worse for these other objectives. This was part of a larger argument that became fashionable during the 1970s in certain development circles: that growth had been the objective of development to date; that the objective was wrong; that the true objective of poverty amelioration was ill served by development efforts directed at growth; and that growth even harmed (in certain formulations of such critics) the poor.

The evidence does not support the views that growth was desired in itself, that poverty elimination was not a stated objective which was pursued by the acceleration of growth rates to "pull up" the poor into gainful employment, and that growth on a sustained basis has not helped the poor. These orthodoxies are no longer regarded as plausible, as I have argued at length elsewhere.[26]

In regard to the narrower question at hand, that is, whether the EP strategy procures efficiency and growth but adversely affects poverty and employment, evidence has now been gathered extensively in a sequel NBER project, directed by Krueger (1982). Essentially, she and her associates document how investment allocation under EP requires the expansion of labor-intensive activities, because developing country exports are typically labor-intensive. Therefore, EP strategies tend to encourage the use of labor and hence the growth of employment and the alleviation of poverty in countries that typically have underemployed labor.

Moreover, after more than two decades of successful growth in the EP regimes, especially in the four Far Eastern economies, it has become easier for economists to contemplate and comprehend the effects of compound rates and the advantages of being on rapid escalators. Even if it had been true that the EP strategy yielded currently lower employment or lower real wages, the rapid growth rates would overwhelm these disadvantages in the time of simply one generation. It

would appear therefore that both the employment-intensive nature of EP growth in developing countries and the higher growth rates in the EP countries have provided a substantial antidote to the poverty and underemployment that afflicted these countries at the start of their development process.

The Second Export Pessimism

These lessons were important. Many developing countries learned them the hard way: by following IS policies too long and seeing the fortunate few pursuing the EP strategy do much better. Perhaps learning by others' doing and one's own undoing is the most common form of education!

But just as these lessons were widely accepted, and a "new orthodoxy" in their favor was established, a new wave of export pessimism arrived on the scene. This second export pessimism, which is paradoxically both more serious and more tractable in principle, tends to undermine the desired shift to the EP strategy in the developing countries.

There are two sets of factors generating this pessimism: (a) objective events such as the slowing down of the world economy since the 1970s and the resurgence of powerful protectionist sentiments in the industrial countries, and (b) new intellectual and academic arguments in support of inward-looking trade policies in the developing countries. The two are not entirely unrelated since theory, especially international trade theory, does not grow in a vacuum. But they can be dealt with sequentially nonetheless.

In essence, the second export pessimism rests on the view that, whatever the market-defined absorptive capacity for the exports of the developing countries, the politics of protectionism in the industrial countries (which still constitute the chief markets of developing country exports) is such that the exports from developing countries face serious and crippling constraints that make the pursuit of an EP strategy (with $EER_x \approx EER_m$) inefficient, if not positively foolish.

If this assessment is correct, then the EP strategy's premise that foreign markets are available at prices largely independent of one's own exports is certainly not valid. But this must be correctly understood. If Brazil successfully exports footwear, for example, and the importing countries invoke market-disruption-related QRs, or frivolous countervailing duty (CVD) retaliation, then Brazil faces a less than perfectly elastic market for footwear, and an optimal tariff (that is, a shift to IS strategy) *in this sector* is called for. This should justify only selective protection, carefully devised and administered, not a general IS strategy. If, however, this response is feared no matter what is exported, that is, the fear of protectionism is nearly universal in scope, a generalized shift to IS strategy unfortunately would be appropriate.

The second pessimism, like the first, takes the latter, vastly more fearsome form, extending to exports generally. The resulting case for a general shift to the IS strategy then collapses only if the protectionist threat can be shown to be less serious than it appears or if the threat, even though serious, can be contained by multilateral efforts or other policy options that ought to be undertaken along with the EP strategy. As it happens, a case can be made in support of both these responses.

How Serious Is the Protectionist Threat?

In assessing the extent to which the protectionist threat must be taken seriously, one may first make the prudential statement that it should never be regarded lightly. Sectional interests have always provided the political momentum through congresses and parliaments to protectionist responses to import competition. The postwar history of trade barriers also shows, however, the important role that executive branches have played in upholding the national interest, broadly served by freer trade and specialization. The real question is: has the threat become sufficiently more serious so that the developing countries ought to turn away from embracing the EP strategy?

First, a few facts need to be noted. As table 1 briefly indicates, trade expansion has certainly slowed considerably since the 1970s. But even so, world trade has grown faster than world income during the 1970–83 period. More compelling is the fact that the developing countries' exports of manufactures to the industrial countries have grown almost twice as fast as the exports of these countries to one another, showing even during the 1970s a growth rate of more than 8 percent annually. This has happened during a period when nontariff barriers (NTBs), such as voluntary export restraints (VERs), began to proliferate and when the OECD countries showed sluggish growth rates and increased unemployment.

That exports from the developing countries continued to grow in this fashion was first highlighted by Hughes and Krueger (1984) who thought that it was a puzzle since a large amount of actual protection seemed to have already been adopted. This puzzle has stimulated Baldwin (1982 and 1985) into developing an interesting thesis: that protection is far less effective than one thinks simply because there are many ways in which exporting countries can get around it in continuing to increase their export earnings. Thus, Baldwin has written:

> Consider the response of exporting firms to the imposition of tighter foreign restrictions on imports of a particular product. One immediate response will be to try to ship the product in a form which is not covered by the restriction... One case involves coats with removable sleeves. By importing sleeves unattached, the rest of the coat comes in as a vest, thereby qualifying for more favorable tariff treatment...

> The use of substitute components is another common way of getting around import restrictions. The quotas on imports of sugar into the United States only apply to pure sugar, defined as 100 percent sucrose. Foreign exporters are avoiding the quotas by shipping sugar products consisting mainly of sucrose, but also containing a sugar substitute, for example, dextrose... At one time, exporters of running shoes to the United States avoided the high tariff on rubber footwear by using leather for most of the upper portion of the shoes, thereby qualifying for duty treatment as leather shoes" (1985, p. 110).

Yoffie (1983) has also recently examined the VERs on footwear and textiles from a political scientist's perspective and found that the dynamic exporting economies such as Korea and Taiwan have embraced them with considerable ingenuity, much like what Baldwin has documented, to continue expanding their exports significantly.

There is also a more subtle factor at play here which relates to why VERs may have provided the mechanism by which the executive branches of government interested in maintaining freer trade may have succeeded in keeping trade expanding. VERs are, in that view, a "porous" form of protection that is deliberately preferred because of this nontransparent porousness. I have argued recently (Bhagwati 1986b) that in industries such as footwear, two characteristics seem to hold that lend support to this porous protection model as an explanation for why protection is ineffective: (a) undifferentiated products (that is, cheaper varieties of garments and footwear) make it easy to "transship," that is, to cheat on rules of origin, passing off products of a country restricted by VERs as products of countries not covered by VERs; and (b) low start-up costs and therefore small recoupment horizons apply in shifting investment and hence products to adjacent third countries that are not covered by VERs, so that an exporting country can get around (admittedly at some cost) the VERs by "investment-shunting" to sources unafflicted by VERs. This strategy allows the exporter to recover his investment costs, since it is usually some time before the VERs get around to covering these alternative sources, or VERs are eliminated as the political pressure subsides (as was the case with U.S. footwear).[27]

In both ways, therefore, VERs in these types of industries can yield a "close-to-free-trade" solution for the exporting countries. These countries can continue to profit from their comparative advantage by effectively exploiting, legally (through investment-shunting) and illegally (through transshipments), the fact that VERs leave third countries out whereas importing country tariffs and quotas do not.[28]

But the question then arises: why would the protecting importing countries prefer this porous protection? Does it not imply that the

market-disrupted industry fails to be protected as it would under a corresponding import trade restraint? Indeed it does. But that is precisely its attractiveness.

If executive branches want free trade in the national interest whereas legislatures respond to the sectoral interests—definitely the stylized description of the "two-headed" democracies in the United States and the United Kingdom—then it can be argued that executives will prefer to use a porous form of protection which, while ensuring freer market access, will nonetheless manage to appear as a concession to the political demands for protection from the legislature or from their constituencies. Undoubtedly, these protectionist groups and their congressional spokesmen will eventually complain about continuing imports. But then the executive branch can always cite its VER actions, promise to look into complaints and perhaps bring other countries into the VER net, and continue to obfuscate and buy time without effectively protecting.[29]

If the foregoing arguments suggest that executives have been clever enough, both in exporting and importing countries, in keeping markets much more open than the casual reading of the newspapers would suggest, there are also additional forces in favor of freer trade that have now emerged in the world economy which need to be considered in making a reasonable assessment of the prospects for increased protectionist measures. I believe that the international political economy has changed dramatically in the last two decades to generate new and influential actors that are supportive of freer world trade.

A fairly common complaint on the part of analysts of the political economy has been the asymmetry of pressure groups in the tariff-making process. The beneficiaries of protection are often concentrated, whereas its victims tend to be either diffused (as is the case with final consumers) or unable to recognize the losses they incur (as when protection indirectly affects exports and hence hurts those engaged in producing exportables).[30]

Direct foreign investment (DFI) and the growing maze of globalized production have changed this equation perceptibly. When DFI is undertaken, not for tariff-jumping in locally sheltered markets, but for exports to the home country or to third markets, as is increasingly the case, protectionism threatens the investments so made and tends to galvanize these influential multinationals into lobbying to keep markets open. For example, it was noticeable that when the U.S. semiconductor suppliers recently gathered to discuss antidumping legal action against Japanese producers of memory microchips known as EPROMs (or erasable programmable read-only memories), noticeably absent were Motorola Inc. and Texas Instruments Inc. who produce semiconductors in Japan and expect to be shipping some back to the United States.[31]

Almost certainly a main reason why U.S. protectionism has not translated into a disastrous Smoot-Hawley scenario, despite high unemployment levels and the seriously overvalued dollar (in the Dutch Disease sense), is that far fewer congressmen today have constituencies where DFI has not created such protrade, antiprotectionist presence, muddying waters where protectionists would have otherwise sailed with great ease. The "spiderweb" phenomenon resulting from DFI that criss-crosses the world economy has thus been a stablilizing force in favor of holding the protectionists at bay.

It is not just the DFI in place that provides these trade-reinforcing political pressures.[32] The reaction against import competition has been diluted by the possibility of using international factor mobility as a policy response. Thus, the possibility of undertaking DFI when faced with import competition also provides an alternative to a protectionist response. Since this is the capitalist response, rather than a response of labor to "losing jobs abroad," the defusion of the protectionist threat that is implied here works by breaking the customary alliance between capital and labor within an industry in their protectionist lobbying, a relationship with which Magee has made us long familiar.

Labor today seems also to have caught on to this game and is not averse to using threats of protection to induce DFI from foreign competitors instead. The United Auto Workers labor union in the United States appears to have helped to induce Japanese investments in the car industry. This is quite a generic phenomenon where DFI is undertaken by the Japanese exporting firms to buy off the local pressure groups of firms or unions that threaten legislative pressures for tariffs to close the import markets. This type of induced DFI has been christened "quid pro quo DFI" (Bhagwati 1985c) and appears to be a growing phenomenon (certainly on the part of Japanese firms), representing a new and alternative form of response to import competition than provided by old-fashioned tariff-making.[33]

In short, both actual DFI (through the spiderweb effect) and potential DFI (outward by domestic capital and quid pro quo inward by foreign capital) are powerful forces that are influencing the political economy of tariff-making in favor of an open economy. They surely provide some counterweight to the gloom that the protectionist noises generate today.

But all these arguments could collapse under the weight of the contention that if many countries were indeed to shift to the EP strategy, whether through conversion to the view or through conditionality such as that envisaged under the plan put forth by U.S. Treasury Secretary James Baker III in 1985, the pressures to close markets would multiply owing to the magnitude of the absorption of exports that this would imply for the industrial countries.

This takes us back partly to the Cline (1982) estimates and the

several refutations of the pessimism engendered by them that were set out earlier.[34] But it remains true that, even if the estimates in Cline are not to be taken seriously, the addition of any kind of trade pressure in a significant degree could touch off a wider range of sectoral, safeguard moves in the industrial countries in the present climate. It is indeed possible to argue that (a) Cline-type estimates are not plausible and exaggerate what would happen; (b) there is a great deal of absorptive capacity in the market sense in the world economy which can readily handle improved export performance resulting from the shift of many developing countries to the EP mode of organizing trade; and (c) there are powerful new forces in the international political economy that may make the protectionist bark worse than the protectionist bite. Nonetheless, the danger of protectionism does remain acute, especially in the present macroeconomic situation of sluggish growth and the continuing trade deficit in the United States. The capacity of the U.S. executive branch to hold the line against protectionism has been significantly eroded by the neglect of fiscal deficits and the upsurge in congressional support for protection and fair trade. The fragility of the situation requires serious attention to other policy instruments such as the multinational trade negotiations (MTN), as discussed below.

An important consequence of the second wave of export pessimism, which is based on this protectionist threat rather than on the belief in market-determined forces that limit export prospects, is that developing countries can join in the process of trying to contain this threat and thereby change the very prospects for their trade. This suggests that they join hands with the industrial countries in efforts such as the MTN to contain the threat to the world trading system and to keep markets open to expanding trade levels. Shifting to the IS strategy, therefore, based on export pessimism reflecting protectionist sentiments simply makes no sense from an economic viewpoint unless the developing countries are convinced that protectionism is here to stay and will be translated into actuality no matter what is done—an assumption that seems to be wholly unwarranted in light of the discussion earlier in this section. A far more sensible policy approach seems rather to be to join with the executives of countries that support freer trade initiatives, among them certainly the United States, in containing the protectionist sentiments through strategies such as entering into trade negotiations.

New Arguments for the IS Strategy

It may be useful to address some new intellectual defenses of the IS strategy that have recently emerged in the academic literature.[35]

Labor Market Imperfections. In recent articles, especially Fields (1984), it has been argued that the EP strategy is not appropriate when

there are excessively high wages in the economy and that EP countries such as Jamaica have done badly by ignoring this caveat. Now, the theoretical literature on market imperfections and optimal policy that emerged in the postwar period, with the independent contributions by Meade (1951) and Bhagwati and Ramaswami (1963) setting off the spectacular growth of the subject during the 1960s, has shown that factor market imperfections are best addressed by domestic, rather than trade, taxes and subsidies.[36] It is true, however, that the second-best policy measures in such a case could be trade tariffs and subsidies.

There are two other problems with Fields's argument. First, he does not establish that countries such as Jamaica have been following the EP strategy in the incentive-related sense that is relevant. As it happens, Jamaica certainly has not and has for long periods been in the IS mode instead. This confusion of concepts and hence conclusions is not confined to Fields's analysis, but afflicts even the proponents of EP strategy in some cases. Second, it is not at all clear from Fields that the high wages constitute a market imperfection in the sense required for departure from unified exchange rates in the form of the IS strategy.

In my view, wages are relevant in a different sense that is macrotheoretic, rather than microtheoretic as Fields suggests. If overall wages are "too high," that can only mean that somehow they, and therefore the price level as well, are out of line with the exchange rate. That is, the country is suffering from overvaluation. In short, if that is so, we have already seen that the country is pursuing an IS strategy, whether it intends to or not. Therefore, a country simply cannot hold on to any EP strategy if it continues to experience excessive wages. The sustained pursuit of EP, so that investors respond to the incentives that EP defines, thus requires a sound macro policy as its foundation. Sound macro policies may then also bring, in turn, their own other rewards that supplement those that follow from the export-promoting strategy.

Satisficing Theory of IS. An interesting thesis has been proposed by the political scientist Ruggie (1983), which seems to argue that the advantage of an EP strategy cannot be enjoyed by many developing countries because they simply do not possess the flexibility of resource movements and the necessary political capacities to manage such flexibility that the pursuit of EP requires. I would call this therefore the "satisficing" theory of the IS strategy: developing countries in this predicament must make do without the gains from trade and efficiency improvements that EP strategy brings.

This is a difficult argument to judge since, even if it were valid within its premises, I do not find it compelling if such political constraints are equated with the fact of being less developed economically. In fact, given the lack of democratic structures with pressure group politics and attendant constraints on economic action by the

government, it is doubtful whether developing countries are not the ones at advantage in this matter!

Again, is it clear that tensions and distributional conflicts are necessarily more difficult under an EP strategy? An IS strategy, while insulating the economy relatively from external disturbances, may create yet more tensions and conflicts if the resulting stultification of income expansion accentuates the zero-sum nature of other policy options in the system. The correct statement of the Ruggie thesis would then seem to be that, in the pursuit of any development strategy, the compatibility of it with the political structure and resilience of the country needs to be considered. And this caveat needs to be addressed not only to the EP proponents.

Coping with External Instability. A similar economic concern has been that, while EP may be better under steady-state conditions, it exposes the economy to the downside in the world economy and makes it more vulnerable to instability.

Of course, the downside effects have to be set off against the upside effects. When this is done, it is not evident that countries pursuing EP strategies are necessarily worse off. As it happens, even the downside experience of EP strategy countries during the years after the oil shock seems to have been more favorable than the experience of the IS strategy countries, according to statistical analysis by Balassa (1983 and 1984). The reason seems to have been their greater capacity to deal with external adversity by using export expansion more successfully to adapt to the world slowdown and thus avoiding import contraction.

Conclusion

Export promotion policies emerge with success from the detailed scrutiny offered in this article. Equally important is the fact that their successful adoption will require collaborative and intense efforts to ensure that the protectionist threat, recently escalating, is not allowed to break out into actual protection on a massive scale.

The multilateral trade negotiations offer the only reasonable prospect for maintaining a momentum in favor of a freer world trading system. Failure to pursue them successfully, in a spirit of accommodation and mutual understanding of constraints and needs, will only undermine what seems like the best mechanism for containing the protectionist threat.

