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Market Behavior of Grains Exporters

Donald O. Mitchell and Ronald C. Duncan

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A Policy Perspective**

Mohsin S. Khan

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Market Behavior of Grains Exporters <i>Donald O. Mitchell and Ronald C. Duncan</i>	3
Macroeconomic Adjustment in Developing Countries: A Policy Perspective <i>Mohsin S. Khan</i>	23
Some Theoretical Aspects of Agricultural Policies <i>Joseph E. Stiglitz</i>	43
Macroeconomic Policy and Trade Liberalization: Some Guidelines <i>Michael Mussa</i>	61
Management of Public Industrial Enterprises <i>Mahmood A. Ayub and Sven O. Hegstad</i>	79
Recent Publications	103

to increase their market share by bidding away sales from the United States.

The behavior of the United States in the grains markets has important implications for all other exporters. As long as the United States, or any other country, behaves like the price leader, others can export at the price it sets. This opportunity has been used to advantage by Argentina in wheat and coarse grains, by South Africa in coarse grains, and by China and Pakistan in rice.

The Characteristics of Grains Exporters

Grain exports are dominated by a few countries. In 1979–81 the five largest exporters in each market provided almost three-fourths of the world's rice exports, more than nine-tenths of wheat exports, and about seven-eighths of coarse grain exports. The United States was the largest exporter (see table 1). This dominance by a few countries has led various writers to describe the grain markets as oligopolistic, with price leadership provided by one or more of the big exporters. McCalla (1966) characterized the world wheat market as a duopoly between Canada (the price leader) and the United States. Alaouze, Watson, and Sturgess (1978) defined the wheat market as a triopoly of the United States, Canada, and Australia. Bredahl and Green (1983) suggest a model for coarse grain exports, in which the United States is the residual supplier.

The structure of the grain markets acquires increased significance during a period, such as now, when stocks are high and prices low. The behavior of each big participant then becomes more important to the others. With a perfectly competitive market, all exporters will share

Table 1. Average Market Shares of the Five Largest Exporters of Rice, Wheat, or Coarse Grains, 1979–81
(percent)

<i>Country or group</i>	<i>Rice</i>	<i>Wheat</i>	<i>Coarse grains</i>
United States	23.2	45.3	65.3
Thailand	24.4	—	—
Canada	—	17.5	5.4
Australia	—	12.6	3.7
Argentina	—	4.4	9.7
EC-10	—	14.4	—
China	10.3	—	—
Pakistan	9.7	—	—
Japan	5.7	—	—
South Africa	—	—	4.0
Total share represented	73.3	94.2	88.1

— Not applicable.

Source: U.S. Department of Agriculture, *World Grain Situation/Outlook*, various issues.

equally the burden of holding stocks, and market shares may remain nearly constant. With certain types of oligopoly, however, the stock-holding burden will fall disproportionately on some exporters, with the possibility of unintended stock build-ups and changing market shares.

Among the main exporters, the United States has carried a growing proportion of world grain stocks in recent years. Its wheat stocks rose to an average of 38.1 percent of the world total in 1981–84, compared with a 1970–80 average of 28.1 percent. For the same periods, U.S. coarse grain stocks averaged 58 percent of the total, compared with 43.3 percent, and its rice stocks increased to 8 percent, compared with 3.6 percent. By contrast, Canada, the second largest wheat exporter, held an average of 4.7 percent of world wheat stocks in 1981–84, compared with 15.4 percent in 1970–80. Argentina, the second largest coarse grain exporter, held less than 1 percent of world stocks during the entire period. Thailand, the largest rice exporter, has decreased its share of world stocks from 7.8 percent in 1970–80 to 6.4 percent in 1981–84 (USDA 1984).

Was this build-up of stocks by the United States a deliberate policy? This article will suggest that market structure and market behavior have been an overlooked cause of the fall in U.S. exports since 1981 and the rise in U.S. stocks. It develops the familiar argument that the rise of the dollar caused the decline in U.S. exports. Chatlin and Lee (1983), for example, attribute at least half of the decline of U.S. exports in 1982 and 1983 to the strength of the dollar. Schuh (1984) goes further, crediting the export boom of the 1970s to changes in the value of the dollar. Other analysts—including Chambers and Just (1982), Tweeten (1983), and Hathaway (1983)—also suggest a strong causal relationship between the dollar and U.S. agricultural exports. This article argues that it was not the exchange rate alone that led to the fall in U.S. exports and the rise in stocks. The structure of the grains markets and the market behavior of the United States allowed other exporters to displace U.S. exports.

Most research has focused on the determination of market structure, rather than the quantification of market behavior. However, with an oligopoly, pricing and exporting behavior can vary greatly. This article concentrates on market behavior and estimates short-run export functions for the major grain exporters.

An oligopoly exists when there is more than one seller, but few enough that any seller can influence the market. Because of the small numbers, each seller is expected to be aware of the actions of its rivals and of their reactions to changes in its own actions. In such a market many different outcomes are possible, ranging from competition to collusion.

Oligopoly and Price Leadership

If the firms in an oligopolistic industry collude, a cartel could form. Consider the case in which all firms belong to a simple cartel. The curves of market demand and cartel supply are shown in figure 1 as D and S , respectively, and marginal revenue by MR . The cartel will maximize its members' profit by equating supply (or marginal cost) and marginal revenue, selling Q_c at price P_c . By contrast, a perfectly competitive market would produce quantity Q^* at price P^* . The cartel would have to allocate Q_c among its members. It might do so through nonprice competition, each firm being allowed to sell as much as it can at the set price; firms would then differentiate themselves in their services—as happened, for example, in the U.S. airline industry before deregulation. An alternative method of market sharing would be through awarding quotas to each member of the cartel.

Figure 1

Another outcome of oligopoly is price leadership by one or a few suppliers. Suppose the market consists of one dominant firm and several smaller firms. The dominant firm may decide to set the market price and let the small firms sell all they can at that price. The small firms will behave as perfectly competitive suppliers, regarding their demand curve as perfectly elastic at the price set by the market leader. For the dominant firm, the problem is to fix a price that maximizes profits while allowing the small firms to sell as much as they wish.

This is illustrated in figure 2, where market demand is D , and the supply curve of the dominant firm is S_d . The total of the marginal cost curves of all the small firms is S_f .

Figure 2

If the small firms are allowed to produce along their supply curve, S_f , then the demand curve facing the dominant firm is D' and the corresponding marginal revenue curve is $MR_{D'}$. The dominant firm will maximize profits by equating its marginal cost with its marginal revenue, after allowing the small firms to sell what they want. This means equating S_d and $MR_{D'}$, selling a total output of Q_1 at a price of P_1 . The small firms will supply Q_2 . Total sales will be $Q_1 + Q_2 = Q_3$. For a more detailed discussion, see Schmitz and others (1981).

This price leadership model, which emphasizes price leadership and the granting of market access by the dominant firm to smaller ones, is a fair characterization of the world grain markets. The United States is the largest exporter. It sets a price range according to its government programs, allowing price to fall as low as the loan rate,¹ after which grain is bought for storage. If the price rises above a certain

level, stocks are released back onto the market. Other exporting countries seem to have great latitude over how much they sell. This model is consistent with the term “residual supplier” that is often used about the United States (see Bredahl and Green 1983). The testing of this hypothesized behavior is described in the next section.

The small firm in the price leadership model is a price taker. It accepts the world price set by the dominant firm and maximizes its profits by producing up to the point where supply equals world price. In figure 3, domestic supply is shown by S_s and is assumed to be perfectly inelastic within a given marketing year; domestic demand is D_s . So long as the export price is above the level where domestic demand equals domestic supply, the country will wish to export. The excess supply curve, ES_s , is equal to $S_s - D_s$. At the world price, P_w (and assuming the domestic price is equal to the world price), domestic demand is Q_1 and exports are Q_3 (which is also $Q_2 - Q_1$).

The market leader's behavior differs from that of the small supplier because the former faces a downward-sloping demand curve. Its profit-maximizing behavior will be to equate excess supply with marginal revenue of the world demand that remains after exports from the small suppliers. This is shown in figure 4. The dominant country will export Q_1 , which equates its marginal revenue, $MR_{D'}$, with its excess supply curve, ES_d , at a price P_1 .

However, if a price floor is introduced—as in the case of the U.S. loan rate—the market will not be allowed to clear at P_1 . The world price will be the price floor, P_F , prompting exports of Q_2 , which are less than Q_1 . The surplus, $Q_1 - Q_2$, will remain as increased stocks of the dominant exporter. This result is consistent with the argument that the United States behaves as the market leader and explains the recent accumulation of stocks by the United States. It also explains why a similar build-up has not occurred in other exporting countries.

Figure 3

Figure 4

With a price leadership model, two different types of behavior by grain exporters can be expected. The small exporters should behave as perfectly competitive suppliers, responding only to the level of export prices and to domestic demand and supply. Neither the absolute level of world demand nor the exports of other countries should be important in determining their exports. By contrast, the dominant exporter will be strongly influenced by changes in world demand

The Export Supply Model

because it faces the demand that is left over after exports from the small countries.

The excess supply curve for a small country can be formulated as:

$$ES_s = S_s - D_s$$

where ES_s is the excess supply curve; S_s is the domestic supply (production plus opening stocks); and D_s is the domestic demand (including stock demand). A simply functional relationship, with a predetermined supply in a given year, can be specified as:

$$S_s = \bar{S}$$

and domestic demand equal to:

$$D_s = \beta_0 + \beta_1 Z + \beta_2 P$$

where Z denotes a set of variables such as population and income, and P is the export price. Restating:

$$ES_s = \bar{S} - \beta_0 - \beta_1 Z - \beta_2 P$$

The excess supply of the small countries depends on only domestic variables and the export price P .