Appendix: Theoretical Clarification of Key Concepts

Definitions

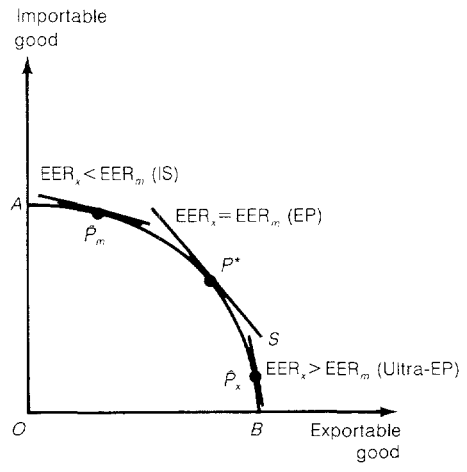
Figure 1 illustrates, in the two-good model, the definitions of the export-promoting (EP), import-substituting (IS), and ultra–export-promoting (ultra-EP) trade strategies.

AB is the country's production possibility curve. With given international prices P^*S, equilibrium production would be reached at P^* under unified exchange rates which ensure that the relative goods prices domestically are equal to P^*S. Therefore, at P^*, we have $\text{EER}_x = \text{EER}_m$, where EER refers to the effective exchange rate. This is defined as the EP strategy.

When the incentive to produce the import-competing good exceeds that to produce the exportable good, because of a tariff or overvalued exchange rates, for example (as shown below), production shifts to $\hat{P}_m$. Here, $\text{EER}_x < \text{EER}_m$. This is the IS strategy.

If the biased incentive goes in the other direction, the relative incentives imply $\text{EER}_x > \text{EER}_m$ and production shifts to the right of P^*, to say $\hat{P}_m$. This is defined as the ultra-EP strategy.

Figure 1

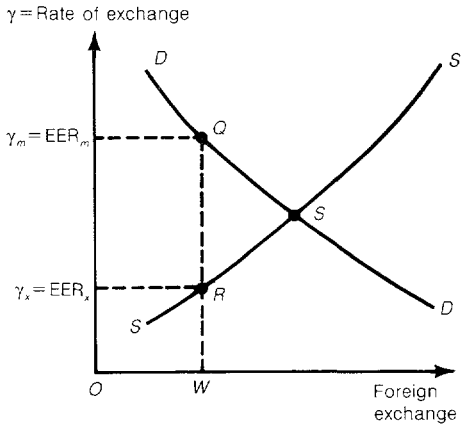


Overvalued Exchange Rates and IS Strategy

An overvalued exchange rate will imply the pursuit of the IS strategy. Figure 2 demonstrates this with the standard supply and demand diagram for foreign exchange.

If the exchange rate is adjusted to clear the market, at *S*, then $\text{EER}_x = \text{EER}_m$ because an identical parity applies to both export and import transactions. But consider now an overvalued exchange rate with exchange controls in place. Under these circumstances the overvalued exchange rate γ_m leads to *OW* foreign exchange being earned, corresponding to *R* on the *SS* curve. This foreign exchange will then be rationed to users, fetching a market-determined price which exceeds γ_x. That price is determined by *Q* on the *DD* curve, with γ_m representing then the price corresponding to quantity *OW*. Evidently then, $(\gamma_m - \gamma_x)/\gamma_x$ represents the rate of premium that scarce foreign exchange commands in this overvalued exchange rate system.

Figure 2

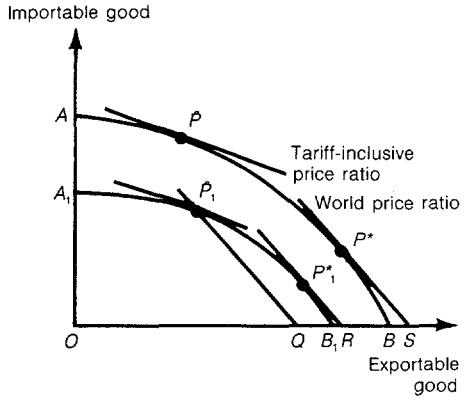


It is also evident that $\gamma_x = \text{EER}_x$ and $\gamma_m = \text{EER}_m$ and therefore $\text{EER}_x < \text{EER}_m$ by the magnitude of the premium on rationed foreign exchange. The overvalued exchange rate therefore implies the pursuit of an IS strategy, whether it is intended or not.

The Cost of Protection with Tariff-Seeking

The new theory of directly unproductive profit-seeking (DUP) and rent-seeking activities, which incorporates lobbying and related policy-triggered and policy-influencing activities into formal economic theorizing, is illustrated in figure 3 by reference to the phenomenon of tariff-seeking lobbying.

Figure 3



AB is the production possibility curve if there is no tariff-seeking activity. If, as in conventional analysis, we assume an exogenously specified tariff, equilibrium production shifts to $\hat{P}$ (where, of course, $\text{EER}_x < \text{EER}_m$).

Suppose now that this very tariff is instead arrived at by lobbying which uses up real resources, diverting these resources from being productively employed in producing the two goods. Then, the resources that are available to produce the two goods in this endogenous tariff, or equivalently tariff-seeking, equilibrium can be hypothetically seen to result in a "net-of-tariff-seeking" production possibility curve A_1B_1 at $\hat{P}$.

The total cost of protection is *QS*, measured in the conventional equivalent variation fashion. By putting the given world price ratio tangent to *AB* at $\hat{P}^*$, we can then decompose this total cost of protection as follows: $QS = QR + RS$ where *QR* is the conventional cost of protection (but measured along the net curve *AB*) and *RS* is the additional cost of tariff-seeking (representing the cost of diverting resources from productive use to tariff-seeking lobbying).[37]

Abstract

This article evaluates recent arguments against the adoption of an export-promoting (EP) trade strategy. It reviews past experience with trade strategies, and distinguishes between the old and new export pessimism. The former was based on an (unwarranted) assessment of "natural" or market forces. The latter, by contrast, reflects "man-made" protectionism. This review finds that an EP policy remains the preferred option provided developing countries forcefully join with the industrial countries in strategies to contain protectionist threats and to preserve and expand an open trading system.

Notes

Thanks are due to Armeane Choksi, Martin Wolf, Constantine Michalopoulos, Sarath Rajapatirana, Swaminathan Aiyar, Mohsin Khan, Vittorio Corbo, Adrian Wood, and Bela Balassa for helpful comments and to Sunil Gulati, Susan Hume, Douglas Irwin, and David Laster for research assistance.

1. The chief studies were directed by Little, Scitovsky, and Scott (1970) at the Organisation for Economic Co-operation and Development (OECD), Balassa (1971) at the World Bank, Bhagwati (1978) and Krueger (1978) at the National Bureau of Economic Research (NBER) in the United States, and Donges (1976) at the Kiel Institute in Germany. Complementing and overlapping each other, these studies represent a

comprehensive analysis of the central question that has preoccupied development economists from the very beginning of the discipline.

2. Among other reviews that complement this article, the reader may consult Behrman 1984, Bhagwati and Srinivasan 1979, Findlay 1984, and Srinivasan 1986a and 1986b.

3. Prebisch may have subsequently embraced the Nurkse view that primary product markets were also price inelastic, according to Balassa. I refer here to the main Prebisch thesis as originally propounded and widely attributed to him.

4. In technical jargon, we have here the classic case for an optimal tariff since the terms of trade vary with the level of trade.

5. This is an example of the dangers of using such regressions, with little underlying rationale, for predictive purposes. I have considered this issue at great length (Bhagwati 1985a, p. 2).

6. Compare Goldstein and Khan (1982) and Riedel (1984), who analyze this argument fully in two splendid and independent articles. Also of importance is the classic examination of the issue by Kravis (1970).

7. See again the results cited in the synthesis volumes of the research projects listed in note 1. The Goldstein-Khan (1982) analysis also bears directly on this issue.

8. Compare Riedel's (1984) discussion of this finding in table 4.

9. There is a substantial empirical literature on this subject, with important contributions by Balassa, Grubel, and Lloyd. In addition, recent theoretical work by Dixit, Lancaster, Krugman, Helpman, and others has provided the analytical explanation for such intraindustry trade.

10. All these arguments are effectively a rebuttal of Dornbusch's (1986) restatement of the limited absorptive capacity thesis for developing country exports, which asserts that substantial terms of trade losses would follow from the simultaneous resort to EP strategy by many developing countries.

11. I am indebted to Vittorio Corbo for pointing this out to me.

12. Compare the comment on Prebisch in Bhagwati (1985a).

13. The estimated excess of EER_x over EER_m appeared to be below 10 percent at maximum in the few careful cross-section estimates we had. This is reconfirmed for Korea in a more recent analysis by Nam (1986).

14. The strategies have been illustrated in the simplified two-goods model of traditional trade theory in figure 1 in the appendix.

15. See also Krueger's (1980) informal usage of the phrase in this fashion.

16. Compare Chenery, Shishido, and Watanabe (1962) for one such decomposition. For an analytical synthesis and evaluation of alternative measures of import substitution, see Desai (1979).

17. See, in particular, the synthesis volumes by Bhagwati (1978) and Krueger (1978).

18. Krueger's (1978) synthesis volume also contains similar cross-country regressions for the ten semi-industrialized countries in the NBER project. See the extensive review in Lal and Rajapatirana (1987).

19. Balassa's (1978) reestimation of Michaely-type regressions also incorporates the Michalopoulos-Jay approach, thus combining the two different methodologies under one rubric.

20. It is well known, of course, that factors that lead to improved efficiency and hence to income improvement need not necessarily lead to sustained higher growth rates. Thus, in the Harrod-Domar model, where labor supply is slack, a once-for-all improvement in efficiency will indeed translate into a permanent higher growth rate of income, but not so in the steady state in the Solow model, where the growth rate is determined

by the growth rate of labor and the rate of technical change. In the text, however, we are explaining growth rates over a period of two or three decades, which makes these subtleties not particularly relevant, in my judgment. Moreover, it is important to note that, for any given growth rate, a more efficient economic regime will require less savings (and hence less blood, sweat, and tears) to sustain it than a less efficient economic regime.

21. See Bhagwati and Srinivasan (1983, p. 30) for a taxonomy of such lobbying activities.

22. The appendix to this article explains the manner in which the conventional cost of distorted production decisions resulting from protection is augmented by the cost of tariff-seeking lobbying when the protective tariff is the result of such lobbying. Costs of other kinds of lobbying, including the effects of DUP activities such as illegal trade (that is, tariff evasion), can be similarly illustrated. If the EP strategy relies not on exchange rate flexibility but simply on selective export subsidies to eliminate the bias against exports (as in Phase II, delineated in the Bhagwati-Krueger NBER project), the DUP activities can be expected to arise extensively in that regime as well.

23. Krueger's (1974) classic article contains estimates of rent-seeking costs, that is, resources spent in chasing premiums or rents on quantitative restrictions. These high estimates, up to 15 percent of GNP, are based on the assumption that rents result in an equivalent loss of resources in equilibrium (the so-called one-on-one postulate in rent-seeking theory). Recently, computable general equilibrium models have begun to incorporate such DUP and rent-seeking activities, so that progress can be expected in assessing the magnitude of such costs. Compare Dervis, de Melo, and Robinson (1981) and Grais, de Melo, and Urata (1986).

24. See the discussion in Balasubramanian (1984) and in Bhagwati (1986a). In private communication, Balasubramanian has provided further results in support of this hypothesis.

25. See Bhagwati (1978), where some chapters summarize and evaluate these arguments with evidence from the ten country studies.

26. See Bhagwati (1985d) where I review the arguments and the evidence on these issues, drawing also on the valuable contributions of Surjit Bhalla, Pranab Bardhan, Paul Isenman, Ian Little, Irma Adelman, Montek Ahluwalia, Keith Griffen, Paul Streeten, and T. N. Srinivasan, among others.

27. The investment shunting need occur only insofar as it is necessary to meet value-added rules of origin, of course, making the cost of profiting from this porousness even less than otherwise.

28. Of course, the VERs in this instance represent only a partial and suboptimal approximation to the free trade solution, which remains the desirable but infeasible alternative. Moreover, not all exporting countries are capable of the flexible and shrewd response that underlies the model of porous protection sketched above.

29. This "two-headed" version of governments is what underlies the Feenstra-Bhagwati (1982) model of the efficient tariff. There, the model postulates that one branch of the government (pursuing special interests) interacts with a protectionist lobby to enact a political economy tariff. Then, another branch of the government (pursuing the national interest) uses the revenue generated by this tariff to bribe the lobby into accepting a less harmful tariff that nonetheless leaves it as well off as under the political economy tariff. When this model was presented to a scientific conference in 1978, the general reaction was that the model had a "schizophrenic" two-headed government! Traditional trade theory is so often modelled in terms of a monolithic government that what was obviously a realistic innovation was regarded as a bizarre feature of the model.

30. See, for example, Olson (1971), Finger (1982), and Mayer (1984).

31. See the report by Miller (1985).

32. Helleiner (1977) and most recently Lavergne and Helleiner (1985) have argued

that multinationals have become active agents exercising political pressure in favor of free trade. The structure of trade barriers has been related to patterns of DFI by Helleiner but the later work by Lavergne finds this relationship to be fairly weak. This hypothesis and research do not extend to the *potential* DFI effects in favor of freer trade (which would occur if DFI becomes an alternative response to import competition), which is discussed in Bhagwati (1982b and 1986a) and in the text.

33. In fact, the Ministry of International Trade and Industry of Japan has recently completed a survey of Japanese DFI abroad and found that a large fraction of the respondents cited reasons of the quid pro quo variety to explain their investment decisions. I am indebted to Professor Shishido of the International University of Japan for this reference. See also the theoretical modeling of such quid pro quo DFI in Bhagwati, Brecher, Dinopoulos, and Srinivasan (1987) and in Bhagwati and Dinopoulos (1986), the former using perfectly competitive structure and the latter using monopoly and duopoly structures instead.

34. See also the critique offered by Ranis (1985). Cline (1985) basically defends his position by arguing that the high ratios of trade to GNP typical of Far Eastern economies are likely to trigger difficulties and that he should not have been read to mean that the EP strategy would necessarily lead to such phenomenally high trade growth rates and trade ratios.

35. In the following, I select for treatment only the most important such arguments, given the central theme of this paper. For a more comprehensive review of recent arguments for protection, including those applying to industrial countries—as in Kaldor's (1966) argument for protection to prevent British deindustrialization or Seabury's (1983) advocacy of protection to prevent American deindustrialization for defense reasons—see my analyses in Bhagwati (1985c, 1985e, and 1986c). For a different emphasis, more skeptical of antiprotectist arguments and EP strategy, see Streeten (1982).

36. The theory has been synthesized in Bhagwati (1971), and there is also a splendid short treatment by Srinivasan (1987) in his entry on distortions for *The New Palgrave*.

37. For the original analysis of this problem, see Bhagwati (1980). Further discussion of the question can be found in Bhagwati, Brecher, and Srinivasan (1984).

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THE STATE AND THE INVISIBLE HAND

Stanislaw Wellisz
Ronald Findlay

Economic analysis has always been based on the postulate that people act in their own self interest. Yet, as economists proudly demonstrate, the interaction of selfish individuals in perfectly competitive markets leads, "as if guided by an invisible hand," to socially beneficial outcomes. Of course, economists recognize that competitive markets cannot solve the problems associated with externalities in production and consumption and with the provision of public goods. This creates a role for the state, which appears as a deus ex machina to eliminate whatever deviations from Pareto optimality result from failures of competitive markets. In addition the state may be regarded as also having the duty of redistributing incomes to achieve the targets specified by some social welfare function. In all cases, however, the state is portrayed simply as an instrument to achieve abstract objectives of national welfare.

This standard approach to economic behavior in both its private and public aspects makes two crucial assumptions that have only recently begun to be questioned. First, even though the behavior of private agents is assumed to be selfish, it is taken for granted that the only way they can achieve their aims is to satisfy directly their own wants for goods and services or to satisfy those of others through voluntary exchange. Thus all economic behavior is "useful" or "productive," in the sense of providing goods and services that enter the utility function of someone in society.

Much economic behavior, however, does not fit into this conventional framework. In the case of theft or robbery, the criminals devote their time and energy, as well as material inputs, to depriving other members of society of their incomes by means of coercion or fraud.

Not all illegal behavior is of this type, of course. Smuggling or black marketeering are examples of illegal behavior that provides goods and services to other members of society. Of course, many perfectly legal economic activities are not directed at producing goods and services. The example we shall explore extensively in this article is lobbying—the use of resources to obtain government regulations that boost the incomes of a particular group by raising the prices of what its members sell or by lowering the prices of what they buy.

Second, it is usually assumed that the state seeks to maximize an objective function of social welfare. This assumption is appropriate for normative analysis, but it either leaves open the question of a positive theory of government behavior or makes the fatal mistake of supposing that governments always do only what they should do.

An alternative approach, which we shall adopt here, is to assume that the government maximizes some objective function of its own interest. But what should that function be? Is it rational for the government to maximize public revenue, or public expenditure, or the difference between the two? By analogy with the theory of the firm it is appealing to begin by thinking of the state as a natural monopoly, the "monopoly of the legal use of force," in Max Weber's famous definition, and to conceive of the state as maximizing monopoly profit or "surplus." Such an objective function seems appropriate for an absolute monarch in early modern Europe or for some of today's Third World dictators. But in a modern state the power of the ruler (president, prime minister, or junta) is greatly circumscribed and is usually filtered through a bureaucracy that pursues goals of its own. The monopoly model, with its simple beauty, no longer applies directly.

In the case of modern "democratic pluralist" societies the state is better portrayed not as an autonomous decisionmaker, but as a broker or mediator between interest groups, with economic policy resulting from the pushes and pulls of these factions. People with similar interests lobby to obtain favorable legislation, while the government responds by working out compromises acceptable to the various power groups.