For the dominant country, the excess supply function is identical to that of a small country when the world market price is the competitive solution. However, when the price is set above this level, as happens when the U.S. loan rate becomes a price floor, then the dominant firm's excess supply schedule becomes:

$$ES_d = \bar{S} - \beta_0 - \beta_1 Z - \beta_2 P \quad \text{if } P \geq P_f$$

$$ES_d = P_f \quad \text{if } P < P_f$$

where P is the oligopoly world market price and P_f is the price floor.

The exports of the market leader will depend on the quantity demanded by the world market after exports from the small suppliers. Since world demand does not affect the small countries, the distinction provides a basis for testing the market behavior of exporters. A two-stage decision process will be assumed for exports. First, the level of domestic demand is determined; in the second stage, the levels of exports and closing stocks are determined. This is a realistic description, because many countries isolate their domestic markets from the

world market.² The small-country supply of exports becomes:

$$(1) X_s = f[(S_s - D_s), P]$$

The dominant-country supply is obtained by extending equation (1) as follows:

$$(2) X_d = f[(S_d - D_d), P, TD]$$

where TD is the sum of world exports.

The statistical results from equations (1) and (2) will reveal a country's export behavior. If the behavior is explained satisfactorily by equation (1), without the need to include information on world demand as in (2), then the country has indeed acted as a small-country exporter. However, if equation (2) provides a significantly better explanation of exports, then the country has behaved as a market leader.

Equation (1) can be extended to include a lagged dependent variable to test for the effects of long-term contracts, which are a common feature of trade in grains. This extension yields the following:

$$(3) X_d = f[(S_s - D_p), P, TD, X_{d-1}]$$

The three equations were estimated for rice, wheat, and coarse grains for the five largest exporting countries in each market.³

Rice

For rice, the results in table 2 support the price leadership model; the level of world imports is statistically significant only in the export equation for the United States. For other exporters, the level of world demand is not statistically significant in explaining their exports.

The export price of rice is not a significant explanatory variable in most of the export equations. Equation (3) had a positive and significant coefficient for Japan at the 10 percent level; equation (1) had a positive and significant coefficient at the 1 percent level for China. However, equations (2) and (3) did not show a significant result for China. The export elasticity for Japan for equation (3) was 1.39, and the world export elasticity based on Japan's 1979-81 market share was 0.08. The export availability variable is significant at the 10 percent level or higher in every equation except for China and always has the expected sign. The estimated coefficient is between zero and one, as expected, for all exporters except Pakistan. The coefficient for Pakistan is probably biased upward as it reflects a trend to smaller rice stocks and larger wheat stocks, as local consumption shifted

Table 2. *Applications of the Model to Net Exports of Rice*

Country and equation	Intercept	Export availability ^a	Export price ^b	Lagged net exports	Total world imports	R ²	DW or H statistic ^c	Estimation period and procedure ^d
<i>United States</i>								
Equation (1)	390.04	0.55	38.33	—	—	0.78	2.01	1965–81
	1.17	6.78***	0.80	—	—		DW	OLS
		0.73	0.07	—	—			
Equation (2)	96.44	0.32	35.70	0.48	—	0.80	2.07	1965–81
	0.34	2.09*	0.88	1.82*	—		DW	COR
		0.42	0.07	0.46	—			
Equation (3)	291.14	0.31	-14.78	0.06	0.14	0.86	1.97	1965–81
	0.98	1.93*	-0.31	0.23	2.35**		DW	COR
		0.41	-0.03	0.06	0.42			
<i>Thailand</i>								
Equation (1)	-224.63	0.74	—	—	—	0.85	1.30	1965–81
	-0.45	7.68***	—	—	—		DW	OLS
		1.25	—	—	—			
Equation (2)	-641.30	0.66	-1.27	0.30	—	0.91	-0.26	1965–81
	-1.46	7.81***	-0.45	2.71**	—		H	OLS
		1.12	0.06	0.29	—			
Equation (3)	-641.02	0.66	-1.28	0.30	0.0007	0.91	-0.28	1965–81
	-1.40	5.40***	-0.36	2.15*	0.008		H	OLS
		1.12	-0.06	0.29	0.002			
<i>Japan</i>								
Equation (1)	-367.11	0.14	-0.0237	—	—	0.67	1.82	1965–81
	-0.96	2.95**	-0.12	—	—		DW	OLS
		2.94	-0.17	—	—			
Equation (2)	-399.75	0.10	0.09	0.62	—	0.90	-0.11	1965–81
	2.65**	6.09***	1.23	10.55***	—		H	COR
		2.08	0.64	0.38	—			

Equation (3)	-899.89 -2.66	0.11 6.65*** 2.30	0.20 2.08* 1.39	0.53 6.84*** 0.33	0.05 1.62 1.67	0.92 -0.64 H	1965-81 COR
<i>China^c</i>							
Equation (1)	768.63 0.97	-0.01 -0.94 -0.53	306.48 3.51*** 0.93	— — —	— — —	0.48 — — DW	1965-81 OLS
Equation (2)	912.38 1.25	-0.01 -1.24 -0.65	121.88 0.96 0.37	0.56 1.87* 0.57	— — —	0.59 — — DW	1965-81 OLS
Equation (3)	774.27 0.90	-0.005 -0.24 -0.28	133.71 0.98 0.41	0.53 1.63 0.54	-0.06 -0.34 -0.27	0.59 — — DW	1965-81 OLS
<i>Pakistan</i>							
Equation (1)	-540.12 -6.65***	1.12 15.02*** 1.92	1.54 0.72 0.05	— — —	— — —	0.94 — — DW	1965-81 OLS
Equation (2)	-535.66 -4.74***	1.11 7.10*** 1.91	1.48 0.61 0.05	0.01 0.06 0.01	— — —	0.94 — — H	1965-81 OLS
Equation (3)	-535.41 -3.37***	1.11 5.73*** 1.91	1.48 0.58 0.05	0.01 0.06 0.01	-0.0001 -0.002 -0.001	0.94 — — H	1965-81 OLS

— Not applicable.

Note: For each variable, the estimated coefficient is listed first; the *t* statistic and elasticity are below the coefficient, respectively. Statistical significance is denoted as (***) for 0.01, (**) for 0.05, and (*) for 0.10 levels of significance, respectively.

a. Production + beginning stocks - domestic consumption.

b. U.S. export price × exchange rate ÷ consumer price index of exporting country.

c. The Durbin-Watson statistic is denoted DW, and the H test for serial correlation when a lagged dependent variable is present is denoted H.

d. The estimation procedure for each equation is indicated by OLS for ordinary least squares and by COR for corrected for first-order serial correlation.

e. The deflated U.S. export price was used for China because no data were available for the Chinese consumer price index.

strongly away from rice and toward wheat. The result for China suggests that the decision to export is not based on the availability of rice, but on other factors. The lagged rice net export variable was statistically significant at the 10 percent level or higher in four of the five countries estimated under equation (2), but in only one country under (3). This variable should be positive and significant if a country has a partial adjustment scheme or if long-term contracts are important in explaining rice exports. The results are mixed; only Japan shows strong evidence of partial adjustment or the use of long-term contracts.

Wheat

The equations for wheat are shown in table 3 for the five major exporters. Equation (3) seems to provide results consistently superior to the other equations, based on the fit shown by the R^2 . The estimated coefficient on the level of world imports was statistically significant at the 1 percent level for the United States and Canada and at the 5 percent level for Australia. It was not significant for Argentina and the European Community (EC). The coefficients are nearly equal to the historical market shares of the exporters, suggesting relatively stable shares for the United States, Australia, and Canada. The coefficient for the United States was 0.43, close to its historical market share over the period. The coefficient for Canada, 0.15, was also nearly the same as its historical share. However, the coefficient for Australia was 0.05, compared with its historical market share of approximately 12 percent: Australia may therefore have been a small exporter over part of the period, becoming a dominant member of the oligopoly only in recent years. (Fitting the same equation over 1970–81 supports this view; the estimated coefficient is 0.14.) As for the EC, it has been a net wheat exporter only since 1974, so the export equation was estimated over 1974–81. This gave a coefficient of 0.06, but the results were not statistically significant.

For all three equations, the amount of wheat available for export was statistically significant at the 1 percent level in explaining the exports of the EC, Australia, and Argentina. The results show that their exports were influenced by availability. The estimated coefficients for the EC, Australia, and Argentina for equation (3) were 0.65, 0.49, and 0.87, respectively. By contrast, the equivalent coefficients for the United States and Canada were not significantly different from zero at the 10 percent level. Neither country would have increased its wheat exports even if supplies had been available.

Only the United States had a significant positive price response to world prices. The export elasticity for U.S. exports was 0.31 computed at the means, and the world export elasticity based on the U.S.

market share in 1979–81 was 0.14. The other exporters all had an insignificant or perverse response to world prices. However, a price response cannot be ruled out, because their domestic demand could respond to the world price and thus alter the amount of wheat they had for export. This effect would not be reflected in the equations because of the two-stage procedure used. However, national policies that insulate the domestic market from the world market make the supply of exports more inelastic than it otherwise would be.

The partial-adjustment hypothesis found little backing from the wheat market. Under equation (3), none of the exporting countries had a positive and statistically significant response to lagged exports. Under (2), the EC and Australia have a response significant at the 10 percent and 5 percent levels, respectively.

In summary, the price leadership model receives weak support from the estimated equations for wheat. Only Argentina and the EC show signs of behaving as small exporters. The others—the United States, Canada, and Australia—appear to have an implicit market-sharing arrangement, a result consistent with the findings of Alaouze, Watson, and Sturgess (1978). However, the United States and Canada depend more than Australia on the level of world demand for their exports. The EC, Australia, and Argentina have been able to export a significant part of their production irrespective of world demand. Given Canada's inability to ignore world demand, it seems odd that its exports were nonetheless unresponsive to prices. The insignificant coefficient on available supplies suggests that extra supplies were not constraining exports, but yet higher prices did not increase exports. Perhaps exogenous factors, such as shipping capacity or weather-related shipping delays, have been an important determinant of Canadian exports. This possibility is supported by Spriggs and McKinzie (1980).

Coarse Grains

As table 4 shows, U.S. exports were heavily influenced by the level of world demand. Canada's exports were influenced only slightly, and the other countries' not at all. The estimated coefficient on world imports for the United States is 0.69, indicating a stable market share and a close link between world imports and U.S. exports. The U.S. coefficient was statistically significant at the 1 percent level, that for Canada only at the 10 percent level.

The most significant explanatory variable for coarse grain exports was export availability. It is significant at the 1 percent level in every case, except for equation (3) for the United States. For the rest, the estimated coefficients range between 0.5 and 1.0. Argentina has a coefficient only slightly below 1.0, indicating that it exports nearly all

Table 3. *Applications of the Model to Net Exports of Wheat*

<i>Country and equation</i>	<i>Intercept</i>	<i>Export availability^a</i>	<i>Export price^b</i>	<i>Lagged net exports</i>	<i>Total world imports</i>	<i>R²</i>	<i>DW or H statistic^c</i>	<i>Estimation period and procedure^d</i>
<i>United States</i>								
Equation (1)	-19,108.3	0.66	11,904.5	—	—	0.90	1.52	1965-81
	-4.46***	10.65***	5.40***	—	—		DW	OLS
		1.19	0.50	—	—			
Equation (2)	-20,518.9	0.73	13,004.9	-0.13	—	0.91	0.17	1965-81
	-3.41***	5.91***	3.74***	-0.63	—		H	COR
		1.32	0.54	-0.12	—			
Equation (3)	-7,562.7	0.15	7,454.7	-0.10	0.43	0.97	-1.00	1965-81
	-2.19**	1.29	3.78***	-0.88	5.66***		H	COR
		0.26	0.31	-0.10	0.79			
<i>Canada</i>								
Equation (1)	19,682.0	-0.08	-2,862.3	—	—	0.44	1.53	1965-81
	2.31**	-0.34	-1.18	—	—		DW	COR
		-0.16	-0.27	—	—			
Equation (2)	18,605.0	-0.14	-3,779.7	0.28	—	0.47	1.68	1965-81
	1.99*	-0.58	-1.38	1.03	—		DW	COR
		-0.29	0.35	0.27	—			
Equation (3)	7,566.3	0.03	-2,485.7	0.03	0.15	0.76	0.84	1965-81
	1.05	0.15	-1.26	0.17	3.78***		H	COR
		0.05	-0.23	0.03	0.58			
<i>EC</i>								
Equation (1)	-2,457.8	0.80	-14.83	—	—	0.98	2.90	1974-81
	-1.73	14.40***	-3.03***	—	—		DW	OLS
		2.19	-0.07	—	—			
Equation (2)	-3,067.4	0.71	-9.33	0.19	—	0.99	1.98	1974-81
	2.94***	12.64***	-2.24*	2.42*	—		H	OLS
		1.93	-0.42	0.14	—			

Equation (3)	-6,209.9 -2.71*	0.65 10.51*** 1.77	-5.95 -1.39 -0.26	0.06 0.47 0.04	0.06 1.50 0.77	0.99	-1.26 H	1974-81 OLS
<i>Australia</i>								
Equation (1)	3,166.7 1.73	0.52 6.21*** 0.70	-567.3 -0.39 -0.07	— — —	— — —	0.81	1.54 DW	1965-81 COR
Equation (2)	-2,639.9 -0.98	0.53 6.17*** 0.71	1,702.7 1.06 0.20	0.41 2.83** 0.40	— — —	0.81	1.11 H	1965-81 OLS
Equation (3)	-823.6 -0.33	0.49 6.26*** 0.65	372.0 0.24 0.04	0.11 0.61 0.11	0.05 2.20** 0.29	0.86	0.53 H	1965-81 OLS
<i>Argentina</i>								
Equation (1)	-73.85 -0.17	0.91 14.60*** 1.13	-8.92 -0.95 -0.10	— — —	— — —	0.95	1.49 DW	1965-81 COR
Equation (2)	-202.76 -0.44	0.89 13.63*** 1.10	-8.90 -1.03 -0.10	0.06 0.97 0.06	— — —	0.95	1.09 H	1965-81 OLS
Equation (3)	-398.66 -0.76	0.87 12.50*** 1.08	-7.64 -0.86 -0.07	0.05 0.77 0.05	0.05 0.80 0.09	0.95	1.07 H	1965-81 OLS

— Not applicable.

Note: For each variable, the estimated coefficient is listed first; the *t* statistic and elasticity are below the coefficient, respectively. Statistical significance is denoted as (***) for 0.01, (**) for 0.05, and (*) for 0.10 levels of significance, respectively.

a. Production + beginning stocks - domestic consumption.

b. U.S. export price × exchange rate ÷ consumer price index of exporting country.

c. The Durbin-Watson statistic is denoted DW, and the H test for serial correlation when a lagged dependent variable is present is denoted H.

d. The estimation procedure for each equation is indicated by OLS for ordinary least squares and by COR for corrected for first-order serial correlation.

Table 4. *Applications of the Model to Net Exports of Coarse Grains*

Country and equation	Intercept	Export availability ^a	Export price ^b	Lagged net exports	Total world imports	R ²	DW or H statistic ^c	Estimation period and procedure ^d
<i>United States</i>								
Equation (1)	-61,365.7	0.79	41,047.8	—	—	0.91	1.72	1965-81
	-5.87	11.55***	5.51***	—	—		DW	OLS
		1.55	1.00	—	—			
Equation (2)	-39,562.3	0.48	27,528.0	0.40	—	0.93	0.45	1965-81
	-2.90**	3.20***	3.04***	2.18*	—		H	OLS
		0.96	0.67	0.38	—			
Equation (3)	-22,521.7	0.20	14,883.6	-0.13	0.69	0.97	-1.32	1965-81
	-2.31**	1.64	2.25**	-0.78	4.30***		H	OLS
		0.39	0.36	-0.13	0.95			
<i>Canada</i>								
Equation (1)	-3,319.4	0.75	-152.55	—	—	0.71	1.34	1965-81
	-1.67	5.66***	-0.11	—	—		DW	OLS
		2.28	-0.06	—	—			
Equation (2)	-2,310.3	0.60	-631.06	0.29	—	0.75	1.94	1965-81
	-1.13	3.68***	-0.46	1.43	—		H	OLS
		1.83	-0.24	0.25	—			
Equation (3)	-2,230.6	0.54	-1,175.17	0.05	0.03	0.82	2.07	1965-81
	-1.23	3.66***	-0.96	0.25	2.16*		H	OLS
		1.64	-0.44	0.05	0.57			
<i>Australia</i>								
Equation (1)	-82.25	0.77	-26.70	—	—	0.94	1.55	1965-81
	-0.13	11.31***	-0.04	—	—		DW	COR
		1.06	-0.01	—	—			
Equation (2)	-693.29	0.77	345.97	0.14	—	0.95	-0.23	1965-81
	-1.07	12.01***	0.57	1.72	—		H	COR
		1.07	0.13	0.13	—			

Equation (3)	-1,287.15 -2.05*	0.72 10.17*** 0.99	855.33 1.45 0.33	0.11 1.14 0.10	0.01 1.27 0.17	0.96 -0.04 H	1965-81 COR
<i>Argentina</i>							
Equation (1)	286.22 1.08	0.97 51.03*** 1.03	-19.45 -2.98* -0.07	— — —	— — —	0.995 2.60 DW	1965-81 OLS
Equation (2)	602.49 2.81**	0.99 59.28*** 1.05	-24.56 -5.56*** -0.08	-0.04 -2.26** -0.04	— — —	0.997 -0.84 H	1965-81 COR
Equation (3)	604.64 2.70**	0.99 46.93*** 1.05	-24.43 -5.20*** -0.08	-0.05 -1.96* -0.04	0.0004 0.14 0.002	0.997 -0.85 H	1965-81 COR
<i>South Africa</i>							
Equation (1)	354.95 0.58	0.58 12.02*** 0.97	-615.05 -0.56 -0.11	— — —	— — —	0.92 2.62 DW	1965-81 OLS
Equation (2)	-300.41 -0.77	0.57 15.43*** 0.96	351.45 0.53 0.06	0.09 1.52 0.08	— — —	0.95 -1.03 H	1965-81 COR
Equation (3)	-378.17 -0.91	0.59 11.60*** 1.00	499.15 0.70 0.09	0.12 1.53 0.11	-0.0026 -0.57 -0.05	0.95 -1.01 H	1965-81 COR

— Not applicable.

Note: For each variable, the estimated coefficient is listed first; the *t* statistic and elasticity are below the coefficient, respectively. Statistical significance is denoted as (***) for 0.01, (**) for 0.05, and (*) for 0.10 levels of significance, respectively.

a. Production + beginning stocks - domestic consumption.

b. U.S. export price × exchange rate ÷ consumer price index of exporting country.

c. The Durbin-Watson statistic is denoted DW, and the H test for serial correlation when a lagged dependent variable is present is denoted H.

d. The estimation procedure for each equation is indicated by OLS for ordinary least squares and by COR for corrected for first-order serial correlation.

its output beyond domestic requirements, irrespective of world market conditions. South Africa and Australia exported a smaller proportion of available supplies but were also unaffected by world market conditions. As for export prices, the estimated coefficient for the United States was significant at the 5 percent level for equation (3) and significant at the 1 percent level for (1) and (2). The export elasticity for equation (3) was 0.36 computed at the means, and the world export elasticity was 0.24 based on the 1979–81 market share. The other exporters had an insignificant or perverse response to export price.

There is no firm evidence of a partial adjustment scheme in coarse grain exports. The lagged exports variable is significant and of the correct sign at the 10 percent level only for equation (2) for the United States.