This article is concerned with "income appropriation," that is, with the use of private or state resources to acquire, rather than to generate, income. The traditional term "production" is reserved for activities that generate income. Both appropriation and production can be either legal or illegal, though the bulk of economic literature is concerned only with legal production. Examples of the treatment of illegal production would be the analysis of smuggling by Bhagwati and Hansen (1973) and of the "second economy" in Soviet-type systems by Wellisz and Findlay (1986). The case of legal appropriation is considered in Krueger (1974), where individuals use resources to ac-

quire licenses for quota-restricted imports, and in Bhagwati and Srinivasan (1980), where people strive to divert revenue from the public purse to themselves. Illegal production has been studied by Becker (1968), in his well-known analysis of crime and punishment, and by Tullock (1967) who considers theft as an analogy to lobbying.

Of all the aspects of legal appropriation, rent-seeking has recently attracted the most attention. The term was coined by Krueger to refer to the behavior of people or companies who expend resources to acquire import licenses that command a scarcity premium or "rent" in the form of the excess of domestic over world (tariff-inclusive) prices. The term has subsequently been applied to all types of behavior that we have classified as "appropriation." Bhagwati (1982) proposed the phrase "directly unproductive profit-seeking" activities for the general category, while restricting rent seeking (as we do in this article) to Krueger's original usage.

The Economy and the State

The economic role of the state can be described in different ways, depending on one's view of the state itself and the motives of the people who exercise sovereign power. Certain extreme cases illustrate the nature of the issues involved. At one extreme there could be a government of Platonic Guardians, who selflessly bring about whatever levels of public expenditure and taxation best serve the collective interests of the citizens. At the other, there is the Hobbesian Leviathan, in which case the government serves the absolute ruler's own ends, subject only to his providing the citizens with the minimal framework of law and order that makes his rule preferable to the state of nature. To isolate the role of the different objectives of the two types of government, we assume the same underlying factor endowments and technology for the public and private sectors of the economy in both cases.[1]

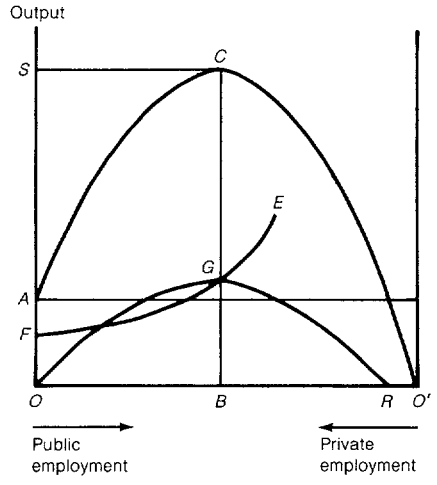
In the private sector of the economy final goods and services are produced under competitive conditions by applying labor to capital available in fixed supply. We shall make the usual neoclassical assumptions concerning the production function, that marginal products of both factors are positive and diminishing. For the time being, we shall treat the final output as a single composite commodity.

The government sector provides an intermediate, collective good, "law and order," which is factor-augmenting in the private sector or "Hicks neutral" in the sense that it augments the productivity of both factors in the private sector equally. To simplify the analytics we assume that the public good is made by labor alone, though all the qualitative conclusions hold if we make the reasonable assumption that the government sector is less capital-intensive than the private sector. There are diminishing returns at the margin to increased gov-

ernment expenditure. The total supply of labor in the economy is fixed, and workers are free to choose employment in either sector, which means that the government must pay a wage equal to the net private sector wage.

The government has the power to tax. We shall assume for now that a tax t is proportional to the excess of income of each factor in the private sector above a basic level. In the absence of the public good (in the Hobbesian "state of nature") each factor earns its basic income, and, of course, pays no tax. Given the fixity of factor supply the tax is nondistortionary. We thus leave aside the familiar problems of the "incentive" and "efficiency" aspects of the tax structure to concentrate exclusively on the "political economy" features of the problem.

Figure 1



The economy described above is represented in figure 1. The total labor supply is shown by OO', with public sector employment measured to the right from O and private sector employment to the left from O'. If all labor is employed in the private sector, no public good is supplied and private output is OA. As labor is transferred to public employment, total output of the final good increases as shown by the rising portion of the ACO' curve. With successive labor transfers fewer workers are left in production. Furthermore, successive additions to public employment have a diminishing effect on private sector productivity.

Output reaches a maximum at BC (equal to OS) when OB workers are in the public, and $O'B$ in the private sector. If public employment increases beyond this point, output declines; output is zero if there are no workers in the private sector.

Government by Platonic Guardians

If the country were guided by selfless Platonic Guardians whose sole aim is to maximize output, the government would impose a tax t^*, yielding just enough revenue to pay the optimal number of public sector workers at the prevailing net-of-tax competitive wage. In figure 1 the curve OGR shows government revenues as a function of employment in the public sector. Since the tax rate is fixed, the tax revenue is directly related to private sector production, upon which the tax is levied. As public employment rises from zero to OB, private income increases, and so does tax revenue. With further increases in government employment, however, income and the tax revenue both decline. The curve FE represents the cost of providing the public good as a function of public employment. When there are no public em-

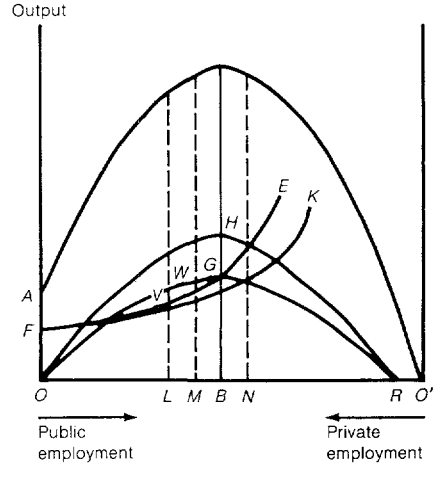
ployees—and hence no public good—the private sector wage is *OF*. As the number of public employees rises, so does the wage. This is because of (a) the increasing private sector capital-labor ratio, and (b) the productivity-augmenting effect of public sector employment. Thus the *FE* curve rises throughout its range. The two curves intersect at *G*. At this point the budget is balanced, and the public good is provided at the socially optimal level.

The Leviathan

The Guardians' polar opposite is Hobbes's Leviathan, which is entirely selfish but a necessary evil. It alone can provide law and order, without which life is "solitary, poor, nasty, brutish, and short." As payment for this essential public good, the Leviathan extracts income from its subjects, which it puts to its own uses. But the Leviathan, no matter how selfish, does not make its subjects worse off than they would be in the state of nature (hence our assumption that basic income is free of tax).

Unlike the Guardians, whose aim is to maximize income accruing to society, the Leviathan's goal is to maximize the difference between the tax take and the public sector wage bill. A Leviathan with unconstrained ability to tax will, however, provide the same volume of the public good as the Guardians—because the higher the final production, the greater the surplus it can extract.

Figure 2



In figure 1, the Leviathan would tax the private sector to keep wages and capital rental down to the level of the state of nature. The wage would remain at *OF* and capital rental at *FA*. Income accruing to both factors would remain at *OA*, as shown by the horizontal line through point *A*, while all the benefits of increased production would accrue to the Leviathan. The surplus reaches a maximum *AS* when *OB* workers are in the public sector. Thus the structure of employment and the volume of production would be the same under the rule of a perfectly benevolent dictator as under that of an utterly ruthless satrap, though of course income distribution is very different in the two cases.

Historically, the taxing power of the executive branch of the government (monarch, president, or dictator) has been circumscribed by figure 2 tradition or by parliamentary rule. This produces a paradox: if the taxes that the Leviathan is permitted to levy are subject to a limit, the structure of production is less efficient, though the public is better off. To demonstrate this proposition, let us assume that the sovereign is not allowed to tax at more than t^*, the rate just sufficient

to pay for the optimal level of public employment, *OB* (figure 2). Clearly, a constrained Leviathan would have no interest employing *OB* people, for it can generate a surplus only if public employment is lower. The surplus is shown as the vertical distance between the tax revenue curve, *OGR*, and the cost-of-public-employment curve, *FE*. From the Leviathan's point of view *OL* represents the best level of public employment. At this point the slopes of the *FE* and *OGR* curves are equal, which means that the marginal cost of public employment equals the marginal tax yield from public employment, so the surplus is maximized.

No matter how high the tax rate, the Leviathan will supply a suboptimal amount of the public good as long as the tax limit is binding. Suppose that the tax limit is raised from t^* to t^+. Since t^+ is higher than t^*, the new tax revenue curve, *OHR*, lies above the *OGR* curve, but both curves reach a maximum at *B*, at which point the marginal tax revenue is zero for any tax rate (figure 2). By the same token, net-of-tax private sector wages are lower under the t^+ than under the t^* regime. The curve representing public expenditure on wages, *FK*, lies below, and is flatter than, *FE*, but both curves have a positive slope throughout the range. The level of public employment that maximizes the surplus, *OM*, will therefore be higher than *OL*, but since the slope of *FK* is positive, point *M* will lie to the left of *B*. Points *M* and *B* would coincide only if the tax rate is high enough to make the *FK* curve horizontal, that is, high enough to keep the population at the state-of-nature income level after tax.

It is easy to find cases in which the tax-constrained Leviathan supplies too little of the public good and extracts a surplus for its own purposes. Well into the eighteenth century European kings maintained great palaces, but did not adequately provide for the safety of the highways. Recent events in the Philippines and elsewhere provide contemporary examples. The prevalent complaint, however, is not that governments are venal, but that they are too big and thus threaten to cramp, rather than assist, private production. How can the excessive size of government be accounted for in our model?

The answer is that the assumption of "one man government" is inapplicable to the modern world. Alfred Jarry's *Ubu Roi* personally extracted taxes from his subjects by beating them with his finance stick. A real life sovereign, whatever his title and whatever his power, has a vast hierarchy of tax collectors and other bureaucrats.

One of the few legitimate ways in which a bureaucrat can enrich himself is by expanding his bureau. To organize large teams efficiently, supervisory hierarchies are needed. For them to be efficient, supervisors must be paid more than those supervised (see, for instance, Calvo and Wellisz 1979). A larger bureau therefore means higher pay.

It also brings more power and prestige, an important consideration to many people, as emphasized by Niskanen (1971) and before him, of course, Parkinson. But the need for staff can be justified only in terms of the bureau's service to the community, as measured by the output of the public good. So bureau heads have an incentive to maximize output subject to the budgetary constraint.

Let us assume again that t^{-} is the historically given tax. If the Guardians were running the government, they would employ *OB* workers at the competitive wage and return to the public the excess of tax revenue over expenditure. The Leviathan would collect the tax and spend a suboptimal fraction of it on the public good. The bureaucracy would spend the full amount to employ *ON* workers.

The bureaucratic monster, unlike the Leviathan, can be made to serve the public interest if an appropriate limit is put on the government's power to tax. If the tax rate were t^{*} and the government were required to balance its budget, it would hire exactly the same number of public sector employees and provide the same volume of public goods as one directed by the Guardians.

We have been using the term "social optimum" to refer to the maximum output of the final, private good. Labor, however, would wish to maximize wages, and capital to maximize profits. Under our assumption that the intermediate public good is relatively labor-intensive, labor would favor an extension of the public sector and capital a contraction, relative to the social optimum.

The production of public goods benefits society by raising private sector productivity. At the social optimum the marginal gain in productivity just equals the marginal product of a private sector worker. If the public sector expands any more, the production loss caused by withdrawing workers from the private sector would outweigh the productivity gain from the corresponding increase in public employment, so that final output would decline. However, the withdrawal of labor from private production increases the capital-labor ratio and raises wages independently of the productivity effect. It follows that labor benefits if private sector employment is reduced by raising public employment above the socially optimal level. By the same token, capitalists would favor a socially suboptimal level of public goods. These results are in line with the tendency of labor-oriented political parties to favor extensions of government activity and for capitalistically oriented ones to resist them.

Revenue and Protection: A Government-Capitalist Alliance

In many developing countries governments rely heavily on import duties as a source of finance. These duties favor import-substituting industries. The state's desire for revenue, and local industry's desire

for protection, can result in a mutually beneficial regime of high tariffs, even though it is obviously inimical to economic efficiency. We demonstrate the possibility of this outcome, under plausible conditions, in the context of a simple model.[2]

Since we are considering international trade, it will be convenient to assume that the private sector produces two goods, the relative prices of which are fixed on the world market, a labor-intensive export and a capital-intensive import substitute, as in the familiar Heckscher-Ohlin model.[3] Both sectors of private industry draw on the same pool of capital, in fixed supply, which is freely transferable and malleable, so that all capitalists form a single interest group. There is also a fixed labor pool, which can be competitively hired by private employers or by the government. For the sake of simplicity, we shall ignore, in this section, the effect of government output in enhancing the productivity of factors hired by the private sector.

We assume that the objective of the government is the "bureaucratic" one of maximizing public employment, according to the Parkinson-Niskanen "law" of the previous section, subject to the requirement that the budget be balanced, with tariff proceeds being the sole source of revenue. A tariff, in conjunction with the given relative price of the two goods on the world market, would determine the real wage by the familiar Stolper-Samuelson theorem, as well as the level of imports and government revenue, assuming initially that the entire labor force is employed in the private sector. The government now uses the revenue to hire workers at the tariff-determined wage until expenditure is equal to revenue. Note that as labor is withdrawn from the private sector total revenue will fall, since production of the capital-intensive import substitute will rise according to the Rybczynski theorem, which thus implies a reduction in the volume of imports and hence in the tariff proceeds.

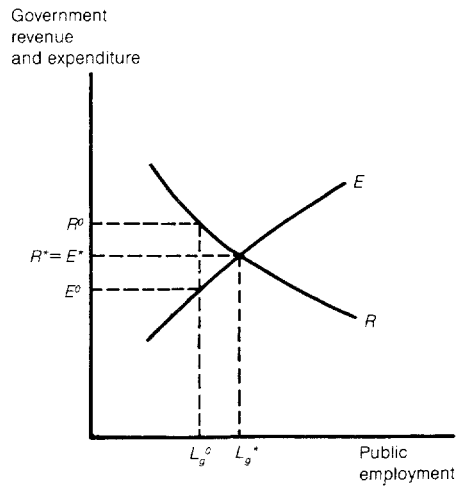
If the initial tariff is sufficiently small, an increase in the tariff level, at constant public employment, would raise total revenue and also reduce total expenditure, since the higher tariff would lower the real wage, by the Stolper-Samuelson theorem. Thus if the tariff rate is below the maximum revenue level, it would be to the government's advantage to raise the tariff still further since doing so would both increase revenue and reduce the cost of public employment. At the maximum revenue point itself a further small increase in the tariff would leave revenue unchanged, by the definition of a maximum, while it would still lower the real wage so that public employment could be increased further. Thus the optimum for the bureaucratic government must be at a tariff level that is *beyond* the maximum revenue point or to the right of the peak of the Laffer curve.

In order to determine the tariff that maximizes public employment subject to a balanced budget, we first observe that maximizing public

employment subject to a balanced budget is logically equivalent to maximizing the budget surplus (or minimizing the budget deficit) for a given level of public employment. The premise is that maximizing the surplus for given public employment makes possible the biggest increment in public employment and so best contributes to the sole objective of government policy in the model. At the optimum any change in the tariff level will result in a deficit, while any higher level of public employment must result in a deficit even if the tariff rate is adjusted in such a way as to minimize it.

In figure 3 we depict government revenue R and expenditure E as functions of the level of public employment L_g. For each value of L_g, such as L_g^o, the tariff t^o is chosen in such a way as to maximize the surplus S^o, equal to the difference between revenue R^o and expenditure E^o. Revenue and expenditure each depend on the tariff rate and level of public employment since these variables determine the wage rate and the level of imports. As L_g is increased the tariff is altered appropriately at each value of L_g to maximize the vertical distance between the R and E curves, thus maximizing the budget surplus. At the intersection point corresponding to the optimal level L_g^* of public employment the budget is exactly balanced and so the corresponding tariff rate t^* is the optimal one for the government's objective. Employment levels to the right of L_g^* correspond to deficits and hence are not feasible. The R function slopes downward since higher public employment reduces the volume of imports, as explained earlier, and hence of tariff proceeds. The E function slopes upward since the greater volume of public employment results in a higher level of government expenditure.

Figure 3



Since the return on capital is an increasing function of the tariff, capitalists would ideally desire the tariff to be prohibitive. Thus capitalists, who would already be benefiting from the tariff set above the maximum revenue level, might even be able to persuade the government to raise it still higher than t^*. Labor would, of course, exert pressure in the opposite direction and attempt to move the economy toward free trade. If labor and other interests are weak, the result will be a high protective wall for import substitution in industry, sustained by the implicit alliance of private capitalists and the bureaucratic state. Thus what appears to be irrational from the politically naive perspective of neoclassical trade theory is perfectly explicable from the perspective of "political economy." It should be said, however, that in this case to understand is not necessarily to forgive.

Pressure Group Policymaking and Trade Barriers

Thus far the analysis has paid little attention to the influence of conflicting pressure groups on policy formulation. This section concentrates on this issue, without forgetting that, powerful as such groups may be, the will of the government also matters. The state may be regarded as an autonomous decisionmaker, or as an arbitrator among opposing interest groups. The latter role is especially important in modern democracies, where, typically, economic groups and factions strive to obtain legislation favoring their particular interests.

James Madison held economic factionalism to be inherent in pluralistic, democratic societies; thus the role of the government is to find compromises acceptable to the divergent economic interests. This view has found wide acceptance among political scientists, such as Bentley (1908) and Truman (1951). In their studies of the determinants of political action, economists initially did not consider the role of pressure groups. Instead, they concentrated on the analysis of elections and on the role of politicians and parties (see Schumpeter 1947, Downs 1956, Buchanan and Tullock 1962, and Riker 1962). By the 1970s, however, the pressure group approach to policymaking, stimulated by Olson's *Logic of Collective Action* (1965), gained wide currency (see also Posner 1974, Stigler 1975, and Brock and Magee 1978). Other analyses taking this approach included Becker's formalization of pressure group theory (1983), Brock and Magee (1978) and Findlay and Wellisz's (1982) general equilibrium politicoeconomic models with endogenous trade barriers, and Bhagwati's (1980) and Bhagwati and Srinivasan's (1980 and 1982) analyses of lobbying costs.