Taking all these factors together, the evidence to support market leader behavior in coarse grains is quite strong. Only the United States was strongly dependent upon world demand to explain exports, and only it had a significant and positive price response and an insignificant coefficient on export availability. Canada shows some signs of sharing market dominance with the United States but also exhibits the characteristics of a small exporter. The other exporters—Australia, Argentina, and South Africa—demonstrate no responsiveness to market conditions. They behave as perfectly competitive exporters, with supply curves that are almost perfectly inelastic.

Recent Policy Changes in the United States

The U.S. farm bill passed in December 1985 may signal a change in U.S. policy that will remove its dominant role. The bill includes a crop-marketing loan provision, which is designed to force grain onto the market rather than into government storage. It would effectively remove the price floor that has been provided by the U.S. loan rate. However, the marketing loan provision is operational only if the secretary of agriculture chooses to use it. It has been adopted for rice, but not for other grains (USDA 1986). For them, the loan rates were reduced by approximately 25 percent.

The changes in U.S. practice can be viewed in different ways. They may signal only a price change by the United States to bring world demand and supply closer to balance, which could be consistent with the behavior of the dominant firm. Alternatively, it may show that the United States is no longer following the role of the price leader in the oligopoly model. Which of these two descriptions actually applies appears to rest for the moment with the secretary of agriculture. However, an economic explanation for the changes is that they maximize revenue for the United States but were not allowed to occur

gradually because of the rigidities of government policy. Sharp reductions were therefore necessary to adjust to the changed market conditions of the past several years.⁴

This explanation receives considerable support from what happened in the grain markets in 1982–84 (see table 5). Using this information to compute a linear demand curve for world imports for each of the grains, it is possible to compute the residual demand curve faced by the United States. The exercise makes the simplifying assumption of no price response from non-U.S. exporters. The table also shows the import price elasticities faced by the United States during 1982–84: -1.45 for wheat, -1.26 for coarse grains, and -1.15 for rice. The elasticities for wheat and coarse grains were computed at the average world price in 1982–84, which was partially set by U.S. loan rates. Without the loan rate supports, prices would have been lower and so would the elasticities for the United States. The import demand elasticities for rice were computed using the Thai export price, which more accurately reflects the world price in 1982–84 than does the U.S. export price. The U.S. export price was more than twice the Thai price, and U.S. exports were made possible only because of special export programs.

Once loan rates were cut, however, the U.S. import elasticities were reduced: for wheat, from -1.45 to -0.78 ; for coarse grains, from -1.26 to -0.58 (see the last row in table 5). The U.S. loan rate for rice was not operating as the price floor to the world market and thus had little direct effect on the import elasticity.

Several conclusions can be drawn from the results in table 5. Even though the world import demand elasticities are very low, the residual import demand faced by the United States in wheat, rice, and coarse

Table 5. *U.S. and World Export Market Conditions for Rice, Wheat, and Coarse Grains, 1982–84*

<i>Item</i>	<i>Rice</i>	<i>Wheat</i>	<i>Coarse grains</i>
World imports (millions of metric tons)	12.00	102.40	95.00
U.S. exports (millions of metric tons)	2.30	38.90	56.00
Non-U.S. exports (millions of metric tons)	9.70	63.50	39.00
World export price (U.S. dollars a metric ton) ^a	274.00	153.20	127.70
World import elasticity ^b	-0.22	-0.55	-0.74
U.S. residual import elasticity	-1.15	-1.45	-1.26
Revised U.S. residual import elasticity	—	-0.78	-0.58

— Not applicable.

a. U.S. export price for wheat and maize; Thai export price for rice.

b. Estimated for 1961–81 for major importing countries and regions and weighted to obtain the world import elasticity.

Source: For import and export quantities: USDA 1985.

grains was elastic during 1982–84. As the point of unitary elasticity on the demand curve faced by the United States corresponds with revenue maximization, these results show that the United States was not setting prices at a revenue-maximizing level. The reduction in loan rates can be interpreted as an attempt to reach that objective. Since a dominant oligopolist will never maximize profits on the inelastic portion of its demand curve, it appears that, given current market conditions and the depreciation of the dollar, the United States may have cut its loan rates by more than was needed to maximize revenues. Political pressures to raise loan rates and world prices can therefore be expected.

Abstract

This article develops and tests several models of market behavior over the 1965–81 period to identify the market behavior of each of the five largest grain exporters in rice, wheat, and coarse grains. The results show that the United States has exerted price leadership in the rice and coarse grains markets. The remaining major exporters in these markets have behaved in a manner consistent with a small-country exporter model in which their market demand is perceived to be perfectly elastic at the world price set by the dominant exporter. The results for wheat suggest a shared dominance between the United States, Canada, and Australia, with the European Community and Argentina behaving as small-country exporters.

The short-run export supply curves for the five largest exporters appear to be very unresponsive to price. For rice, only Japan's exports were found to have a significant and positive response to an increase in the world export price. For wheat and coarse grains, only the United States' exports were estimated to be positively and significantly related to the export price.

An important implication of the current market behavior of the major exporters is that the opportunity exists for all other exporters to sell all they can at the world price. However, a significant risk exists that the United States will stop supporting the world price through its loan rate mechanism. A provision for such a change, the crop marketing loan provision, was included in the Food Security Act of 1985 for wheat and coarse grains and has already been implemented for rice.

Notes

1. The loan rate is the price at which farmers can borrow from the government against their crop. If crop prices rise, the farmers can redeem their crop and sell it to repay the loan. If prices do not rise, the crop is retained by the government as full payment of the loan. In many years, the U.S. loan rate becomes a price floor, which supports the U.S. market price and—because of the size of U.S. exports—the world price as well.

2. During some period of the 1960s and 1970s, nearly every major grain exporting country had a two-tier pricing scheme to separate domestic consumer prices from international prices. The European Community has followed a two-tier pricing system for grains since 1967, which maintains domestic prices above world market levels. Both Canada and Australia set wheat prices for domestic consumption at levels that may be above or below world prices, depending on international price movements. Japan maintains a differential between rice prices paid by consumers and prices received by producers by means of large subsidies to farmers. Thailand has maintained low consumer prices for rice by requiring exporters to sell a certain quota in the domestic market. South Africa establishes a domestic maize price to consumers below the producer price. Even the United States has followed a two-tier pricing system at certain times. During the early 1960s and again in the late 1960s and early 1970s, the United

States had a wheat export subsidy that allowed exports to be sold at levels below those in the domestic market. For a review of these various policies, see USDA (1981).

3. Estimation was carried out using ordinary least squares. Although a simultaneity bias could exist between the level of exports and the world price, this bias will not be a major problem for the small exporters—and may not be significant even for the dominant exporter if prices are set by policies that are unresponsive to changing market conditions. Based on preliminary estimates, the simultaneity problem was not found to be significant.

4. The reductions in the wheat and corn loan rates for the 1986 crop have been reflected in market prices, as expected. From January to August U.S. farm prices of wheat and corn declined 31 percent and 28 percent, respectively. World prices declined 24 percent and 27 percent, respectively, during the same period. World rice prices, which were not as closely linked to the U.S. loan rate as were other grains, declined 16 percent during the same period, while U.S. farm prices for rice declined 29 percent.

References

- Alaouze, Chris M., A. S. Watson, and N. H. Sturgess. 1978. "Oligopoly Pricing in the World Wheat Market." *American Journal of Agricultural Economics* 60, no. 2 (May): 173–85.
- Bredahl, Maury E., and Leonardo Green. 1983. "Residual Supplies Model of Coarse Grain Trade." *American Journal of Agricultural Economics* 65, no. 4 (November): 785–90.
- Chambers, Robert G., and Richard E. Just. 1982. "An Investigation of the Effect of Monetary Factors on Agriculture." *Journal of Monetary Economics* 9 (March): 235–47.
- Chatlin, Barbara, and John E. Lee, Jr. 1983. "United States Agricultural Policy in a Managed Trade World." In *United States Farm Policy in a World Dimension*. Special Report 305. Columbia: University of Missouri, Agricultural Experiment Station.
- Hathaway, Dale E. 1983. "Agricultural Trade: 1984 and Beyond." In *Outlook '84*. Proceedings of the Agricultural Outlook Conference. Washington, D.C.: U.S. Department of Agriculture.
- McCalla, Alex F. 1966. "A Duopoly Model of World Wheat Pricing." *Journal of Farm Economics* 48, no. 3: 711–27.
- Schmitz, Andrew, and others. 1981. *Grain Export Cartels*. Cambridge, Mass.: Ballinger.
- Schuh, Edward G. 1984. "Future Directions for Food and Agricultural Trade Policy." *American Journal of Agricultural Economics* 66, no. 2 (May): 242–47.
- Spriggs, John, and Lance McKinzie. 1980. "Analysis of the Export Constraints on Canadian Wheat in 1977/78." *Canadian Journal of Agricultural Economics* 28, no. 3: 6–19.
- Tweeten, Luther. 1983. "Economic and Policy Outlook for U.S. Agriculture." In *United States Farm Policy in a World Dimension*. Special Report 305. Columbia: University of Missouri, Agricultural Experiment Station.
- U.S. Department of Agriculture (USDA). 1981. *Trade Restrictions in International Grain and Oilseed Markets*. FAER-162. Washington, D.C.: USDA, Economics and Statistics Service.
- _____. 1985. *World Grain Situation/Outlook*. FG-9-85 (June).
- _____. 1986. *The Food Security Act of 1985, Major Provisions Affecting Commodities*. Bulletin 497. Washington, D.C.: USDA, Economic Research Service.

MACROECONOMIC ADJUSTMENT IN DEVELOPING COUNTRIES: A POLICY PERSPECTIVE

Mohsin S. Khan

The need for macroeconomic adjustment arises when a country has an imbalance between domestic demand and supply, reflected in a growing external deficit, inflationary pressures, and slowing growth. The imbalances can be caused by external factors (such as worsening terms of trade and a rise in foreign interest rates), as well as domestic policies that expand demand too rapidly and reduce the growth of productive capacity. In principle, a country can avoid adjustment by borrowing abroad or imposing controls on trade and payments. However, this type of strategy carries some well-known costs. These include overvaluation of the exchange rate, loss of international competitiveness, reduced economic growth, increased foreign debt, and inefficient allocation of resources because of distortions in relative prices.