The idea behind the pressure group approach to policymaking is simple. People or enterprises with similar economic interests realize that, by organizing, they can exert greater pressure on the government than they can individually. These organizations must persuade the potential beneficiaries to share in the cost of lobbying: the political effectiveness of interest groups depends, in part, on how effectively the "free rider" problem is solved. The lobbies incur expenditures to further their cause; the government responds to pressures and counterpressures and designs compromise policies. Such policies may not be to the advantage of the nation as a whole, so neoclassical analysis would term them irrational from a social point of view. Yet the policies are rational in the sense that they serve the interests of the relevant groups that lobby for them.

The pressure group approach is consistent with, but broader than, the analysis of preferences expressed through votes. The latter cannot be used to analyze policymaking in pluralistic societies that lack effective formal mechanisms for the expression of public opinion. And even where voting is the decisive factor, organized lobbies make their influence felt through propaganda, campaign contributions, and other

means. Many election results are incomprehensible unless one is aware of the influence of groups.[4] Thus, if policies reflected only the self-interest of the majority of voters or their view of the good society, special interest legislation would not exist. It does exist, for example, when a few producers are protected at the expense of many consumers. The phenomenon can readily be explained in terms of the disproportionately large influence exerted on policymakers by small, concentrated interest groups (for a proof of this proposition, see Wellisz and Wilson 1986).

Factions and Tariff Policy

The essential features of the endogenous determination of tariffs may be seen in a simple Madisonian model with two politically active factions: landowners and capitalists. Farm goods are produced by applying labor to land, and manufactures by applying labor to capital.[5] Capitalists and landlords hire workers from a common pool. Part of the farm production is consumed domestically, and the rest is exported at fixed terms of trade in exchange for manufactured goods that compete with those produced domestically.

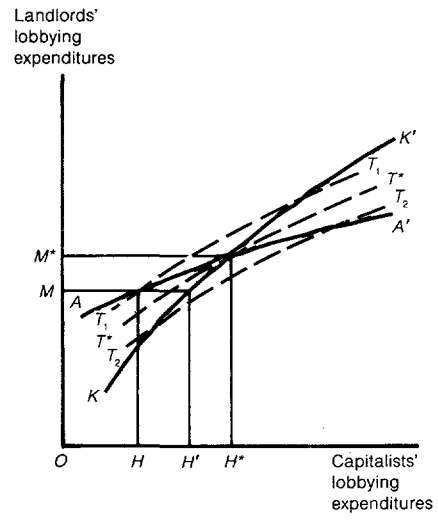
We assume that production is carried on under competitive conditions, but that, for political purposes, individuals organize lobbies to foster their common interests. The capitalists, whose manufactured goods compete with imports, form a protectionist faction. Since landlords would be hurt by a tariff on manufactures, their faction favors free trade. Where the interests of labor lie is less clear. A tariff on manufactured goods lowers the wage in terms of such goods, but raises the wage in terms of the exportable farm product. Depending on the proportion in which workers consume agricultural and industrial goods, a tariff may therefore raise or lower real wages. We shall assume for now that workers remain politically neutral.

In choosing its policy the government takes into account the pressure exerted by the opposing lobbies. How much weight is attached to each depends, of course, on the government's ideology, as well as internal and international obligations. The government's preferences and constraints determine the "tariff formation function," which has, as its arguments, the pressures exercised by the opposing lobbies. The strength of a lobby's pressures may be measured by how much it spends. The tariff rate is thus an increasing function of the political expenditure of the manufacturers and a decreasing function of that of the landlords.

To promote rationally the aims of its faction, each lobby spends resources on the basis of its perception of the actions of its opponent. The political struggle to determine the tariff level can be thought of as a Cournot-Nash process in which each faction, taking the actions of

the other side as given, calculates the optimal level of its own spending in the light of the tariff formation function and of the structure of the economy. In figure 4, the capitalists' and landlords' lobbying expenditures are indicated, respectively, along the horizontal and the vertical axes. The reaction functions KK' and AA' represent the optimal behavior of each of the two lobbies, given the other one's expenditure. For instance, if the capitalists' lobby spends OH to promote tariffs, the landlords' lobby will react by spending OM to fight them. The capitalists will then react by raising their spending to OH', and so on. The dotted lines show equal tariff contours, with T_1T_1 indicating a lower tariff level than T^*T^*, which, in turn, is lower than T_2T_2.

Figure 4



When capitalists increase their spending on tariff promotion, it is likely that landlords will respond by spending enough to lower the tariff from the level that would obtain if they had done nothing, but not enough to return it to its initial level. For the capitalists, symmetric behavior is assumed. It follows that the tariff rises as one moves from left to right along AA', the landlords' reaction function, and falls as one moves from left to right along KK', the manufacturers' reaction function. It also follows that KK' is steeper than AA', which is a sufficient condition for the stability of the equilibrium tariff t^* (corresponding to the line T^*T^* in figure 4) endogenously determined by the intersection of KK' and AA', yielding OH^* and OM^* as the optimal levels of political expenditure by capitalists and landlords, respectively.[6] At the equilibrium point for each faction, the marginal cost of political expenditure equals marginal revenue, which is the benefit that would be derived from the change in the tariff resulting from the marginal increase in political spending.

In real life, of course, political behavior is more complicated. But the simple model brings out the essential features of policymaking. Lobbying determines the tariff rate. The tariff influences the returns to the productive factors, hence income distribution.

If lobbies simply bribe decisionmakers, then from a social point of view lobbying constitutes an income transfer. Government officials get richer at the expense of the lobbying interests, but except for transaction costs no real resources are used up in the process. In the past, societies took a permissive attitude toward influence-buying. Many government posts could be bought (in Europe the practice of buying military commissions persisted until well into the nineteenth century), and their occupants were expected to further their own interests or those of their backers. Today, it is more expensive for interest groups

to influence policymakers. As a result, total spending on lobbying is reduced (see Becker 1983). Paradoxically, however, rules limiting influence-buying raise the resource cost of lobbying, though only up to a point.[7] Legitimate lobbying activities, such as publicity campaigns and election contributions, do use economic resources. In the limiting case there is no transfer element, so the social and private costs of lobbying are equal.[8]

Insofar as lobbying uses real resources, these are withdrawn from production. Conventional economic analysis does not consider the policy formation process, hence it fails to take into account that over and above the costs of tariff distortions, there are the real resource costs of lobbying for and against tariffs. Conventional analysis also holds that a lowering of trade barriers always increases welfare. There is the possibility, however, that the costs of a struggle for trade liberalization might outweigh the benefits of the more liberal policies.[9] As in war some victories might be Pyrrhic ones.

Quotas, Domestic Content Rules, and Voluntary Restraints

National interest arguments can be made for the imposition of moderate tariffs to protect infant industries, to exploit a country's monopoly power, and (especially in the case of developing countries) to raise fiscal revenue. Standard economic analysis fails, however, to explain the proliferation of quantitative trade restrictions that create more distortion (or bring in less fiscal revenue) than do equivalent tariffs that give the same degree of protection.

To be sure, there are pragmatic reasons why governments may resort to quantitative restrictions. The freedom to manipulate tariffs is limited by international treaties; these typically permit quotas for specific purposes—for example, to correct a temporary trade imbalance. The use of quotas also gives power to government officials by enabling them to reward friends through generous allocations and to punish enemies. But to reach a fuller understanding of the selection and use of quantitative restrictions one must turn, once again, to interest group considerations.[10]

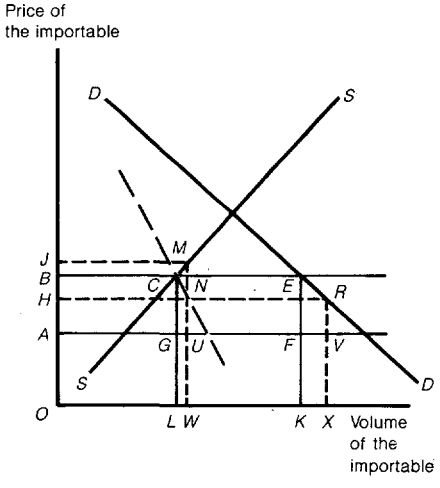
The introduction of import quotas, as compared with a regime of pure tariffs, strengthens protectionist forces. To understand this tendency, let us begin from the tariff equilibrium of the previous section. Consider the introduction of an import quota that would further reduce the import volume. This quota would raise the domestic price of the imported commodity and would provide further protection for domestic manufactures. If the tariff rate were held constant a rent would emerge to the holders of the import licenses equal to the difference between the domestic price and the world price plus tariff. The potential holders of these licenses, let us call them "traders,"

would therefore be willing to join the protectionist group. Government revenue would fall if tariff rates remained unchanged. If, however, the initial tariff were set at less than the maximum revenue level, the tariff rate could be raised to restore the initial revenue while still leaving a margin for rent.

In figure 4 the protectionist reaction function *KK'* would shift to the right, since the traders would be willing to contribute to the war chest of the lobby in the expectation of obtaining rents. The antiprotectionist landlord faction would have the same reaction function as before. The new equilibrium would therefore be to the right along *AA'*, implying a higher degree of trade restriction *and* greater expenditure of resources on lobbying by both factions. We have therefore shown that the possibility of using import quotas in addition to tariffs makes for an unambiguously more restrictive and wasteful trade regime than one limited purely to tariffs.

Domestic content rules lay down a specified proportion of a product (by quantity or value) that must be produced with domestic inputs in order to be sold on the domestic market. They are a way of shielding domestic producers from foreign competition without arousing the wrath of powerful antiprotectionist groups.[11] A domestic firm that does not meet the rules has to pay a higher duty on the imported content or obtains lower protection on the final product or both.[12]

Figure 5



This type of protection is popular in industries where the final product is assembled from different parts, which may be imported or manufactured domestically. It has been used in Australia for automobiles, tractors, industrial machinery, petrochemicals, and various consumer nondurables (see Lloyd 1973). In many developing countries domestic content rules are weak for newly established industries, then gradually tightened so as to promote local production of parts and components.

The essential aspects of domestic content rules can be seen in the following example. Consider a commodity such as milk, which can be produced by domestic dairy farmers or imported at a fixed world price. In figure 5 demand and supply curves *DD* and *SS* are depicted, with *OA* indicating the world price. If a tariff of *AB* is imposed, the domestic price will be *OB*, the quantity demanded will be *OK*, domestic production will be *OL*, and imports will be *LK*. Tariff revenue of *GCEF* accrues to the government.

If the regime is changed to a domestic content rule in place of the tariff, how can the same import-production ratio be preserved? The solution is indicated in figure 5 by the dotted line through point *C*.

We shall now assess the repercussions of this change on domestic prices, output, and imports.

If the domestic price remained unchanged at *OB*, importers, whose cost under the new regime would be only *OA*, would receive rents equal to *GCEF*, the tariff revenue previously accruing to the government. As a result, importers would try to increase the supply of milk to domestic consumers. The imported component is available freely at the world price, but importers must increase their purchases from domestic producers in the same proportion. This process will lower the price paid by domestic consumers below *OB* but raise the price received by domestic producers above *OB*. Equilibrium will be achieved when all the rents have been competed away.

At equilibrium the price paid by domestic consumers is *OH*. The total quantity demanded is *OX*, with *OW* supplied domestically and *WX* imported. The price received by domestic producers is *OJ*, the level necessary to induce them to supply *OW*. The area *HJMN*, the premium to domestic producers, is equal to *UNRV*, the rents on the imported component, so that sales to domestic consumers break even.

Compared with the tariff regime both consumers and producers appear to be better off. Consumers pay a lower price and consume a greater quantity. Producers benefit from the rise in domestic supply price. However, the additional production of *LW* increases the domestic resource cost to society by *GCMV*, the excess of domestic opportunity cost of the resources involved over the cost *LW* at the world price. The government, of course, loses the entire tariff revenue.

As can be seen from figure 5, the more inelastic is the supply, the greater is the gain to domestic producers. In the limiting case of zero elasticity the replacement of a tariff by an equivalent domestic content scheme would transfer the entire tariff revenue to the domestic producers, while consumers would suffer equally in either situation.

It is therefore not surprising that pressure for domestic content protection frequently arises in industries where there are either natural or artificially created barriers to the expansion of output. Examples would be industries where there are extensive economies of scale, government licensing of entry, or "closed shop" labor unions.

Analytically identical to domestic content rules for commodity imports are schemes that specify numerical ratios between domestic and foreign workers in employment, either explicitly or implicitly through manipulation of job specifications, seniority rules, and so forth. Findlay and Lundahl (1987) develop a model along these lines to apply to racial discrimination between white and black labor in contexts such as South Africa.

Of all the trade restrictions, voluntary export restraints (VERs) appear to be the most irrational. The imposition of VERs raises prices to the consumers, without yielding any revenue either to the government

or to the importers. Yet in advanced industrial countries VERs are rapidly becoming the favorite form of trade restraint. They are sometimes imposed in circumstances where international treaties, such as the General Agreement on Tariffs and Trade, prohibit the tightening of mandatory import restrictions. VERs may also be represented as a mild measure, to be followed by compulsory import barriers in case of noncompliance (see Jones 1984).

To understand VERs we must take into account the interaction between domestic and foreign interest groups. Consider the relations between two countries, which we shall call "United States" and "Japan," with goods manufactured in the latter being exported to the former, while agricultural products move in the opposite direction. The U.S. manufacturers would want to erect trade barriers to protect their interests, while Japanese manufacturers would favor free trade. So would U.S. farmers, but, for the sake of simplicity we shall assume that they remain politically passive.

In this model, the terms of trade are determined by the general equilibrium of the world economy. The tariff level that emerges from international negotiations reflects the relative amount of resources committed by both sides to further their respective causes, as in the Madisonian model presented earlier.

Suppose that, under the resulting tariff treaty, total imports are greater than the level that would prevail under an optimum tariff regime. A further restriction of U.S. imports would give increased protection to the import-competing industry and would also increase government revenues. An equivalent reduction of Japanese exports would have the same protective effect on U.S. industry. In this case, however, the revenue would accrue to the Japanese exporters, who would sell less, but who could, therefore, charge a higher price. Thus VERs work in favor of both parties: U.S. manufacturers receive more protection, while Japanese exporters are able to charge higher prices. Domestic consumers lose; so do the specific factors in the domestic export sector; but they are also passive actors in the game.[13]

Lobbying and Democracy

In a struggle among interest groups, who is likely to win, and who to lose? Concentrated interest groups seem to carry more weight than diffuse ones. The latter do not have much incentive to form a lobby. Collectively, the millions of shirt-wearers in the United States lose more through restraints on shirt imports than is gained by U.S. shirtmakers. Individually, however, each of the consumers has little at stake, but for each of the producers the matter is of crucial importance. It is therefore easier to organize the few makers into a lobby than the many wearers. There is also a question of group discipline.

Small groups are virtually self-policing; the larger the group, the more severe the problem of free riders.

As a second generalization, reallocative rules usually favor small groups over large ones (size being measured by income rather than membership). Distortions that reallocate income impose a deadweight loss on society—that is, they reduce the total availability of goods and services. A large group carries a larger part of the burden than a small group does.

The advantages of smallness and of concentration are reflected in the prevailing pattern of distortion. Industrial countries subsidize and protect agriculture, whereas many developing countries favor their relatively small industrial sectors. Within each group there are small but highly organized special interests receiving privileged treatment.

The results of group action thus run counter to the principles of majority rule and social justice. The minority often wins, and income is not necessarily redistributed from rich to poor. But group action also has positive effects. Like advertising, lobbying spreads misinformation, but it also provides information that would otherwise not be available. Lobbies make people more aware of the issues and presumably increase the rationality of choices made by the voters. Most important of all, group action protects minority interests against the potential dictatorship of the majority. Defeat at the polls does not put minorities completely at the mercy of those who win. The political strength of small groups gives them a countervailing power essential for the existence of a democratic society.

Rent-Seeking

The distortions caused by the lobbying of interest groups may have a potentially valuable by-product that each group does not initially appropriate for itself. For instance, import quotas may be imposed to protect local manufacturers, or to defend the currency, without there being an advance plan on how to allocate the consequent rents. This situation promotes rent-seeking—activities intended to capture the rents (see Krueger 1974). A similar phenomenon, called revenue-seeking by Bhagwati and Srinivasan (1980), may occur if the government fails to allocate in advance the fiscal revenues generated by a tariff.

In contrast to political lobbying, which is inherently a group activity, rent-seeking may take the form of individuals competing against each other. For example, import license petitioners may have to queue up, with rewards going to those who do not get discouraged or who fill out the numerous documents needed to get a license. Individuals engaged in rent-seeking cannot also do productive work at the same time, so rent-seeking, like lobbying, shrinks the production possibility frontier of the economy.

To explain the reasoning underlying the rent-seeking analysis con-

sider a country that completely specialized in the production of a single good, wheat, which can be exported in exchange for cloth at fixed terms of trade of a bushel of wheat for a yard of cloth. There are 12 million workers engaged in wheat production, in which they have a constant average (and marginal) product of one bushel per worker, so that labor is the only scarce factor of production. We assume that under initial free trade conditions the country consumes 6 million bushels of wheat and exports the remaining 6 million in exchange for 6 million yards of cloth.

Suppose now that an import quota of 4 million yards of cloth is imposed. The terms of trade are still one for one, so exports of wheat will decline to 4 million bushels. With all workers continuing to produce wheat the domestic market will now have to absorb 8 million bushels of wheat and 4 million yards of cloth. With more wheat and less cloth available the domestic relative price of cloth in terms of wheat will rise, say, to two bushels per yard. Importers will reap a "scarcity rent" of a bushel of wheat per yard of cloth imported, in total equal to 4 million bushels of wheat. This rent is a pure transfer, the gain to the importers coming directly at the expense of consumers. By forcing consumers to buy less cloth and more wheat than they would like, at world prices, the quota also imposes an additional welfare loss.

All this is standard analysis. Krueger's innovation was to observe that import quotas would be sought after: a production worker could quit his job and spend his time writing petitions to get an import license entitling him to buy the foreign good and sell it at the higher home price. The quota thus imposes an extra cost: the output lost when people devote themselves to rent-seeking rather than production.

Consider an eminently "fair" system of license allocation: the quota will be divided equally among all applicants. How many will apply? Quite obviously, as the number of applications grows, the quantity of cloth for each license decreases. Furthermore, as workers withdraw from production to become rent-seekers, less and less wheat is produced, so the domestic price of cloth falls relative to the price of wheat. At some point rent-seeking and wheat production will be equally profitable, and labor transfers will cease. For example, equilibrium may be reached when the domestic price of cloth is 1.5 bushels of wheat, so that the scarcity rent on cloth imports equals 2 million bushels of wheat. At equilibrium the rent to each rent-seeking individual equals the wage that the same person could earn in production—that is, one bushel of wheat a year. It follows that at equilibrium there must be 2 million rent-seekers, so that the country produces 2 million bushels of wheat less than before the imposition of the quota. The economic cost of rent-seeking, as measured by the loss of production, is equal to the value of the rent created by the quota.

How important are such rents in a developing country? Krueger (1974) estimated that they amounted to 7 percent of India's income in 1964 and to 15 percent of Turkey's in 1968. By including financial market distortions (which were ignored by Krueger), Mohammad and Whalley (1984) raised the estimate of rents in India to between 30 percent and 45 percent of the gross national product.

These figures suggest that the social cost of rent seeking is staggering. But is it conceivable that a third (or more) of a country's population is engaged in rent-seeking? True, in India and other developing countries there are endless lines of petitioners at every office, but virtually all villagers, who make up 80 percent of the population, and most urban dwellers perform their usual productive tasks.

A closer look at the analysis reveals that the cost of rent-seeking cannot be higher than the value of the rents, but it can be lower. In Krueger's words, the estimates of rents "may be interpreted as the deadweight costs from quantitative restrictions in addition to the welfare costs of their associated tariff equivalents if one believes that there is competition on rents" (1974, p. 301).

The qualifying clause is extremely important: rent-seeking is eliminated, or at least greatly reduced, if the division of the spoils is decided upon in advance. For instance, it is common practice to allocate quotas as a function of imports in a base year. Rent-seekers may try to change the allocation, but there is no presumption that the entire rent will be competed away. Barriers to entry are likely to be particularly severe in the market for influence.

Even if competitive rent-seeking does occur, the cost to society is likely to be much smaller than the size of the rents. The Krueger hypothesis is that competition means standing in line or filling in forms. But competition can also mean bribing officials, a socially reprehensible act but one that in economic terms represents a pure transfer. We have here yet another example of the difference between private and public virtues. A fair system of free competition for rents, administered by incorruptible public servants, paradoxically imposes the greatest social cost.

It remains true, nevertheless, that, by ignoring rent-seeking, conventional measures of welfare underestimate the cost of quotas. Moreover, unlike lobbying, which in a pluralistic society may play a positive role, rent-seeking has no redeeming social virtues: it is sheer waste. Thus the rent-seeking analysis carries an important policy message: avoid, if you can, the imposition of quantitative restrictions; if you cannot, make sure that the rents will not be competed away.

Conclusion

This article's objective has been to bring out the implications for economic analysis of two crucial departures from traditional assump-

tions. One is that self-interested individual behavior in the economy is not confined to the provision of directly useful goods and services for oneself or others through exchange. Such behavior can also be intended, through group action, to influence government rules and policy to favor the group at the expense of the rest of society. The other is that the government cannot always be regarded as either a selfless guardian of the public interest or as an impartial mediator between different parts of society.

Once this perspective is adopted, many aspects of economic life that are deemed irrational by traditional neoclassical analysis—such as high tariffs in small open economies or heavy public expenditure—become explicable as expressions of the interests of the relevant groups. In a world of oligopolistic group interests in the private sector and an autonomous state in the public sector, the "invisible hand" is not always benign: self-seeking does not necessarily promote the common good.

Abstract

This article discusses the consequences for resource allocation of the behavior of self-interested groups within and outside the government. The power groups that are considered are the state as a surplus-maximizing monopoly, the self-aggrandizing bureaucracy, and private lobbies with divergent interests. The article uses the analytic tools of neoclassical political economy and discusses recent writings in the field.

Among the problems dealt with are the supply of public goods, the severity of trade barriers, and the choice of tariffs, quotas, domestic content rules, and voluntary export restraints as instruments of commercial policy. The discussion takes into account the cost of lobbying and rent-seeking, the competition for spoils resulting from government-imposed restrictions on the free allocation of resources. The article shows that for society as a whole the outcome of group rivalries is, in general, less favorable than outcomes based on atomistic individual behavior and benign government, which is the framework adopted in most standard economic analysis.

Notes

1. The analysis in this and the next two sections draws on the model developed in Findlay and Wilson (1987).

2. For further details on the material in this section, see Findlay and Wellisz (1983).

3. This case applies to a developing country that both exports and imports manufactured goods. We later discuss a specific factors model, more appropriate for the case where primary commodities are exported and manufactures imported.

4. Mayer (1984) elegantly integrates the pressure group and voting approaches.

5. We assume, for simplicity, that agriculture does not require capital and that manufacturing does not require land. Our results could be generalized by assuming that that ratio of capital to land were lower in agriculture than in industry.

6. Multiple equilibria are, of course, possible, but we shall assume that the equilibrium is unique.

7. It is clear that a Draconian law prohibiting all forms of lobbying would eliminate all lobbying expenditure, so there could be no resource cost.

8. The relation between private and social cost of lobbying is discussed at greater length in Wellisz and Findlay (1984).

9. Bhagwati (1980) and Bhagwati and Srinivasan (1980) point out that an evaluation of the economic costs of lobbying must take into account the distortion of the economy caused by existing trade barriers. The greater the degree of distortion the lower the opportunity cost (at world prices) of the factor favored by the distortion. In an economy so grossly distorted that the accumulation of the protected factor is "immiserizing," lobbying can increase welfare by absorbing enough of the factor that has a negative shadow price as a result of the distortion.

10. This section summarizes Findlay and Wellisz (1986).

11. For a discussion of the effect of domestic content rules on resource allocation, see Corden (1971, pp. 45–50), and Grossman (1981), as well as Findlay and Wellisz (1986).

12. Domestic content requirements may also be imposed by the importing country wishing to limit preferential treatment granted to specific countries, as in the case of the European Community's imports of textiles from developing countries under the Lomé Convention.

13. See Feenstra (1984) for an analysis and measurement of the welfare costs of VERs to the U.S. market for automobiles.

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TECHNOLOGICAL PRIORITIES FOR FARMING IN SUB-SAHARAN AFRICA

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Prabhu Pingali

Advanced agricultural technologies have not achieved much success in Sub-Saharan Africa. Attempts to match Asia's Green Revolution in food grains have often failed. The use of tractors has produced disappointing results and has been abandoned in many areas. Many irrigation projects have yielded low or negative returns.

One reason for this unsatisfactory record is that the wrong technology priorities have been followed in several countries. Other reasons include faulty pricing policies, inadequate infrastructure, and poor institutional development. This article focuses on technology priorities and is intended to provide an analytical framework for making choices about technology.

Sub-Saharan Africa has a wide range of climates, soils, and labor, which leads to a variety of farming systems. Technology strategies have often failed to take proper account of these local differences, so have not been cost-effective.

Farmers change their techniques in two ways: (a) they may decide to increase the use of an input with which they are already familiar (factor substitution), as when they decide to weed more intensively, to apply organic fertilizer, or to make simple improvements to their land, or (b) they may adopt techniques that are new to them, in which case they have to go through a learning process. In either case farmers will make only those changes that they think will reduce unit costs of production (including the implicit cost of family labor and the opportunity cost of land). That a technique is highly advanced does not necessarily mean that it will reduce production costs in African conditions.

Techniques that are new to local farmers may have been used elsewhere and can be applied virtually unchanged: one example is the adoption of machinery. However, the technology often needs to be changed, which requires some research and development to adapt it to local conditions.

It takes a long time for agricultural research to bear fruit in increased production. The research and technology strategies adopted today will have their full impact in the first quarter of the next century, which is the planning horizon we employ in this article. In most cases, the chosen techniques and therefore the technology priorities will have to be tailored to local conditions. In a few cases, however, local conditions can be changed by investing in infrastructure and encouraging migration, making it cost-effective to use more advanced techniques.

The Evolution of Farming Systems

Large parts of Africa are still farmed by traditional methods of shifting cultivation. Farmers slash and burn patches of forest, farming the land for a few years until its fertility diminishes. The farmers then move on to another forest patch, leaving the land for twenty years or so to recover its natural fertility. Little tillage is necessary, and digging sticks are enough for the purpose. Draft animals are not needed (and in any case cannot survive in African forests, because tsetse flies spread trypanosomiasis). This phase of forest fallow farming lies at one end of a spectrum of agricultural techniques, with multiple cropping at the other end (see table 1). The evolution from shifting cultivation to multiple cropping is driven by population growth and by the higher returns to farming which arise when market infrastructure improves and farmgate prices increase (Boserup 1965, Ruthenberg 1980, and Pingali, Bigot, and Binswanger 1987). Farmers first move to a bush fallow system: they cultivate their patches for longer periods (six to eight years) and leave them fallow for a similar period. Because they have to weed and till the land, they start making regular use of hoes.

As population density grows, bush gives way to grass cover. The fallow period is reduced, perhaps to no more than a year. Plowing and intensive weeding are needed, so the use of draft animals becomes economic (and possible, since the disappearance of forests reduces the tsetse fly menace). Animal manure helps to fertilize the soil. Since there is abundant grazing on pastures and grass fallows, the cost of keeping cattle is low.

As population density increases still further, annual cropping and later multiple cropping become the rule. This stage has been reached in much of Asia, but is still uncommon in large parts of Africa. Land is now scarce, and its value rises. Farmers find it cost-effective to shift from manual techniques to labor-saving devices such as milling ma-

Table 1. *Farming Operations in Different Farming Systems*

Operation or situation	*Forest fallow system*	*Bush fallow system*	*Short fallow system*	*Annual cultivation system*	*Multiple cropping system*
Land clearing	Fire	Fire	None	None	None
Land preparation and planting	No land preparation; use of digging stick to plant roots and sow seeds	Use of hoe and digging stick to loosen soil	Plow	Animal-drawn plow and tractor	Animal-drawn plow and tractor
Fertilization	Ash, perhaps household refuse for garden plots	Ash, sometimes chitimene techniques,[a] household refuse for garden plots	Manure, sometimes human waste, sometimes composting	Manure, sometimes human waste, composting, cultivation of green manure crops, chemical fertilizers	Manure, sometimes human waste, composting, cultivation of green manure crops, chemical fertilizers
Weeding	Minimal	Required as the length of fallow decreases	Intensive weeding required	Intensive weeding required	Intensive weeding required
Use of animals	None	Animal-drawn plow begins to appear as length of fallow decreases	Plowing, transport interculture	Plowing, transport interculture, postharvest tasks, and irrigation	Plowing, transport interculture, postharvest tasks, and irrigation
Seasonality of demand for labor	Minimal	Weeding	Land preparation, weeding, and harvesting	Land preparation, weeding, and harvesting	Acute peak in demand around land preparation, harvest, and postharvest tasks
Supply of fodder	None	Emergence of grazing land	Abundant open grazing	Open grazing restricted to marginal lands and stubble grazing	Intensive fodder management and production of fodder crops

a. To augment the ashes from the bush cover, branches are cut from surrounding trees, carried to the plot of land to be cultivated, and burned to provide extra nutrients for the soil.

chines, mechanical pumps, and tractors. They have to use manure or chemical fertilizers to maintain soil fertility. Low-cost irrigation can become economic. The transition to these new technologies depends on many factors—the relative cost of labor, capital, and fertilizers; the cost and availability of credit; the reliability of markets for inputs and output; the access to spare parts and repair facilities; and the adequacy of information and training systems.

Population growth is only one influence on farming systems. Other powerful forces include access to urban or foreign markets, which depends on improvements in transport infrastructure and marketing facilities. When farmers are able to sell a surplus, they want to grow more by using more lands—so farming becomes more intensive as surely as it does when populations grow. However, the pattern is often fairly patchy, because good market access may be confined to small areas, and farmers may migrate to areas with high-quality soils and infrastructure.

Classifying Countries

The conventional way of measuring the abundance of land in a particular country is arable land per capita. This measure is unsatisfactory, since it does not take account of differences in soil quality and climate. The Food and Agriculture Organization (FAO) has come up with a new measure that does so. Its project on Land Resources for Populations of the Future (Higgins and others 1982) estimated, for most developing countries, the physical potential for food production at different levels of technology.

Each country was divided into a number of agroecological cells. For each cell, the FAO estimated the maximum number of calories of food production that could be sustained at three levels of technology—low input, intermediate input, and high input. It then added up these cell figures to give total potential calorie production for each country. Although this physical approach is no guide to future agricultural production, it does provide a standardized measure of a country's land endowments.

For all countries in Sub-Saharan Africa and for selected ones in Asia and Latin America, we look first at the population projections of the World Bank for the years 2000 and 2025. We divide the country populations by the FAO's estimates of potential calorie production—at intermediate input technology, as this is the level most African countries should reach between 2000 and 2025. The result is a standardized population density: the number of people per million kilocalories of production potential. We call this the *agroclimatic population density*. Even given the uncertainties and margins of error inherent in such an exercise, the picture that emerges is striking and useful.

When countries are ranked conventionally by population per square

kilometer of agricultural land, Bangladesh comes first, India comes seventh, Kenya falls somewhere in the middle, and Niger is near the bottom. When ranked by agroclimatic population density, the rankings change dramatically: Niger and Kenya are more densely populated than Bangladesh is today, and India ranks only twenty-ninth on the list. Kenya and Niger have large, semiarid areas of low calorie potential, where extensive livestock production is the only profitable form of farming. Bangladesh and India, in contrast, have invested in irrigation and have considerably increased their scope for multiple cropping. (The FAO's estimates for potential calorie production include the impact of irrigation investments already made or planned up to the year 2000.)

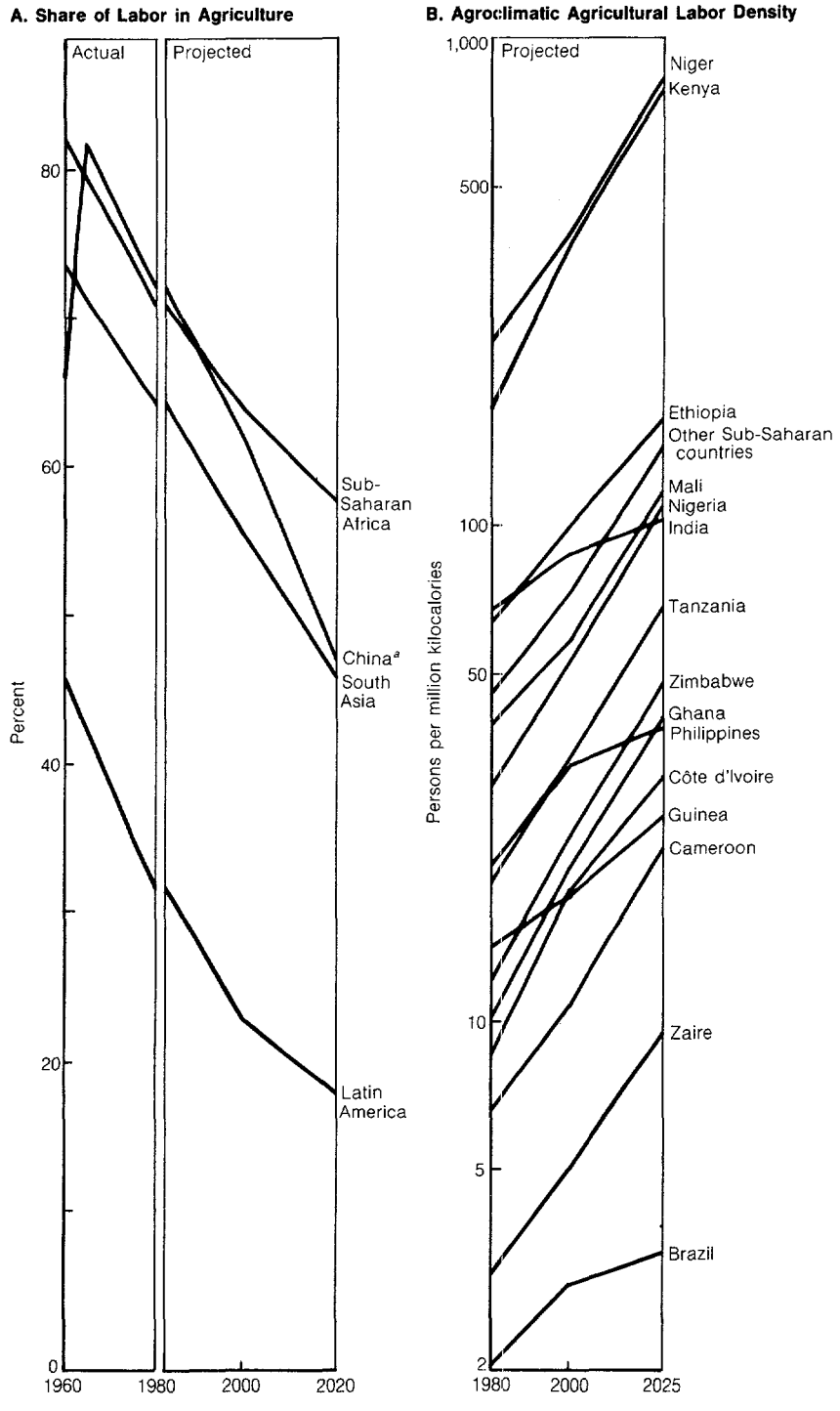
An alternative measure of the balance between land and labor endowments is the *agroclimatic labor density*, defined as the number of agricultural workers per million calories of production potential. Recent projections (Zachariah 1986) imply that the agricultural labor force in Sub-Saharan Africa will rise rapidly in future decades. Since the proportion of the labor force in agriculture is still very high and overall population growth is expected to be very rapid, pressure on land will grow even if the rest of the economy provides buoyant job opportunities. Figure 1 gives a picture of the likely outcome. The left panel shows that the proportion of the labor force in agriculture will decline in Sub-Saharan Africa, as in Asia and Latin America. Nonetheless, as the right panel shows, the agroclimatic labor density will shoot up in almost all African countries, at a much faster rate than in India or Brazil.