Sooner or later, these pressures will ensure that the imbalance has to be corrected. If the correction comes because a country loses its creditworthiness, recent experience has shown that forced adjustment is likely to be very disruptive. The essence of a macroeconomic adjustment program is to ensure that the supply-demand imbalance is eliminated in an orderly way, before the economy becomes seriously distorted and external finance is exhausted. The program therefore has to include a variety of policies that reduce demand and increase the availability of resources. Following Khan and Knight (1982, 1985), these policies can be grouped according to where their primary impact will be: on absorption—*demand management policies*; on current and potential output—*structural policies*; on the composition of absorp-

tion and production between tradable and nontradable goods—*exchange rate policies*; and on capital flows—*external financing policies*. The purpose of this article is to describe how these policies can be expected to affect the targets to which they are directed and thereby achieve the goal of macroeconomic adjustment, characterized by a sustainable current account position, a reduced rate of inflation, a stable and high rate of economic growth, and a manageable level of foreign debt.

Demand Management Policies

Macroeconomic adjustment is often viewed as synonymous with policies to restrain demand, so they have received considerable attention in the literature.¹ The two main instruments for controlling demand are monetary policy and fiscal policy. (The demand-side effects of exchange rate policies will be treated separately later.)

Monetary Policy

In the traditional closed economy model, interest rates are the transmission mechanism between monetary policy and aggregate demand. When the money supply expands, individuals buy real and financial assets in an attempt to restore portfolio balance. This lowers market interest rates and stimulates those components of aggregate demand that are sensitive to interest rates. In a small open economy, in contrast, the transmission mechanism is described in versions of the monetary approach to the balance of payments (see Frenkel and Johnson 1976 and IMF 1977). This approach holds that, with fixed exchange rates, an expansion of domestic credit induces the public to dispose of surplus cash by buying foreign goods and securities, leaving domestic output and prices unaffected. With flexible exchange rates, a similar expansion in domestic credit results in an increase in the money supply, a proportional depreciation of the exchange rate, and a corresponding rise in the domestic price level.

Neither of these models is directly applicable to most developing countries, where financial markets are underdeveloped, foreign exchange controls are in force, interest rates are set below market-clearing levels by the government, and a relatively free curb market operates.² In these conditions, how does monetary policy work?

If exchange controls are effective, the authorities can determine the monetary base through their control over the availability of foreign exchange and over credit from the central bank. Starting from portfolio equilibrium, a fall in the supply of bank credit to the private sector will cause borrowers to turn to the curb market, pushing up interest rates there. Since those rates represent the marginal cost of finance in the economy, the interest-sensitive components of aggregate demand will

decline. In particular, the implicit value of real assets will fall relative to their production costs, and demand for such assets will be reduced.³ The decline in aggregate demand would then put downward pressure on inflation.⁴ Similarly, a decrease in the money supply leaves the private sector with too little money in its portfolio relative to loans and real assets. As a result, the supply of curb market loans falls, leading to a rise in curb market interest rates. Again, demand for real assets is reduced, and downward pressure is put on prices.

If exchange controls are ineffective, however, monetary policy has less power to affect aggregate demand. Some of the effects of a reduction in the money supply would be offset by changes in foreign exchange claims or liabilities, weakening the impact on the curb market interest rate and on the demand for real assets. And where there are no exchange controls, of course, the standard monetary approach to the balance of payments becomes the relevant form of analysis.

Even when credit and foreign exchange are rationed, it is possible to argue that changes in the growth of money would be neutral in the long run. During the adjustment process, however, a restrictive monetary policy would be associated with a fall in capacity utilization and a rise in unemployment, since prices tend to be sticky downward.⁵ The size and duration of the deflationary effect would naturally depend on how demand and supply respond to a tighter monetary policy. The relevant factors would include (a) the speed with which the initial monetary disequilibrium is offset by movements in international reserves (which in turn depend on the presence and effectiveness of exchange controls); (b) the stickiness of domestic prices, which will be determined by wage-setting behavior and the degree of slack in the economy; (c) the effect on investment of changes in the cost or availability of credit; and (d) the extent to which policies were anticipated when wage contracts were negotiated.⁶ Both the theoretical and empirical validity of these factors need to be explored to establish the effects of monetary policy on demand.

Fiscal Policy

The direct effects of changes in public expenditures are fairly well accepted. Public spending on goods and services is itself a component of domestic expenditure, and as such it contributes directly to absorption. If government purchases are limited to nontradable goods, they add to the aggregate demand for domestic goods. Public purchases of traded goods, however, have no effect on real aggregate demand or on output and inflation; they only worsen the trade balance.

It is the indirect effects of public sector purchases that have generated controversy. At issue is the extent to which an increase in public spending reduces or increases private spending, thus resulting in a rise

in total spending different from the original increase in government expenditure. There are several mechanisms through which private spending could fall when public spending rises. For example, increased public spending could boost domestic economic activity and thereby the private sector's demand for money. If interest rates rise to maintain portfolio equilibrium, they would, other things being equal, tend to reduce the interest-sensitive components of demand—the familiar “financial crowding-out” proposition. Even if interest rates do not rise immediately and portfolio imbalances persist, the excess demand for money may cause households to spend less in order to accumulate cash (see Khan and Knight 1981).

Private spending can also be reduced if extra public expenditure increases the private sector's tax liability, either in the present because of higher taxes now or in the future because of the need to retire public debt. This is the well-known “Ricardian equivalence” proposition developed by Barro (1974).⁷ Finally, if nominal wages are flexible, or if the extra public spending was foreseen when wages were negotiated, domestic prices could rise enough to reduce private spending by the same amount that public spending rose, thereby leaving aggregate demand unchanged.⁸ Rational expectations models of public and private spending have yet to be tested for developing countries, and the debate has remained largely theoretical.⁹

Tax receipts from the private sector have no direct effect on absorption. They do, however, affect private disposable income and may thereby indirectly affect private spending. The effect is likely to depend on whether the tax is viewed as permanent or temporary (temporary taxes are expected to reduce saving); the characteristics of the recipients, including demographic factors such as age and household size (since these affect the marginal propensity to consume out of current income); and the nature of the financial system (which will affect the extent to which taxpayers' liquidity is constrained). As transfers are essentially the obverse of taxes, their effects on domestic absorption will be the opposite of the tax effects described above. A transfer should increase private absorption—though not necessarily total absorption—since that effect will depend on how the government finances its transfers.

In summary, the effects of fiscal policy on aggregate demand appear more complex than Keynesian theory suggests, and it is debatable whether a restrictive fiscal policy would reduce domestic demand. Ultimately, the issue requires more empirical testing.

Structural Policies

Structural policies differ from demand management in two respects. First, they place more emphasis on growth rather than on the control of domestic demand and an immediate improvement in the current

account. In developing countries the goal of achieving a more efficient allocation of resources and faster growth may sometimes conflict in the short run with that of reducing the current account deficit. Since these countries import most or all of their capital goods, structural programs often have different current account objectives in the early years of adjustment than do programs aimed primarily at curbing demand. In particular, to the extent that supply-side improvements require an initial rise in investment, reductions in current account deficits would not necessarily be sought in the early years of a program. Second, structural policies may take a long time to show results. They usually require a significant rise in investment in the more efficient sectors, combined with the release of capital and labor elsewhere. Such major adjustments take longer to achieve than a program to reduce demand, and thus structural programs have to have a longer time horizon.

Structural policies can take many forms depending on the nature of the economy and the types of problems it faces. Such policies can, however, be put into two broad groups: (a) policies to improve efficiency and resource allocation and (b) policies to expand productive capacity of the economy.

Efficiency

This category includes all measures to reduce the distortions that drive a wedge between prices and marginal costs. Such distortions can arise, for example, from price controls, imperfect competition, taxes, subsidies, and trade restrictions. The attractiveness of policies that improve efficiency is their potential for increasing output from a given stock of resources without reducing consumption. Nevertheless, attempts to eliminate major distortions present practical difficulties. First, if capital and labor do not move easily from sector to sector, changes in relative prices and incentives may produce unemployment for a long period before adjustment can be completed. Second, many government policies that create distortions may have been intended to achieve objectives other than economic efficiency—such as job creation, consumer subsidies, price controls on basic commodities, and restrictions on certain types of imports. Changes based purely on efficiency need to take account of political realities. Finally, microeconomic policy measures suffer from certain theoretical weaknesses: a well-known one suggested by the theory of the second best is that, if an economy has many significant distortions, eliminating only some of them will not necessarily produce an increase in efficiency in the economy overall.

By their nature, distortions tend to be microeconomic and country specific. Nevertheless, two sources of inefficiency with macroeconomic

significance have recently become more important. One is the inefficiency caused by artificial barriers to foreign trade. Tariffs, quotas, and other restrictions on trade and payments reduce the amount of trade and specialization and tend to foster import-substituting industries that lack efficiency and flexibility of firms continuously exposed to international competition. Several studies—for example, Balassa (1982) and Krueger and others (1981)—have shown that, at the broadest level, countries with outward-looking strategies have fared better in terms of growth, employment, and adjustment to external shocks than those with an inward-looking approach. The outward-oriented strategies have been characterized by incentives for domestic producers to export their goods or to compete with imports. The relative success of these policies has prompted considerable efforts to encourage developing countries to liberalize their trade (see Edwards 1984 and Krueger 1985).

A second source of inefficiency in some developing countries is the distortion associated with price controls. For example, governments often fix the prices of agricultural commodities at levels different from those in world markets. Such policies have a powerful effect on the level and allocation of agricultural production and on consumption. In many developing countries state marketing boards buy most of the farmers' output. If a marketing board tries to increase its revenues (or reduce its losses) by holding the prices it pays below world levels, it is effectively taxing output. This creates disincentives to both domestic production and exports and can increase imports and cause budgetary problems for the government. Empirical evidence suggests that increasing producer prices tends to stimulate output, particularly in the longer term (see Bond 1983). The same applies to energy prices. If they are held below world market prices, the government has to absorb the cost of subsidies in its budget, and the country will be slow to shift to less energy-intensive production and consumption.