Population growth in Sub-Saharan Africa will average 3.2 percent a year in the 1980s, the fastest in recorded history. Even under favorable assumptions it will slow only marginally in the 1990s, to 3.1 percent. In the medium run the trend is not reversible, even if fertility falls sharply. Entrants to the labor market for the next fifteen years have already been born, and mortality is still falling steeply.

The rest of this article uses agroclimatic population density rather than agroclimatic labor density as a measure of land abundance. The former shows pressures on the demand side, as well as on the rural labor market, and is therefore a better indicator of the farming systems that will emerge in the years ahead. For African countries the two measures are, in any case, highly correlated.

Table 2 divides countries in Sub-Saharan Africa (and a few others) into three groups which will have low, medium, and high density in 2025. Low density is defined as fewer than 100 people per million kilocalories of potential production (and is roughly a quarter less than the density of 127 reached by Thailand in 1980). High density is defined as more than 250 people per million kilocalories of potential production, slightly below the density reached by India or Egypt in

Figure 1



a. China's labor force data are anomalous for the period 1957–63, when major economic reorganization was taking place.
Source: World Bank data.

Table 2. *Population Density by Climate, Selected Countries, 1987–2025*

Climatic category	*Low density*[a]	*Medium density*[b]	*High density*[c]
Humid lowlands			
Country	Guinea Bissau (2028)	São Tome and Principe (2041)	*Bangladesh*
	Malaysia (2091)	Sierra Leone (2054)	Mauritius
	Liberia (2051)		
	Equatorial Guinea (2088)		
	Zaire (2080)		
	Congo (2109)		
Share of Sub-Saharan countries in total Sub-Saharan population	8.7 percent	0.9 percent	0.3 percent
Mixed climates[d]			
Country	Côte d'Ivoire (2038)	Gambia (2031)	Kenya
	Chad (2041)	Zimbabwe (2032)	Rwanda
	Bahamas (2086)	Togo (2033)	*Barbados*
	Madagascar (2041)	Ghana (2036)	Burundi
	Argentina (2123)	Tanzania (2033)	Comoros
	Cameroon (2045)	Benin (2040)	Mauritania
	Brazil (2119)	*Costa Rica (2097)*	Ethiopia
	Zambia (2066)	Guinea (2072)	*India*
	Angola (2071)	Sudan (2065)	*Nepal*
	Central African Republic (2114)	Mozambique (2062)	Nigeria
	Gabon (2147)		Uganda
			Malawi
Share of Sub-Saharan countries in total Sub-Saharan population	12.8 percent	22.1 percent	46.3 percent
Arid or semiarid climates			
Country	None	Mali (2027)	Niger
			Somalia
			Lesotho
			Afghanistan
			Pakistan
			Egypt
			Namibia (1988)
			Senegal (2006)
			Mexico (2019)
			Botswana (2023)
			Burkina Faso (2024)
			Swaziland (2024)
Share of Sub-Saharan countries in total Sub-Saharan population	0 percent	1.8 percent	7.1 percent

Note: In each climatic category, countries are ranked by projected population density in 2000. Data are unavailable for the Sub-Saharan countries of Cape Verde, Djibouti, and Seychelles. Countries not in Sub-Saharan Africa are in italics.

a. Having less than 100 people per million kilocalories of potential production by 2025. Figures in parentheses denote the year a country is expected to reach a density of 100.

b. Having 100 people per million kilocalories of potential production currently or by 2025. Figures in parentheses denote the year a country is expected to reach a density of 250.

c. Having 250 people per million kilocalories of potential production currently or by 2025. Figures in parentheses denote the year a country that has not yet reached a density of 250 is expected to do so.

d. Includes climates with mostly intermediate rainfall and countries with both high- and low-rainfall zones.

Source: Binswanger and Pingali 1987.

1980. Medium density is the range 100 to 250 people per million kilocalories of potential production. In each group, countries are then subdivided into three climatic categories.

- *Mainly humid lowlands.* These countries range from Zaire in the low-density group to Bangladesh in the high-density group.
- *Countries with mixed climates or intermediate rainfall.* The bulk of Sub-Saharan African countries belong to this category. The countries are equally divided between low, medium, and high density. The medium-density countries have substantial pockets of inframarginally scarce land.
- *Arid and semiarid countries.* In our planning horizon, all but one of these countries will have high density or be on the way to doing so.

This methodology highlights the fact that semiarid zones are under much greater population pressure relative to their land endowments than are the humid areas. Migration from arid to wetter areas therefore makes sense, and is already happening on a substantial scale (sometimes across international borders).

The table shows that one-third of all Sub-Saharan countries—thirteen out of thirty-nine—will still have a low density in 2025, despite rapid population growth: Africa is a huge continent. Shifting cultivation will still be the most common system of farming in low-density African countries, particularly those with humid lowlands (the Republic of the Congo, Equatorial Guinea, Guinea Bissau, Liberia, and Zaire). However, in highlands with more moderate and healthy climates, population density will be greater. The highlands of Madagascar and Kivu province in Zaire are already densely populated, and annual cropping is the norm.

The medium-density group contains twelve countries. Of these, Sierra Leone is the only one dominated by humid lowlands, and Mali the only one in the semiarid tropics. In our planning horizon, shifting cultivation will gradually be phased out from this group, though it will still occur in regions with low population density.

Some twenty-one Sub-Saharan countries already have high density or will reach it by 2025. Eleven of them are in the semiarid zone. Nine have mixed climates and areas with good soil and intermediate rainfall. By 2025, the majority of Africans will live in high-density countries. Shifting cultivation will disappear completely. These are the countries where intensive agricultural techniques will have the greatest chance of success.

Agriculture Technologies

We will consider six kinds of agricultural techniques and see how useful they are in different regions and farming systems.

Input-Intensive Techniques

In sparsely populated areas of Sub-Saharan Africa, cultivation rights can usually be obtained free or for token payment. Land and labor are the only two inputs used in production. Such regions are dominated by subsistence farming, partly because market access is poor. In these areas, input-intensive techniques (such as the use of chemical fertilizers, pesticides, and high-yielding varieties) are not attractive to farmers. The cost of buying inputs is greater than any saving in labor costs that may result, and the farmer has no incentive to save on land costs.

Input-intensive techniques become cost-effective as population grows. Initially it becomes cost-effective to fertilize the soil with manure. Market access also tends to improve, especially if the transport system is developed; it becomes feasible for farmers to specialize in some crops and sell their surpluses. Land becomes relatively scarce, so land-saving technologies become more attractive.

New Crops and Higher-Quality Varieties

History shows that African farmers are willing to switch from subsistence crops to cash crops when marketing outlets are available. Even in thinly populated areas, farmers have often found it economic to shift to tree crops such as cocoa and oil palm. In many other areas they have diversified into cotton and groundnuts. They are also willing to move to new subsistence crops that expand their dietary choice or reduce the labor needed for subsistence production.

In areas dominated by shifting cultivation, the introduction of tree crops is attractive. When land is abundant it is cost-effective to plant more trees badly rather than improve the quality of trees already planted. As population density increases and infrastructure improves, land becomes more valuable, so it becomes economic for farmers to upgrade the quality of their plantations.

For existing crops, farmers are willing to adopt higher-quality varieties. For instance, they will switch from short-staple to long-staple cotton wherever the higher price of the latter compensates for the higher labor and other input costs. In the short run, such a shift is independent of land value. However, if the better crops turn out to be very profitable they will draw in immigrants, so land prices will rise. Cultivation techniques will then shift from extensive to intensive.

Stress-Resistant Varieties

The benefit of seeds that are resistant to drought, disease, and pests is independent of land and labor costs, so farmers are eager to adopt

them whether land is scarce or abundant. And they can benefit from such varieties even if it is not profitable to use fertilizers and pesticides. Resistant varieties do not require any extra labor. The only cost involved is for new seeds, and even that is often a one-shot cost when farmers can multiply the seeds locally. The importance of resistance to pests and disease is increasing in areas of high-yielding monoculture, as such areas are the most prone to attacks.

Research to improve stress resistance can have a high payoff. But the appropriate kind of stress-resistant varieties will depend on the agroclimate and ecology of each area. Drought tolerance may be important in semiarid areas but will be pointless for crops grown under irrigation. Pests and diseases vary from one area to the next, so research has to be carefully focused.

Labor-Saving Techniques

Generally speaking, tractors have been cost-effective where land is abundant and labor scarce (as in North America). Following that logic, many agricultural experts once thought tractors would be appropriate for Africa, too. But many tractorization projects failed, and Africa today is less mechanized than even the land-scarce, labor-abundant countries of South Asia.

The reason is that different farming systems require very different amounts of labor. There is no point in trying to introduce a labor-saving tractor in a system needing little labor. In shifting cultivation, tree cover is removed by cutting and burning; the tree stumps are simply left in the ground. The soil is soft and can be prepared with hoes or digging sticks. Since land is abundant, farmers can choose only the light, easy-to-work soils. Such realities help to explain why a labor-saving device like the plow is not used in labor-scarce forests, yet starts to be adopted in grass fallows where labor is more abundant. The number and intensity of operations are too low in forest fallow systems to justify plows. In addition, a plow can be used effectively only when farmers have removed some or all of the tree stumps on their plots. This arduous task is not worthwhile if plots are abandoned after a few seasons.

When infrastructure develops and farming becomes more intensive, mechanization starts to be cost-effective. Typically, the most power-intensive activities (like milling and water pumping) will be mechanized first. Then may come a shift from draft animals to tractors, provided various questions can be answered satisfactorily: (a) Will the savings in wages compensate for the high cost of a tractor? (b) Is credit available at an economic rate of interest? (c) What are the relative costs of fodder and diesel? (d) Is there reliable access to spare parts and servicing facilities?

In much of Sub-Saharan Africa, the answers to these questions lead farmers to prefer animals to tractors. Of seventeen projects attempting to leapfrog from hoes to tractors without the intermediate stage of draft animals, all but three failed (Pingali, Bigot, and Binswanger 1987). Most of the failures were in bush and semibush country, where the land is full of tree stumps and damages tractor-drawn implements. A jump from hoes to tractors has worked only in depression and valley bottoms that are periodically innundated with water, and in grassy savannas. Under these conditions there are no tree stumps. Soils in valley bottoms are often heavy, making them suitable for growing rice, provided plenty of power is available to prepare the land. If, in addition, labor is scarce and the infrastructure well developed, tractors can be a success. This has happened in Sudan and Zimbabwe and in pockets in other countries, but has usually been aided by heavy subsidies for mechanization. Whatever the conditions, tractors do little to boost yields. One study found that tractors failed to increase yields in ten out of fourteen cases of tractorization in Sub-Saharan Africa (Pingali, Bigot, and Binswanger 1987). Farmers who do mechanize do so mainly to save labor and extend their land, not to raise yields.

The use of other labor-saving devices such as herbicides will be economic only if the saving in labor outweighs their cost. Such innovations will succeed where wages are high and the cost of herbicides is low—neither of which applies in most of Africa.

Crop-Husbanding Techniques

Weeding is a simple technology that boosts yields and saves land. In forest and bush fallow systems, however, weeding is not needed in the first year of cultivation; once weeds start to proliferate, the plot is abandoned for a new one.

As farming systems develop into short fallows and permanent cultivation, weed problems increase sharply. Weeding becomes necessary, especially where organic fertilizers are used. It is most profitable where chemical fertilizers are involved, as it ensures that expensive nutrients are not wasted on fertilizing weeds. A similar pattern occurs with other types of husbandry, such as incorporating crop residues in the soil. As long as yields can be maintained simply by moving to another plot, farmers will not be interested in these techniques. But as land becomes scarce and valuable such techniques become important.

The cost-effectiveness of fodder management depends on the values of fodder, land, and labor. Where land is abundant, fodder has little value. Farmers will leave their harvested fields to be grazed by any animals, as it is not worth their while to harvest the residue for their own livestock. Where land values have risen and grazing land is

scarcer, farmers may allow in only their own animals and those of people who pay for grazing rights. As land and fodder values rise still more, farmers may find it cost-effective to store their residue and use it over the year for stall feeding. When fodder values rise even higher, farmers often find it cost-effective to grow fodder crops.

Land Improvements

Land improvements affect crop yields in three ways: (a) directly, as in the case of irrigation, drainage, and the application of lime; (b) as an essential component to fertilizers and high-yielding varieties; and (c) over the long term, by controlling erosion.

As with other yield-raising techniques, land improvements become economic only when land becomes relatively scarce. In forest and early bush fallows, farmers invest virtually nothing in land. When they use land more intensively, their first investments are to remove tree stumps and build well-defined boundaries. This generally happens in early grass fallows.

Where farmers can choose among different soils, they first cultivate the light, easy-to-work soils of the midslopes. As cultivation grows more intensive, farmers expand uphill to marginal lands, which they protect against erosion by ridging, tied ridging, and terracing. In the more densely populated parts of Sub-Saharan Africa such protective structures existed in precolonial times: examples include the Jos Plateau in Nigeria, the Mandara Mountains of Cameroon, the Kikuyu Highlands of Kenya, Mt. Kilimanjaro in Tanzania, Kigezi District in Uganda, Rwanda, and Burundi (Okigbo 1977, Morgan 1969, and Gleave and White 1969).

Antierosion investments are becoming increasingly common in intensively farmed areas of Africa. Machakos District of Kenya, for example, attracted many immigrants from the highlands between 1955 and 1965, and the farmers readily adopted bench terracing (Ahn 1977). However, where the easily cultivable soils of the midslopes are abundant, farmers are not interested in preventing erosion. And even when land is very scarce they fail to protect very marginal soils, where returns to antierosion investments are low, and widespread erosion damage occurs.

As population densities increase, farmers also move to the hard-to-work soils of the lower slopes and depressions. The heavy, waterlogged soils of valley bottoms and depressions often cannot be farmed until they have been drained and flooding has been controlled or irrigation has been provided. Thus, while land is lost in the marginal areas, high-qualilty land is being formed in previously unused areas. These heavier soils are particularly suitable for irrigated rice, which has become a major crop in Asia but not yet in Africa.

In Asia, small-scale irrigation and water control techniques are common. In large parts of semiarid India, gently rolling uplands are used intensively for rainfed crops. The runoff is stored in tanks and used for wet rice cultivation in the valleys and depressions. Although some of the tank systems have been in operation for hundreds of years, most were built in the late nineteenth and early twentieth centuries. In addition, many wells have been sunk, and the water pumped up to irrigate a second crop on the middle and lower slopes (Englehardt 1984). The ultimate form of water control is to be found on the meticulously terraced hillsides of Java and the Philippines, where in each rice field the required depth of water is stored and the excess drained into the field immediately below (Ruthenberg 1980). Sub-Saharan Africa is a long way from this, but parts of it are ripe for tanks and wells.

Beyond a point, the small irrigation schemes developed by farmers have to be complemented by state-supported, large-scale systems for expanding acreage and allowing land to be farmed more intensively. Such systems are worthwhile only where population is dense, since irrigated farming is labor-intensive. The frequent failure of large irrigation systems in Sub-Saharan Africa can be attributed partly to the reluctance of farmers to engage in labor-intensive production when they have other alternatives.

The Office du Niger scheme in Mali is a case in point. Coercive methods had to be used to bring in settlers. The 50,000 hectares that were developed by 1964 fell far short of the initial target of several hundred thousand hectares. Even in this limited area, the land was not farmed intensively enough to yield an output that would meet the costs of both settlers and the management of the scheme, provide farmers with a decent livelihood, and earn a return on the heavy capital investment (de Wilde 1967). Now that population density is increasing, the prospects are better.

Implications for Research and Technology Transfer

The previous section showed that Green Revolution techniques that have succeeded in the densely populated regions of Asia are unlikely to be adopted by farmers in large parts of Africa, where land is still abundant and market access poor. No matter how good research and extension is in such places, farmers will not be interested in fertilizers, irrigation, fertilizer-responsive seeds, elaborate crop husbanding, or land improvement and conservation. In such conditions, asking research and extension workers to propagate high yields is a recipe for demoralizing them.

Instead, farmers are more likely to be attracted by stress-avoiding technologies, new crops, and higher-quality varieties. These are the areas on which research should focus. Scientists should also try to

develop varieties that will boost yields without requiring fertilizers or irrigation. Such varieties will not produce dramatic breakthroughs, but are more likely to be adopted by farmers.

Past research efforts for land-abundant areas have often failed because the researchers did not understand shifting cultivation systems. Rather than trying to focus on a few specific issues such as product quality, and stress resistance, they often aimed at making the leap to high-yield, high-input farming long before such a system was cost-competitive with shifting cultivation.

These failures are well demonstrated by what happened to Uganda's research and extension efforts from 1910 to the mid-1960s (Carr 1984). The program was intended to develop and promote high-yielding varieties in conjunction with fertilizers, new techniques of crop husbandry, and better land management. Yet not one of the crops achieved any significant increase in yield at the farm level. Farmers simply did not adopt most of the proposed innovations. Nonetheless, they readily adopted new crops and a sequence of new varieties that improved and later maintained the quality of the cotton.

In the next century, Uganda's growing population will ensure that land becomes scarce and valuable. Then it will make sense to focus on yield-raising, land-saving strategies. Much of the research effort between 1910 and 1960 was almost a century too early. Such mistakes must be avoided elsewhere.

Another (though less serious) example of misdirected research came more recently, from the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) in West Africa. Its work on varieties of sorghum and millet initially emphasized the adaptation of fertilizer-responsive cultivars from India and did not focus on stress resistance. However, the Indian varieties did not have the resistance qualities of local varieties. Moreover, they were unable to outperform the traditional varieties with the small amounts of fertilizer that farmers were willing to use in dryland agriculture. ICRISAT's research strategy has now been changed toward stress resistance.

It is also important to curtail work on labor-intensive husbandry techniques for land-abundant farming. Decades of effort to introduce manures and crop residues have met with very limited success. Moreover, researchers must take into account the fact that the demand for labor is highly seasonal. The worst kind of husbandry techniques are those that increase labor demand in peak seasons (Ouedraogo, Newman, and Norman 1982).

The Strategy Evolves

Long before population growth makes land scarce throughout a country, some areas do become densely populated. They may be close to transport and marketing facilities, or have pockets of exceptional

soil or climatic advantages. For them, high-yielding research strategies are more appropriate. It is not surprising, therefore, that the big success stories of agricultural research come primarily from densely populated East African countries such as Kenya, or from tree crop areas where land is inframarginally scarce.

By concentrating research on such environments, several advantages are gained. The relevance of research is maximized. Limited research staff and resources are focused on a limited range of issues, and hence are more effective. Researchers have to solve some basic problems in adapting genetic material to local conditions, which will benefit more regions as land grows scarcer.

Just as Asia's Green Revolution has been most successful in irrigated areas or where rainfall is reliable, so irrigation will be necessary in much of Africa too if that continent is to have its own Green Revolution. However, irrigation projects in Sub-Saharan Africa are notoriously expensive (see below).

By contrast, areas with reliable rain and good soil are well placed to absorb high-yielding technologies without irrigation: many parts of Rwanda, Burundi, Kenya, and Nigeria fit this description. If agricultural prices are remunerative and not depressed by discriminatory government policies, farmers will be interested in buying inputs and developing their crop husbandry. Many will spontaneously improve their land and dig wells. The process can be accelerated by providing extension services and credit.

Another case for regional targeting involves the humid lowlands, which often have chemically and structurally fragile soils. If such soils are cultivated intensively, the results can be rapid leaching, soil acidification, and erosion. Large amounts of fertilizer and lime are needed to maintain soil structure and fertility, while large amounts of labor or machinery are needed for weeding and other husbandry (Ruthenberg 1980, Lal 1983, Kang and Juo 1981). Since all these activities are expensive, it is hard for those farming these poor soils to produce goods at competitive prices. Subsistence cultivation is therefore the rule, except where infrastructure makes tree crops economic.

The big challenge for researchers is to devise systems that can produce crops at a price competitive with other agroclimatic zones. The paucity of past successes suggests that this may not be possible for some of the soils in Africa, so it is essential to concentrate research on the more promising environments. Other areas can still be helped, but not necessarily by research. In several low- and medium-density countries, for example, the provision of infrastructure can help expand acreage and facilitate a switch to tree crops.

In high-density countries labor-saving innovations are much less relevant than yield-raising ones. Mechanization will generally be cost-effective for such power-intensive operations as milling and pumping.

For control-intensive operations (such as harvesting), however, mechanization will be economic only when wages rise substantially (Binswanger 1986). Until then, it will often be appropriate for farmers to use tractors for tillage, animals for weeding, and labor for harvesting. Man, animal, and machine will be complements, not substitutes.

The policy message from this analysis is clear. Governments should try to create a distortion-free environment that allows farmers to choose the most cost-effective combinations. Governments should refrain from subsidizing or otherwise pushing any particular form of mechanization.

Implications for Projects and Infrastructure

The same logic that governs the relevance of research also applies to infrastructure projects. Where land is abundant and cultivation shifting, it is a mistake to invest heavily in projects attempting to raise the productivity of land. Even if irrigation is provided cheaply, farmers will make little use of it, as irrigation involves a lot of labor. For low-density areas with good land, roads are by far the most relevant form of infrastructure. They provide access to markets and allow people to migrate to places where farming is most remunerative.

However, infrastructure does not always lead to a greater concentration of population. Farmers may prefer to move from densely populated to thinly populated areas, to overcome local shortages of land. It is a mistake to try to force people to congregate in certain areas and take up intensive farming (as was attempted in the Ujaama experiment in Tanzania). Where land is abundant, it can be more cost-effective to undertake extensive cultivation.

Given the high cost of irrigation and land improvement in Sub-Saharan Africa, such projects should be undertaken only where land is scarce, population densities are relatively high, and good infrastructure and marketing facilities exist. The obsession with high yields that many specialists from industrial countries and Asia bring to Africa can be as counterproductive in projects as in research.

Large-scale irrigation projects in Africa typically cost several times more than their equivalents in Asia. One reason is that Sub-Saharan Africa lacks the ample, skilled labor and low-cost technical and managerial staff of Asia, which means that cheap, labor-intensive construction is not feasible. Expensive labor-saving equipment has to be brought all the way from Europe, North America, or East Asia. The projects are usually staffed by expensive expatriate managers and technicians. Until project costs are reduced dramatically, irrigation in Sub-Saharan Africa will be cost-effective only for private wells, lift irrigation, and minor impoundment and diversion schemes.

One factor that could be favorable to irrigation (though not to human welfare) is that labor costs are unlikely to rise much and may

even decline in many parts of Africa in the coming decades. A rapidly growing population means that farmers become willing to engage in labor-intensive irrigated agriculture. If education and training also expand to create skills in construction, engineering, and management, African countries can adopt cheap Asian construction techniques. Meanwhile, other engineering solutions must be explored to bring costs down. The technical potential for irrigation in Sub-Saharan Africa is large. Even the Sahel has large river systems, such as the Senegal and Niger, which can be used to irrigate substantial areas.

In flood plains and valleys in humid areas where the soil is good, drainage can be cost-effective. Such areas are often suitable for growing rice, which has already begun in Guinea, Sierra Leone, Senegal, the Niger valley, and the basin of Lake Victoria. In Sukumaland, Tanzania, the flood plain was used only for grazing forty years ago (Rounce 1949); today it is sown completely with rice. Investment in drainage increases the amount of land available for cultivation, and so becomes cost-effective when land values rise. It also reduces health hazards and attracts labor—essential, in large numbers, for rice farming.

Investments in infrastructure are vital. But they must be selective, to make the best use of limited funds and staff. It is tempting for African governments to try to spread infrastructure uniformly over every district. However, building roads in areas with poor soil does little to help agriculture: farmers in such areas cannot grow cash crops or tree crops at competitive prices and will tend to continue with subsistence cultivation. By contrast, the areas with the best land and climate offer the quickest returns on infrastructure. They are the places where farming will be most profitable, immigration will take place most rapidly, advanced agricultural technologies will most readily be adopted, and where the linkages between farming, services, and industry will develop best. In such areas, agricultural research and infrastructural investment will reinforce each other, and the results will be striking.

Abstract

The article examines the suitability of different agricultural research strategies in African countries with varying endowments of land, labor, and climate. Differences in such endowments lead to a wide spectrum of farming systems. Agricultural technologies that are cost-effective in some farming systems are not in others. Many past failures are due to a mismatch between technological strategies and farming systems. The article classifies countries of Sub-Saharan Africa on the basis of agroclimatic density and suggests appropriate technological strategies for each class of countries.

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EDUCATION AND DEVELOPMENT
A Review

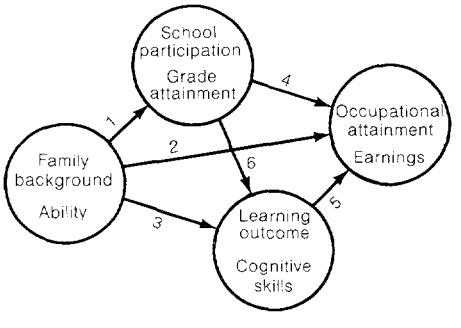
George Psacharopoulos

That education is a form of investment that can contribute to individual and social development is not a novel idea. Over two centuries ago Adam Smith wrote:

> A man educated at the expense of much labor and time... may be compared to one... expensive machine... The work which he learns to perform... over and above the usual wages of common labor will replace the whole expense of his education (1776, p. 101).

Articles on education as investment appeared sporadically in the first half of this century (for example, Strumilin 1929, Walsh 1935). But it was not until the late 1950s that the subject became a separate field of study—the economics of education. The spur was the realization that not all the increases in national output could be accounted for by the growth of conventional inputs: physical capital, labor, and land. The "residual" puzzle in growth accounting was solved by Schultz (1961a) and others, who introduced human capital into the aggregate production function.

Figure 1



One way of analyzing the complex links between education and development is illustrated in figure 1. The direct relationship depicted by arrow 4—from school to the labor market—is known as the "external efficiency of education" and has received most attention in the literature, mainly from economists. The triangular path (arrows 1, 3, and 6) from family background to schooling and learning outcomes is known as the

"internal efficiency of education" and has been studied mainly by sociologists and psychologists. In recent years, the availability of longitudinal data sets has permitted some attempts to estimate the full model.

The first section in this article presents some of the principal findings on the role of education in development that have been generated in the past twenty years. The following section deals with a series of debates that have appeared in the literature. The final section attempts to draw some policy implications for educational priorities in developing countries.

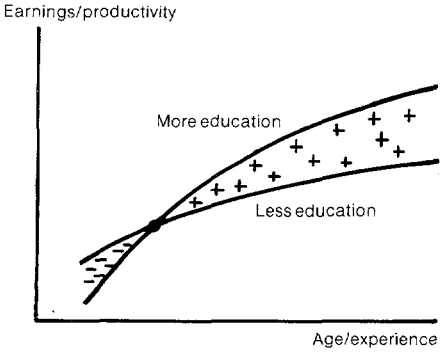
The Evidence

This review is restricted to the effects of education most directly related to a common notion of economic development. One is efficiency in resource utilization, leading to higher income; another is more equitable distribution of such income.

Labor Market Outcomes

There is widespread evidence that an individual's earnings increase with each extra year of schooling. The explanation of human capital theory is that education makes the individual more productive, not only in the market place but also in the household. As Welch (1970) and Schultz (1975) have put it, education has a beneficial allocative effect or helps the individual to deal with disequilibrium situations.

Figure 2



The empirical core of the human capital school lies in the crossover shown in figure 2—the tradeoff between a low level of education and earnings today versus more education and earnings tomorrow. Such a relationship has been documented in practically every country that has data on age-earning profiles by education. (See the appendix for examples from the latest Brazilian census.)

Proper discounting of the costs and benefits associated with educational investment (the minus and plus areas in figure 2) leads to estimates of its profitability from both the private and social point of view. Like the rate of return to any other project, the return to educational investment is the discount rate that sets the net present value of the net stream of benefits equal to zero. In a state subsidized system the cost of education to the individual is the earnings forgone while in school. From a social viewpoint, however, the cost of education must include all resources used to provide education (for example, teachers' salaries and the use of classrooms).

Estimates of the returns to education are now available for over sixty countries. Table 1 gives a regional summary and raises several noteworthy points.

- The social returns to education in developing countries are at least as high as any reasonable measure of the opportunity cost of capital or a social discount rate. In other words, investment in people may be more conducive to economic growth than investment in machines.
- Rates of return are highest in primary education, followed by secondary and then university levels. For primary education, unit costs are small relative to the extra lifetime income or productivity associated with literacy. For university education, the opposite is true.
- The same diminishing returns apply across countries: the more developed the country, the lower the returns to education at all levels. The high returns to education in low-income countries must be attributed to their relative scarcity of human capital.
- Private returns are higher than social returns at all levels—a result of the public subsidization of education in most countries. The discrepancy between private and social returns is greatest at university level—which raises issues of equity as well as of how educational expansion should be financed.

Other studies have estimated rates of return by field of study and by sex. Table 2 shows that technical education and agronomy are associated with lower returns than the more general subjects—a counterintuitive result that is again due to the relatively high unit cost of technical education (Psacharopoulos 1987a). And table 3 shows that the rate of return is higher on women's education than on men's. Although in all societies the absolute earnings of men are higher, the opportunity cost of study for women is often lower than for men, and

Table 1. ***The Returns to Investment in Education by Country Group and Level of Schooling***
(percent)

	Social return			*Private return*		
Country group	*Primary*	*Secondary*	*Higher*	*Primary*	*Secondary*	*Higher*
Africa	26	17	13	45	26	32
Asia	27	15	13	31	15	18
Latin America	26	18	16	32	23	23
Intermediate[a]	13	10	8	17	13	13
Industrial	—	11	9	—	12	12

—Not available because of lack of a control group of illiterates.

a. Refers to South European and Middle East countries. Figures are averages for fifty-eight countries and mainly refer to the late 1970s.

Source: Psacharopoulos 1985, p. 586.

furthermore women's education allows them to participate in the labor force in the first place.

Growth Accounting

If expenditure on education produces a high social rate of return, macroeconomic analyses should pick up on the link between the expansion of education and economic growth. This issue has been extensively studied, following the pioneer work of Schultz (1961b) and Denison (1967). Their approach, called "growth accounting," breaks down a country's economic growth into various contributory factors, such as investment in physical capital, growth in the workforce, and investments in human capital. (The growth in agricultural land has not been found to be a major source of growth.) As table 4 shows, such macro evidence bears out the microeconomic links between education and earnings. The same relationships have been studied by economic historians, who relate the literacy level of a country to cycles of growth. For example, Saxonhouse (1977), in a study of the Japanese cotton spinning

Table 2. ***The Social Returns to Education by Level and Field of Study***
(percent)

Educational level	*Field of study*	*Rate of return*
Secondary school curriculum	General, academic	16
	Technical, vocational	12
University faculty	Law, economics, social sciences	12
	Engineering	12
	Agronomy	8

Note: Rate of return figures are averages for seven countries and are based on data mainly from 1980.
Source: Based on Psacharopoulos 1985, tables 6 and 7.

Table 3. ***The Returns to Education by Sex***
(percent)

Sex	*Rate of return*
Males	11
Females	15

Note: Figures are mainly private rates and refer to the coefficient of the average year of schooling estimated by means of Mincer's (1974) semilogarithmic earnings function in sixteen countries during the late 1970s.
Source: Based on Psacharopoulos 1985, p. 588.

Table 4. *The Contribution of Education to Economic Growth by Region*

Region	*Percentage of growth rate explained by education*
Africa	17.2
Asia	11.1
Latin America	5.1
North America and Europe	8.6

Note: Figures are simple country averages within regions and mostly refer to economic growth in the 1950s and 1960s.
Source: Based on Psacharopoulos 1984b, table 8-2.

industry from 1891 to 1935, found that education, among other factors, had a large and significant impact on productivity growth. Easterlin (1981) examined data for twenty-five of the world's largest countries and concluded that the spread of technology depended on the learning potentials and motivation that were linked to the development of formal schooling: in other words, that the most likely causal link is from education to economic growth, not the other way around.

Income Distribution

Since education has such a strong bearing on individual earnings, it must also affect the way income is distributed. The net effect of the expansion of schooling has been a reduction in the dispersion of earnings and hence a more equal income distribution. (The appendix gives an exemplary income distribution by education in Brazil.)

This equitable effect, however, strongly depends on which level of schooling is expanded. The equity impact is highest for basic education, since the low earnings of otherwise illiterate workers are raised nearer to the overall mean. But if university education is expanded (and especially postgraduate education), the equity effect may be negative, in the sense that a group of workers with earnings above the mean are raised even further away from it. Taking Mexico as an example, Marin and Psacharopoulos (1976) report that providing primary education to 10 percent of those without it would make income distribution more equal by nearly 5 percent compared with the present level of an inequality index. Giving higher education to 5 percent of those with secondary education, however, would worsen the inequality index by 2 percent. Since most university students come from the higher-income groups in any society, state subsidies for their education will boost their future earnings at the expense of the general taxpayers, who are less

likely to enroll their children in higher education. Table 5 shows that in four countries the children of the upper-income groups received the bulk of the higher education subsidy.

The Debates

The views of the human capital school have long been the subject of considerable controversy in the literature. The same positive correlation between education and earnings could also be predicted by several other theories, which, if valid, would weaken the "education-for-development" proposition. Especially vulnerable in this respect has been the link between earnings and productivity. For if the higher earnings associated with more schooling do not have a productivity counterpart, the social payoff of investment in schooling would vanish.

Screening

Among the many arguments that earnings may not reflect productivity, perhaps the most elaborate is the one known as the "screening hypothesis" (Arrow 1973). Employers prefer, and pay higher salaries to, the more educated because the employers use schooling as a proxy for various unobserved characteristics that such employees will in fact be more productive. To the extent that those with greater natural ability receive more years of schooling, the higher earnings of the more educated are due to their greater genetic ability rather than to their education. According to some estimates, the social rate of return to investment in schooling should be halved when screening is taken into account (Taubman and Wales 1973).

Although this theory sounds plausible, many attempts to test it have failed to produce any support for it. Early evidence by Griliches (1970) has shown that the inclusion of measured ability in an earnings function does not diminish the importance of schooling in determining earnings (see also Layard and Psacharopoulos 1974). The same

Table 5. ***The Share of Higher Education Subsidies to Different Income Groups in Selected Countries***
(percent)

Country	*Survey year*	*Income group*		
		Lower	*Middle*	*Upper*
Chile	1983	15	24	61
Colombia	1974	6	35	60
Indonesia	1978	7	10	83
Malaysia	1974	10	38	51

Source: World Bank 1986, p. 61.

result was repeated in two recent studies of Kenya and Tanzania (Boissiere, Knight, and Sabot 1985). And where the outcome of education is measured directly by the value of extra output (by means of an agricultural production function) rather than by extra earnings, it has been found that the effect of schooling is substantial. According to a review by Jamison and Lau (1982), four years of education raises agricultural productivity by 9 percent over what it would be with no education. Such a benefit, when it is combined with the low cost of providing primary education, confirms the relatively high rate of return to primary education.