Capacity

The rate at which an economy's capacity can be expanded depends, among other things, on the split between consumption and investment, as well as on the nature and quality of the capital stock being added (see Krueger 1986 and Sen 1983). For this objective the appropriate structural policies are those that favor investment and savings. Because investment in developing countries is largely constrained by a shortage of capital, policies to promote public and private savings have a special role in adjustment programs that emphasize growth. For the public sector such policies should aim to improve the fiscal position; in the case of private savings the focus has mainly been on interest rate policies.

Interest rate policies influence not only short-run changes in spending, inflation, and external finance but also the longer-term accumulation of financial assets and the level and composition of investment.¹⁰ The basic theory is illustrated in figure 1, in which the horizontal axis measures real private savings and investment, and the vertical axis measures the real return on saving and the real cost of capital; the volume of investment (I) is assumed to be inversely related to the cost of capital (r).¹¹ The total supply of finance for domestic investment consists of domestic savings, S_D , plus foreign saving (capital inflows), S_F . The horizontal sum of saving from the two sources ($S_D + S_F$) is assumed to be an upward-sloping function of the real return.¹² Both the investment and savings curves are drawn for a constant level of real income.

Suppose that, as a result of domestic inflation plus ceilings on interest rates, the real return on savings is initially equal to r_o . At this interest rate the total supply of savings available for domestic private investment is equal to OD , while the private demand for savings is equal to OC . Since the amount of private investment that can actually be undertaken is limited by the supply of savings, the interest rate ceilings imply that the economy will be stuck at point A, where there is a continuous excess demand for investment funds equal to DC . If interest rate ceilings were eliminated, equilibrium would occur at some real interest rate r_e above r_o ; thus, to the extent that the supply of either domestic or foreign savings is interest elastic, savings would increase. The new equilibrium at E would involve both a higher real domestic interest rate, r_e , and a higher equilibrium level of both savings and private investment, OH . The private sector's current account deficit would rise from FD to GH ; but this larger deficit would reflect a higher level of private investment, financed by foreign savings, rather than a lower rate of total savings. This analysis suggests that removing interest rate ceilings would yield a higher rate of domestic private investment.

In many developing countries the financial system is tightly controlled by government, and ceilings are placed on nominal interest rates. With inflation, such controls have resulted in strongly negative real rates of interest (defined as the nominal interest rate adjusted for anticipated inflation). Real financial savings have therefore grown less rapidly than the real economy; and disintermediation, particularly through parallel or curb markets, has been a serious problem. Such developments can sharply restrict the availability of credit through the financial system and thereby inhibit the level and efficiency of investment. Since available credit is often allocated first to large firms and

Figure 1

state enterprises, finance for small and medium-size firms and for households can be severely rationed; as a result, uneconomic projects are often undertaken at the expense of more efficient ones.

To increase the volume of credit, interest rates need to be raised and the financial system made more efficient. This requires, at a minimum, considerable judgment about inflation during the program. In particular, a government has to reassure domestic savers that they will earn real returns that are competitive with those abroad. This assurance is an essential step to promoting balance of payments adjustment, increasing foreign investment, and preventing capital flight. It should be noted, however, that the empirical evidence for developing countries indicates that the effect of variations in interest rates on savings can be quite small (Khan and Knight 1985). As such, to raise the rate of savings significantly may require quite large increases in real interest rates.

Changes in interest rates and reforms of the financial system must be coordinated with the other measures in a stabilization program. Experience suggests that this coordination is especially important during the early phases of the program. In particular, certain combinations of policies can disrupt a financial system that is undergoing structural change. The fiscal accounts must be brought under control to avoid sharp changes in the flow of funds in and out of the financial system. And interest rate policy has to be coordinated with exchange rate policy to ensure that capital movements do not destabilize the financial reform.

Although attention has been paid to the relationship between savings (financial and real) and rates of return, other aspects of savings behavior have also to be considered. One is the relationship between public and private savings: if public and private savings were pure substitutes, an adjustment program that required more public savings (as most programs do) would cause a corresponding reduction in private savings, and total domestic savings would remain unchanged. A second issue is the effect that capital inflows have on domestic savings, both public and private. If extra foreign savings—that is, an increase in the current account deficit—were to reduce domestic savings, the total resources available to the country would be unchanged.¹³ In general, if the supply curve for foreign capital is upward sloping, the level of domestic savings (and investment) will depend directly on the amount of foreign savings. Even though such offsets are unlikely to be complete, governments need to ensure that other policies, such as raising real rates of return and widening the range of savings instruments, can compensate for the possible negative effects of public and foreign savings on domestic private savings.

Despite the weight put on private investment in the adjustment process, much uncertainty surrounds the factors that influence invest-

ment decisions in developing countries. The rich theoretical literature on investment yields a well-defined class of models, generally of the flexible accelerator type. There is, however, a large gap between this theory and the models that have been specified for developing countries. The standard investment models have to be adapted for the structural features of developing countries—the absence of well-functioning financial markets, the relatively large size of government in the investment process, distortions created by foreign exchange controls, wage rigidities—and the adaptation has not been easy (see Blejer and Khan 1984). What is needed is a clearer idea of the theoretical and empirical links between policy variables and private investment, so as to evaluate the influence that government can exercise over the private investment decisions that change current and future growth rates.

Assuming that investment is successfully increased, what impact would it have on growth? This question can be addressed through a model that relates economic growth to increases in the factors of production, as well as technical progress and the use of imported inputs. Attempts at this type of analysis have been only partially successful. One problem is that the identifiable factors listed above can account for only a relatively small proportion of the variation in growth rates over time or across countries. The rest remains unexplained; it could reflect changes in the efficiency of investment, changes in human capital (education, skills, and health), or exogenous events. Identifying these factors and deciding whether they can be influenced by government policies is a task facing researchers.

Exchange rate action to improve international competitiveness and increase the incentive to produce tradable goods is often the centerpiece of any adjustment effort. Since devaluation, in the terminology of Johnson (1958), is simultaneously an expenditure-reducing and expenditure-switching policy, it affects both domestic absorption and domestic supply and thus contains elements of both demand management and structural policies.

Exchange Rate Policies

The demand-side and supply-side aspects of devaluation have been discussed extensively (see, for example, Guitian 1976 and Dornbusch 1981). Consider, for example, a country in which excess real domestic demand shows up in a current account deficit. A devaluation increases the level of foreign prices measured in domestic currency terms and thus, in the domestic economy, the price of tradable goods relative to nontraded goods. On the demand side, the effect of a devaluation on domestic absorption is unambiguously negative: the rise in the price level reduces the real value of private sector financial assets and also of those factor incomes whose nominal values do not rise proportionally with the devaluation. On the supply side, however, devaluation

will boost output if the prices of (variable) domestic factors of production rise less than proportionately to the domestic currency price of final output in the short run (see Khan and Knight 1982).

Thus, both the demand and supply effects of a devaluation work to reduce excess demand and the current account deficit. The question of whether total output rises or falls as a result of the devaluation obviously hinges on whether the contractionary effects on demand are outweighed by the stimulus to supply. This depends, among other things, on the relative price elasticities of imports and exports, on the shares of tradable and nontradable goods in total production, and on the other policies adopted at the same time.

This analysis is, of course, straightforward, but it highlights the importance of getting the "right" real exchange rate. Four issues are involved: (a) determining the degree of overvaluation and therefore the size of the real depreciation required, (b) achieving the target value for the real exchange rate, (c) establishing the effects of a change in the real exchange rate, and (d) deciding what exchange rate regime or rules to adopt.

Determining the Extent of Adjustment

The issue of determining how far an exchange rate is overvalued is an extremely complicated one, even for industrial countries. In developing countries it has become common practice to employ purchasing power parity (PPP) calculations, such as indexes of real exchange rates based on some combination of export and import weights. These indexes are especially useful when prices are rising considerably faster at home than abroad; in those circumstances, judgments about the broad scale of devaluation that is needed can be reasonably sound. However, it would be wrong to attach great importance to small changes in such indexes, and the usefulness of any index is limited unless it is considered along with additional information. Judgments about the required scale of devaluation are usually based on the assumption that a particular rate in the past was "correct" and is therefore the basis for a target; such reasoning should not, however, ignore the influences of economic events that have occurred in the meantime.

To these complications should be added the fact that a real exchange rate is an endogenous variable that responds to several factors. For example, as shown by Khan (1986), exogenous foreign shocks such as a worsening of the terms of trade, an increase in foreign real interest rates, or a slowdown in the world economy will all tend to depreciate the long-run real exchange rate. Similarly, domestic supply shocks will alter the equilibrium real rate. In judging the appropriateness of the real exchange rate the factors affecting its long-run behavior have to be taken into account.

Achieving a Target Rate

Once a target for the real exchange rate has been set, policies to achieve it must be chosen. In principle, it would be possible to hold the nominal exchange rate constant and adopt deflationary policies to force down domestic prices and wages. In practice, prices and wages tend to be sticky, so deflation by itself would likely cause substantial falls in output and employment. Nor would a nominal devaluation be enough on its own: without supporting policies that limit the increase in domestic prices, it would have only a transitory effect on the real exchange rate. In the long run domestic prices will rise by the full amount of the devaluation, returning the real exchange rate to its original level. The extent to which nominal exchange rate action affects the real exchange rate—and for how long—depends directly on the supporting measures—fiscal, monetary, trade, and wage policies—that are adopted.

To calculate the effects of a devaluation on the real exchange rate requires information on substitution elasticities between tradable and nontradable goods in consumption and production and on the share of tradable goods in total expenditure.¹⁴ This is the first-round effect, which will be sustained only if supporting policies are implemented. To determine the real exchange rate in the long run requires detailed information on these other policies; without it, the real exchange rate, for a given nominal devaluation, cannot be predicted with certainty.