Public versus Private Sector

Another way of shadow pricing education is by observing the earnings of those employed in the competitive parts of the economy (for example, the private sector or self-employment). Private employers cannot keep on paying a wage much higher or lower than what a particular employee contributes to production: if they do, they will either incur unsustainable losses or the employee will leave. Table 6 shows that the returns to investment in education, as estimated for those employed in the competitive sectors, are higher than those for the economy as a whole. The reason for such finding is that civil service pay scales have a tendency to narrow the earnings dispersion, especially by paying above their marginal product those with the lowest level of schooling (Psacharopoulos 1983). Furthermore, in self-employment, where no screening takes place, standardized labor earnings for other inputs used by enterprises in the informal sector must reflect the value of education in production.

Segmentation

Another popular debate in the economics of education comes under the heading of labor market segmentation, or duality (Gordon 1972).

Table 6. ***The Private Returns to Education by Sector of Economic Activity***
(percent)

Economic sector	*Rate of return*
Private	13
Public	10

Note: The figures are averages for eleven countries, estimated by the Mincerian earnings function and refer mainly to the late 1970s.
Source: Based on Psacharopoulos 1985, table 4.

The starting point is the proposition that there are good jobs and bad jobs. Whereas education helps those in good jobs to achieve high pay, it does not do so for those who are locked in bad jobs with few promotion prospects.

Empirical tests of this descriptive proposition have suffered from a statistical artifact most lucidly expressed by Cain (1976). By fitting earnings functions within low-pay bad jobs and high-pay good jobs, one necessarily truncates the income-dependent variable of the latter group and finds a lower effect of education on earnings.

In fact, the labor market is a continuum, with no clear line separating the alleged segments. In addition, many workers, by acquiring more education, have been able to cross over to the higher segment—something they could not otherwise have achieved. The issue is mobility, which can be examined only with longitudinal data—whereas most attempts to test for labor market duality have been based on cross-sectional data. But Chau tests on the difference between two sets of coefficients on an earnings function fitted to a split cross-sectional sample (usually by occupation) say nothing about how education may assist an otherwise low-paid worker to move up to the other group (Psacharopoulos 1978; Corbo and Stelcner 1983).

Declining Returns over Time

In the mid-1970s, some people expressed fears that the world may be overeducated, in the sense that schooling had expanded beyond a normative optimum (Freeman 1976, Dore 1976). Such fears continue to be voiced today regarding educational expansion in developing countries. Whereas education was a socially profitable investment in the 1960s, it might not be in the 1990s.

This issue is settled rather easily by looking at the rare instances where the returns to education have been estimated within a country for more than one year. As shown in table 7, the profitability of investment in education, like that for any other type of investment, declines over time as educational expansion takes place. However, the decline is far from drastic. It took ten years for the rate of return in Brazil to drop from 16.5 percent to 14.5 percent. During the same period the mean years of schooling completed was raised from 3.9 years to 5.7 years. Building the stock of human capital by means of annual flows of graduates is a very slow process (Psacharopoulos and Arriagada 1986).

The interaction between shifts in the supply and demand for educated labor is what Tinbergen (1975) described as the race between education and technology. Whereas school expansion increases the supply of graduates and thus tends to lower the rate of return, technological demand for more sophisticated skills keeps pace with the

Table 7. *The Private Returns to Education at Two Points in Time in Selected Countries*

(percent)

Country	*Survey year*	*Rate of return*
Brazil	1970	16.5
	1980	14.5
Colombia	1965	17.3
	1978	14.4

Source: Brazil, from Psacharopoulos 1985, table 4; Colombia, from Mohan 1981, p. 40.

Table 8. *The Changing Composition of the Labor Force in Selected Countries*

		Percentage of the labor force		*Mean*
Country	*Year*	*With no education*	*With higher education*	*years of schooling*
Brazil	1960	48.2	0.5	2.4
	1980	24.7	5.9	5.6
Chile	1969	18.6	2.3	5.9
	1981	4.1	8.3	8.1

Source: Psacharopoulos and Arriagada 1986, p. 572.

increased supply. The net result of such a race is an elastic "reduced form" set of intersections of the supply and demand for educated labor.

Supply shifts of educated labor have been impressive in the years since World War II, and especially during the 1960s in developing countries. Table 8 shows, as an example, the changing composition of the labor force in two Latin American countries.

Educated Unemployment

Fears are often expressed that the expansion of education produces unemployed graduates. It is true that the transition from school to work has been exacerbated in recent years, mainly because of sluggish economic growth. Nonetheless, the "product" of education will last fifty years—the working time of the individual concerned. There is no evidence that any person who is willing to work remains idle for fifty, forty, or even five years. The incidence of unemployment is a sharply declining function of age or time since graduation; virtually everyone finds a niche within a matter of weeks or months (Psacharopoulos and Sanyal 1981). In one branch of economics, at least, the period

between graduation and landing a job is interpreted as waiting time, in the sense that an "unemployed" person makes a voluntary decision to remain out of work so that he or she can search for a better job or salary rather than accept the first available (Stigler 1962). In Indonesia, for example, it was found that job search among secondary school graduates yields a 21 percent rate of return (Clark 1983).

Radical Interpretations

The Marxist school of radical economics puts a completely different interpretation on the education-earnings relationship. It sees education as a means by which the dominant social class perpetuates the status quo from generation to generation (Bowles 1972). By providing schooling to its offspring, the income earning power and economic dominance of that class will be sustained. Schools also enhance certain qualities of docility that are rewarded by employers; they do not impart productivity-boosting skills (Bowles and Gintis 1975).

Of course, more educated parents will seek to give their children at least as much education as they themselves have received. This is a global phenomenon, widely studied by sociologists (for example, see Jencks and others 1972). But this does not necessarily deny the productivity value of education—it is more an issue of how education was acquired in the first place and by whom. Research on social mobility has demonstrated that education helps many children of modest social origins to reach the highest occupational classes and income groups (Anderson 1987).

Quality versus Quantity

Most of the evidence on the developmental effects of education refers to the extensive margin, that is, to the number of years of schooling of the labor force. Evidence on the intensive margin—the quality of education provided—is scarce. (For one attempt, see Behrman and Birdsall 1983). The reason is that, in developing countries, longitudinal data sets that follow the student from school to adult life and measure economic performance are rare. Furthermore educational quality means different things to different people. First, there is the traditional input definition, by which higher expenditure per pupil or a lower repetition rate are indicators of good quality. But throwing money at schools does not necessarily mean that such money will be used efficiently, and automatically promoting everyone in a class does not mean that graduates will (at least) have been made literate. Second, there is the output definition of educational quality, based on the students' learning achievement. But because so many factors other than schooling (for example, prior cognitive knowledge and family

background) correlate with cognitive achievement in a cross section, it is difficult to isolate the particular effects of education. However, extensive work with the so-called educational production functions has resulted in the conclusion that, although family factors are associated with achievement, specific educational inputs, like the availability of textbooks, do have a net effect in raising achievement (Heyneman and Loxley 1983).

Educational Strategies

In education, as in any other field, universal policy prescriptions simply do not exist. The strategy and tactics of education depend upon the initial conditions in a particular country, which means that whereas policy A is suitable for country X, policy B may be more suitable for country Y. Given this qualification, the accumulated evidence in the economics of education in the past thirty years permits some broad policy generalizations. The list which follows is conservative, in the sense that, unless the initial conditions in a given country dictate otherwise, the propositions may be applicable to a large number of countries.

Emphasis on Primary Education

For the poorest countries, perhaps the safest strategy is to increase primary education coverage for children age six to fourteen. Such investment has the highest social rate of return, and unless a population is literate, other (physical) investment projects may fail (Mingat and Tan 1987). In addition to direct economic returns, primary education is associated with larger externalities than any other social investment: suffice it to mention the creation of a more informed electorate. Haveman and Wolfe (1984) have identified many nonmarket benefits of education, including better decisions around the home, better sanitation, more leisure time, more efficient consumption, and even better choice of a marital partner. When such effects are priced, the standard estimates may capture only half of the total value of schooling.

Emphasis on General Skills at the Secondary Level

As development takes place and primary education becomes almost universal, the next frontier for educational policy is secondary schools. Although some countries were tempted to vocationalize such schools in order to make them relevant to the world of work, the results have not always matched expectations. For example, in a recent evaluation of two systems of diversified secondary education (Colombia and Tanzania), most of those who studied agricultural or industrial subjects were found, one to three years after leaving school,

in jobs such as office clerk, which were unrelated to their training. Their activities did not differ from those of a control group of general education graduates (Psacharopoulos and Loxley 1985).

Such evidence, coupled with the high unit cost of vocationalizing the curriculum, favors the more conservative policy of emphasizing general skills—like science and mathematics—in secondary education. The unit cost of teaching such subjects is relatively low, and the graduates are flexible enough to fit into a variety of occupations or go on to study in a variety of fields.

Emphasis on Employment-Based Vocational Training

The urge to modernize and industrialize has led many countries to emphasize the creation of technical and vocational skills in the labor force. Such emphasis is fine, although it raises the question of where vocational training should take place. The evidence suggests that employment-based training has an advantage over the same type of training done in formal schools. Latin American countries have relied extensively on employer-financed training in institutions like SENA in Colombia, SENATI in Peru, and SENAI in Brazil. A recent evaluation in Colombia has revealed that the social rate of return to investment in SENA courses is 14 percent, well above that from investment in formal secondary technical education. And the profitability of on-the-job training was found to increase with the years of general education a worker has (Jimenez, Kugler, and Horn 1986).

Employers know more about the demand for labor than the formal school system does, and they are better placed to follow technological developments in a variety of occupations. And the costs of on-the-job training are usually shared between the employer and the employee, whereas school-based training is typically financed by the taxpayer.

Of course, this does not mean that all vocational institutions would disappear. Proprietary schools offering commercial or industrial subjects would certainly remain; people enroll in them voluntarily, are willing to pay for their courses, and thereby help to ensure the relevance of what they offer. These qualities give them a considerable edge over public vocational schools, which are usually regarded as an inadequate alternative to academic institutions.

Emphasis on Cost Recovery in Higher Education

At the highest level of education, cost recovery is the most promising policy for both efficiency and equity reasons. Too much of a typical education budget is devoted to the university level, which has the lowest rate of return, and a disproportionate number of students come from the more affluent parts of society (World Bank 1986).

Some sons and daughters of poor farmers make it to the university, but they are the exceptions that prove the rule. Yet attendance at the university is typically free, and students may even receive a cash allowance. If students pay at least part of the cost of their education, they are more likely to make better choices on whether to enroll and what to study. For the talented poor, selective scholarships or loans can be provided (Mingat and Tan 1986).

Along with cost recovery, universities could adopt more traditional efficiency measures, such as the consolidation of dispersed campuses into larger units. Economies of scale apply as much to university campuses as to industrial plants. The average cost per student declines sharply once enrollment exceeds 500 (Psacharopoulos 1982).

Emphasis on School Quality

There is no point in enrolling every six- to fourteen-year-old in school if many who leave school at fifteen do not know how to read and write. International comparisons of reading, mathematics, and science show that students in developing countries achieve only a fraction of what their peers manage in industrial countries (Heyneman and Loxley 1983).

Money alone does not improve the quality of education (Hanushek 1986). It needs to be concentrated on buying those inputs that are cost-effective in raising the level of student achievement. One such quality booster is the availability of textbooks, along, of course, with teachers qualified to use them (Lockheed, Vail, and Fuller 1987). In parallel, a system of examinations will allow the authorities to monitor who learns what and to take corrective measures if, say, elementary reading and arithmetic standards are dropping.

Deemphasis on Planning Models

Since the early days of educational policy, it has been popular for countries to attempt to plan their educational systems by means of formal models. The most widely used model has been the one known as manpower forecasting, based on a set of fixed relations between the anticipated growth in output and the educational or skill requirements to produce such output (Harbison and Myers 1964). For example, if the historical elasticity of the growth in higher education enrollment and GDP growth is equal to 1, and a country's twenty-year plan anticipated GDP growth of 7 percent a year, then university enrollments should also grow by 7 percent a year. The epitome of such models is found in the Mediterranean Regional Project of the Organisation for Economic Co-operation and Development (OECD), which was also extended to Latin America (see Parnes 1962 and OECD 1967).

In practice, forecasts and outcomes have differed enormously. This is not surprising: technological change and its implications for the demand for skills have been too elusive to predict, and the absence of price and, especially, wage elasticities in the model reduced it to a mechanical application with no practical interest. (For a critique see Psacharopoulos 1984a.) The trend is therefore away from such formal models. They are being replaced by a recognition that what matters is the individual demand for education by students and their families responding to wages and other market signals.

Emphasis on Analytical Work Specific to Countries

Universal policy prescriptions do not exist, but the general principles outlined in this article can be fine-tuned to the conditions in each country. It may be that, although in most developing countries primary education should receive priority, in country X it is the secondary level that offers a higher rate of return. Or it may be in country Y that university faculty should be expanded.

Once a country has decided that, for example, primary education is a priority, it faces a series of options on how to go about increasing its supply. First, how much primary education to provide: four years, five years or perhaps, nine years? The answer will depend on how long is needed to instill literacy in the students. Four years combined with the provision of a qualified teacher and a textbook for each student may achieve more than eight years of education with an untrained teacher and only one textbook to a class. Then there is the question on how to attract students. It is well known that simply building schools in a rural area does not ensure that children will enroll in them. Perhaps a subsidy, say in the form of free lunches, would offset some of the opportunity cost of child labor and thus make parents willing to release them from agricultural activities.

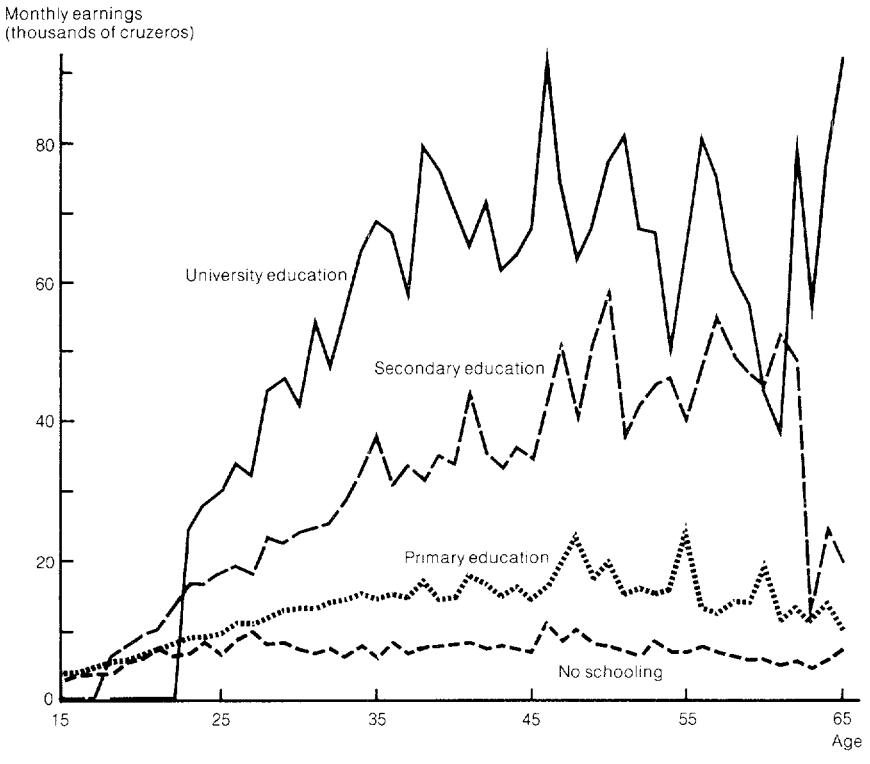
Such issues need to be studied carefully, which in turn requires a critical mass of social scientists to document and monitor relationships in the system, so that the most appropriate educational policy is adopted. However, few Ministries of Education have analytical units linked to the decisionmaking process. Efforts to develop them may be one of the best preliminary investments available.

Concluding Comment

There are many strategies for development, each surrounded with controversy. On the issue of human versus physical capital investment, the classic examples in the early literature were India and Japan (Schultz 1961b). The crash investment in steel mills in India was not accompanied by sustained growth, whereas Japan's emphasis on education since the Meiji set the foundation for its economic miracle.

Of course, it is not easy to establish cause and effect in development economies—too many factors change at the same time. Yet this review of the evidence provides grounds for confidence that investment in education is a major contributor to development.

Appendix: Education and Income in Brazil



Earnings category in multiples of minimum wage	*Mean years of schooling*	*Mean earnings (cruzeros a month)*	*Frequency (percent)*
Below 1/4	2.8	828	0.8
1/4–3/4	3.1	2,401	7.4
3/4–1	3.6	3,848	10.4
1–2	4.1	6,143	32.8
2–3	4.9	10,326	17.0
3–5	6.1	16,518	15.5
5–10	8.7	29,870	9.9
10–15	10.9	51,543	3.2
15–20	12.2	73,595	1.2
20 and above	13.0	149,785	1.8
All earnings categories	4.3	15,105	100.0

Note: Data for the table and figure are based on the public use tapes of the 1980 Brazilian Census. Distribution refers to urban males.
Source: Psacharopoulos 1987b.

Abstract

The article reviews the evidence on the role of education in economic development, with emphasis on issues that have appeared in the literature in the past two decades: the contribution of education to economic growth, the screening hypothesis, the segmentation of the labor market, the return to investment in schooling, and the effects of education on unemployment and income distribution. It concludes with an optimistic assessment of the contribution of educational investment to the development process, especially when such investment is targeted to primary schooling, general education, and improvements in the quality of instruction and when it is accompanied by cost-recovery at the higher levels of education.

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