Establishing the Effects of Devaluation

One of the standard arguments against devaluation as a policy of adjustment is that it increases unemployment and tends to induce stagflation (see, for example, Diaz-Alejandro 1965, Cooper 1971, Krugman and Taylor 1978, and Hanson 1983). This is by no means a foregone conclusion: as long as devaluation alters the real exchange rate by raising product prices in domestic currency relative to factor incomes, it will raise output to the extent that the short-run marginal cost curves of the tradable goods industries are upward sloping. The longer a real devaluation persists, of course, the greater the benefits. Furthermore, if the wealth and distributional effects of devaluation stimulate savings and investment, they may produce a long-run gain of increased capacity.

Despite the controversy over the output and employment effects of devaluation, the empirical evidence on the subject is surprisingly thin—and inconclusive (see, for example, the studies described in Khan and Knight 1985). Basically, the direction and magnitude of the growth effects depend on such issues as the extent and duration of the real exchange rate change, the structure of production, and the re-

sponses of trade to relative price changes. If devaluation does alter the distribution of income (as it is designed to do), it will not be completely costless to some sectors. There is no strong empirical evidence, however, that devaluation necessarily reduces the overall growth rate and increases unemployment. Of more relevance are the short- and long-term effects of devaluation on trade; here the empirical evidence points to relative price elasticities that satisfy the Marshall-Lerner conditions. What needs exploring is whether the result extends to the case where imported inputs loom large in the production of exports and where those imported inputs are constrained by the availability of foreign exchange.

Deciding on Exchange Rate System

Very few developing countries operate a freely floating exchange rate. Most either maintain fixed parities or follow some type of crawling peg rule.¹⁵ Although there may be advantages in fixing the rate, there are several disadvantages, which have been described at length in the literature. One is that a fixed rate is vulnerable to speculative attacks, producing exchange rate crises if the authorities are unwilling to alter the rate (see, for example, Blanco and Garber 1986).

At the other extreme, high-inflation countries have continual devaluation built into their economic system. For them, devaluation can often be regarded merely as one form of indexation. The key decision is at what rate the domestic currency should depreciate; this depends on several considerations, especially monetary and fiscal policies.

Recently some economists have questioned the use of exchange rate rules, arguing that they increase fluctuations in output or increase inflation and thus are inconsistent with macroeconomic stability (see, for example, Dornbusch 1982). Also at issue is how and when rules that are designed to keep the real exchange rate constant (or depreciating slowly) should change when circumstances dictate.

Confronted with persistent balance of payments problems, some countries have resorted to a dual exchange system rather than devaluing to a uniform exchange rate. Under the dual system, some transactions take place at an official exchange rate maintained by intervention, with the rest at a generally lower ("free" or "parallel") exchange rate, which is usually determined by market forces. Dual exchange markets have not always been successful in achieving their objectives. In particular, they have been largely ineffective in preventing speculative outflows of capital and the overinvoicing of imports and underinvoicing of exports (if there is a large differential between the rates). In addition, dual exchange rates are equivalent to a series of implicit subsidies and taxes that may be undesirable in themselves. For example, commodities that are assigned to the official market face an

implicit tax on exports—from a government that may be seeking to promote exports.

*External
Financing
Policies*

It is generally thought that, because developing countries face a scarcity of capital, they should be net foreign borrowers. The rate at which they borrow abroad—the “sustainable” level of foreign borrowing—depends on the links between foreign and domestic savings, investment, and growth. The main lesson of the “growth with debt” literature is that a country can and should borrow abroad as long as the capital produces a return to cover the cost of the borrowing (see McDonald 1982). In that case the borrower is increasing capacity and expanding output with the aid of net foreign savings.

In theory it may be possible to calculate the sustainable level of foreign borrowing, based, for example, on information about the terms, maturity, and availability of foreign capital. In practice this is a nearly impossible task, since such information is not readily available.¹⁶ Using such ratios as debt to exports or debt to GNP can be helpful guides. However, it is very difficult to determine the “sustainable” level of such ratios. A country that can profitably use foreign savings that are large relative to domestic savings will have a debt to exports ratio that is higher than that of a country less able to use foreign savings profitably. The equilibrium level of such ratios will vary from country to country and for a given country over time. It has not proved possible, even after the fact, to measure the factors that predict sustainable ratios with any accuracy.

Perhaps the chief practical value of empirical measures is that they give warning when debt might grow explosively. If extra borrowing increases the debt service burden more than a country's capacity to carry the burden, this must be reversed through expanding exports or cutting imports. If it is not, and conditions do not change, more borrowing will be needed to make payments, and debt will grow faster than the capacity to service it. A convenient way of stating this condition is that the real interest rate on new loans must be less than or equal to the expected growth in the volume of exports.¹⁷

Although it may be difficult to see how indicators of debt capacity relate to the criteria for foreign borrowing discussed in the theoretical literature, there are circumstances in which the proxies can be useful. For example, an unexpected rise in the real interest rate on foreign debt can make the service payments excessive relative to the perhaps unchanged outlook for a country's exports. Moreover, a country's debt service capacity could deteriorate because of unwise domestic policies that damage its export performance. Finally, less favorable external factors—such as the slow growth of trading partners or a fall in the terms of trade—might produce an explosive growth of debt. In

practice, therefore, the theory of real resource transfers is probably most useful as a warning of when the various debt ratios are changing or are expected to change rapidly.

In recent years the sharp decline in the supply of foreign capital has created adjustment difficulties for many developing countries. When private creditors have already decided that a country's position may not be sustainable, the short-term outlook for its current account depends on the availability of official financing. To the extent that the country cannot influence its receipts of official finance, it can do little to decide how to adjust its current account. The issue remains, however, as to what policies will allow a quick and relatively costless return to normal borrowing.

The theory of growth with debt is not an ideal guide for policy during such transitions (see Selowsky and van der Tak 1986). The obvious, but not very helpful, criterion is that the necessary adjustment should be accomplished with the least possible loss of output. One practical consideration is that imports should not be compressed to a point which causes an unnecessary loss of output and (to the extent that exports require imported inputs) exports. It should be recognized that there may be little room to maneuver when credits from private sources are withdrawn—though official finance obviously plays an important role. However, if an adjustment program carries credibility for the medium- and long-term, it can hasten the restoration of a country's creditworthiness.

Most discussion of capital flows to developing countries has focused on foreign borrowing, but some recent research has drawn attention to capital flowing the other way—"capital flight"—and the problems this has caused for developing countries (see, for example, Dornbusch 1985 and Khan and Ul Haque 1985). Dornbusch (1985) contends that capital flight has increased gross foreign debt, eroded the tax base, and (to the extent that there was a net real transfer of resources from the countries) reduced investment and growth. If foreign borrowing has merely financed capital flight rather than productive investment, then what is to prevent future loans from leaking out in the same way?

Although there is some theoretical support for the notion that expected devaluations and negative interest rate differentials drive capital abroad, the effects of macroeconomic changes are seldom so straightforward. Such changes will generally be recognized by both residents and nonresidents at the same time, limiting the incentives for trade between them. Some market imperfection is usually needed in order to make transactions happen. For example, where a government is maintaining an unrealistic exchange rate *and* where the private sector cannot acquire domestic securities denominated in foreign currencies, outflows of private capital would be expected.

In addition to the macroeconomic causes behind capital flight, there are many influences on where and how investors hold their wealth: actual and expected taxes, subsidies, and controls that various governments impose on private wealth. The effort to impose a differential tax on investment income, for example, will be counterproductive since revenue can rapidly disappear as the tax base shrinks. That said, it should be recognized that a government is most unlikely to prevent all private capital outflows even in the best of circumstances, since many of the causes of capital flight are beyond its control.

This article has had two purposes: to identify the policies needed for a macroeconomic adjustment and to describe the links between them and the ultimate objectives of an improvement in the balance of payments, slower inflation, and faster economic growth. The resulting policies would be designed simultaneously to reduce demand and raise supply (especially of tradable goods). This article has shown that the links between policies and objectives are complex, with large gaps in knowledge on both theoretical and empirical grounds.

The set of policies proposed in this article would be broadly acceptable to most economists concerned with macroeconomic adjustment in developing countries. For example, in one of the few concrete expositions of an adjustment strategy, Diaz-Alejandro (1984) suggests a package containing many of the elements described here. Considering a country with an unsustainable current account deficit and high inflation, he proposes: fiscal and monetary restraint to reduce aggregate demand; elimination of distortions; guidelines on incomes and wages; gradual liberalization of imports; incentives for exports; a crawling peg regime, with the real exchange rate undervalued to support export promotion and import liberalization; and positive real interest rates to encourage savings. The "real economy" approach advocated by Killick and others (1984) is another example of specific proposals for adjustment that are consistent with the package described here. Their approach basically emphasizes structural policies at the sectoral level, in addition to measures to curb excess demand.

Although economists may agree on the policies to be implemented, they disagree on how these policies work to achieve their goals. This is especially true of measures that are essentially microeconomic but have macroeconomic implications. It has to be recognized that the analytical basis for some micro policies in an adjustment program is relatively weak. The theory underlying the effects of eliminating distortions (real and financial) is not well suited to policymaking, as it quickly raises welfare issues. For example, whether removing consumer subsidies will raise overall efficiency and production is still an open question; the same is true of a devaluation.

Conclusions

Even on the macroeconomic front, some serious theoretical and empirical issues are still unresolved. This article has shown, for example, that the effects of fiscal policy on demand are ambiguous. Another example is the issue of savings: since raising private savings is central to programs emphasizing long-term growth, it is crucial to establish the theoretical and empirical links among private and public savings, interest rates, and exchange rates. Finally, and perhaps most important, there is still much to be learned about what drives growth in developing countries and in particular about the relationship between short-run stabilization policies and long-run growth.

Many of these questions will have to be answered through concerted empirical analysis. Even when the theoretical underpinnings of the relevant relationships are clear, economic theory provides a guide only to the basic equilibrium relationships. It does not give information on how long it takes for a change in an exogenous variable or policy instrument to affect the endogenous variable. Such questions concerning dynamics and lags in adjustment obviously have to be approached from an empirical standpoint, and thus empirical analysis will be crucial in designing an adjustment package.

This article has provided only general guidelines on the type of measures to be included in an adjustment program. It has not defined the appropriate mix of demand management, structural, exchange rate, and external financing policies, or the sequencing of these policies. An analysis of these issues would require detailed theoretical and empirical knowledge of the relationship between policies and objectives. However, this would not in itself be enough, since the ways in which policies are combined depend on several other factors—including the relative weights assigned to a program's objectives. If, for example, an improvement in the current account is considered a high priority, more stress would be put on demand management and exchange rate policies; whereas the achievement of faster medium-term growth would involve more emphasis on structural policies. Equally important in deciding on the mix of policies would be the initial conditions—the external payments of foreign debt, the rate of inflation, and the level and growth of per capita income—when the program is implemented. The period over which adjustment is to be achieved also has an obvious bearing on the choice of policies. Since structural policies generally act with a lag, the longer the adjustment period, the easier they are to adopt. Finally, the choice of policies would be dictated by the characteristics of the country in question. For example, in countries where indexation is important and inflation has become ingrained, policies to restrain demand may turn out to be very costly in terms of output and employment.

Although countries differ, all need to have an analytical framework for their adjustment programs. Such a framework is possible. But as

this article has tried to show, many issues are still up in the air. Until they are settled, programs will have to rely on a great deal of judgment about the ultimate consequences of policy actions.

A comprehensive macroeconomic adjustment program is expected to have the following objectives: a sustainable current account position, a stable and high rate of economic growth that would allow for a steady rise in per capita consumption, a reduced rate of inflation, and a manageable level of foreign debt. The package designed to meet these objectives would typically include policy measures that simultaneously restrain aggregate demand and increase the availability of resources. These policies may be grouped as follows: demand-management policies, structural policies, exchange rate policies, and external financing policies. This article describes how these policies can be expected to achieve the goal of macroeconomic adjustment. The focus is primarily on the theoretical and empirical links between policy instruments and ultimate objectives. An examination of these links is necessary before issues of the appropriate mix of demand-management, structural, exchange rate, and external policies, and the sequencing of these policies in a program, can be properly addressed.

Abstract

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Notes

1. Adjustment programs of the International Monetary Fund (IMF), for example, are described by some observers as being primarily demand-oriented. See Dell (1982) and Diaz-Alejandro (1984). While demand-side policies were stressed in earlier IMF work on financial programs, namely by Polak (1957) and Robichek (1967), this is not necessarily a valid description of contemporary programs.

2. The assumption of the curb market allows one to analyze interest rate effects on aggregate demand. In the absence of such a market, monetary policy would have only wealth effects.

3. This is basically Tobin's well-known Q mechanism.

4. Additional wage and price policies, including price freezes, may well be called for if inflation has an inertial component that is unrelated to excess demand pressures.

5. The consequences of macroeconomic policies on the labor market in developing countries is not well established at the theoretical level, so there is also very little empirical evidence on this relationship.

6. It has been argued by Lucas (1972), among others, that the more that changes in monetary policy are anticipated by the private sector, the smaller the effect on output. For a discussion of the applicability of rational expectations models to developing countries, see Corden (1985).

7. For a discussion of this effect in the context of developing countries, see Corden (1985).

8. This "policy neutrality" has come to be known as the Lucas-Sargent-Wallace (LSW) proposition; see Lucas (1972) and Sargent and Wallace (1975).

9. Even the empirical evidence for industrial countries does not suggest that changes in public saving are entirely offset by private saving.

10. This view is generally referred to as the McKinnon-Shaw hypothesis; see McKinnon (1973).

11. This analysis is taken from Khan and Knight (1982).

12. Even if domestic savings are relatively unresponsive to the rate of interest, the economy could obtain a larger proportion of world savings and thus increase total savings ($S = S_D + S_F$).

13. The simple analysis of figure 1 assumed that foreign and domestic savings were independent.

14. A limiting case is that of constant prices of nontradable goods. The impact of a devaluation on domestic prices is then simply the product of the exchange rate change and the share of tradable goods in expenditure. The depreciation of the real exchange rate would, therefore, be equal to the nominal devaluation adjusted for the resulting increase in domestic prices. See Khan and Lizondo (1987).

15. The 1985 annual report of the IMF lists fifty developing countries as having fixed pegs to a single currency; thirty-eight as being pegged to a currency composite; twenty-nine as following an exchange rate rule; and only seven countries as floating.

16. Furthermore, any such calculation depends on assumptions about the effect of future interest rates on existing and new debt. What might be considered sustainable at a given interest rate may prove unsustainable at a higher rate. Since most commercial debt carries a floating interest rate, calculations based on some fixed rate are bound to be conjectural at best.

17. Strictly speaking, this result assumes that the growth rate of imports is less than or equal to the growth rate of exports.

References

- Balassa, Bela. 1982. "Structural Adjustment Policies in Developing Economies." *World Development* (January): 23-38.
- Barro, Robert J. 1974. "Are Government Bonds Net Wealth?" *Journal of Political Economy* (December): 1095-117.
- Blanco, Herminio, and Peter M. Garber. 1986. "Recurrent Devaluation and Speculative Attacks on the Mexican Peso." *Journal of Political Economy* (February): 148-66.
- Blejer, Mario I., and Mohsin S. Khan. 1984. "Government Policy and Private Investment in Developing Countries." *IMF Staff Papers* (June): 379-403.
- Bond, Marian E. 1983. "Agricultural Responses to Prices in Sub-Saharan African Countries." *IMF Staff Papers* (December): 703-26.
- Cooper, Richard N. 1971. *Currency Devaluation in Developing Countries*. Essays in International Finance 86. Princeton, N.J.: Princeton University, Department of Economics, International Finance Section.
- Corden, Max. 1985. "The Relevance for Developing Countries of Recent Developments in Macroeconomic Theory." Cambridge, Mass.: Harvard University.
- Dell, Sydney. 1982. "Stabilization: The Political Economy of Overkill." *World Development* (August): 597-612.
- Díaz-Alejandro, Carlos. 1965. *Exchange Rate Devaluation in a Semi-Industrialized Economy: The Experience of Argentina 1955-1961*. Cambridge, Mass.: Boston University Press.
- _____. 1984. "IMF Conditionality: What Kind?" *PIDE Tidings* (January-February): 7-9.
- Dornbusch, Rudiger. 1980. *Open Economy Macroeconomics*. New York: Basic Books.
- _____. 1982. "PPP Exchange Rate Rules and Macroeconomic Stability." *Journal of Political Economy* (February): 158-65.
- _____. 1985. "External Debt, Budget Deficits and Disequilibrium Exchange Rates." In J. Cuddington and G. Smith, eds. *International Debt and Developing Countries*. Washington, D.C.: World Bank.
- Edwards, Sebastian. 1984. *The Order of Liberalization of the Balance of Payments*:

- Should the Current Account Be Opened Up First?* World Bank Staff Working Paper 710. Washington, D.C.
- Frenkel, Jacob A., and Harry G. Johnson, eds. 1976. *The Monetary Approach to the Balance of Payments*. London: Allen and Unwin.
- Guitian, Manuel. 1976. "The Effects of Changes in the Exchange Rate on Output, Prices and the Balance of Payments." *Journal of International Economics* (February): 65–74.
- Hanson, James A. 1983. "Contractionary Devaluation, Substitution in Production and Consumption, and the Role of the Labor Market." *Journal of International Economics* (February): 179–89.
- International Monetary Fund (IMF). 1977. *The Monetary Approach to the Balance of Payments*. Washington, D.C.
- _____. 1985. *Annual Report 1985*. Washington, D.C.
- Johnson, Harry G. 1985. "Towards a General Theory of the Balance of Payments." In *International Trade and Economic Growth*. London: Allen and Unwin.
- Khan, Mohsin S. 1986. "Devaluation and the Real Exchange Rate." DRD Discussion Paper DRD170. Washington, D.C.: World Bank, Development Research Department.
- Khan, Mohsin S., and Malcolm D. Knight. 1981. "Stabilization Programs in Developing Countries: A Formal Framework." *IMF Staff Papers* (March): 1–53.
- _____. 1982. "Some Theoretical and Empirical Issues Relating to Economic Stabilization in Developing Countries." *World Development* (September): 709–30.
- _____. 1985. *Fund-Supported Adjustment Programs and Economic Growth*. IMF Occasional Papers 41. Washington, D.C.: International Monetary Fund.
- _____. 1986. "Developing Country Exchange Rate Policy Responses to Exogenous Shocks." *American Economic Review* (May): 84–87.
- Khan, Mohsin S., and J. Saul Lizondo. 1987. "Devaluation, Fiscal Deficits, and the Real Exchange Rate." *World Bank Economic Review*. Forthcoming.
- Khan, Mohsin S., and Nadeem Ul Haque. 1985. "Foreign Borrowing and Capital Flight: A Formal Analysis." *IMF Staff Papers* (December): 606–28.
- Killick, Tony, ed. 1984. *The Quest for Economic Stabilization: The IMF and the Third World*. London: Heinemann Education Books in association with Overseas Development Institute.
- Krueger, Anne O. 1985. "How to Liberalize a Small, Open Economy." In Michael Connolly and John McDermott, eds. *The Economics of the Caribbean Basin*. New York: Praeger.
- _____. 1986. "Aid in the Development Process." *World Bank Research Observer* 1, no. 1 (January): 57–78.
- Krueger, Anne O., and others, eds. 1981. *Trade and Employment in Developing Countries*. Vol. 1: *Individual Studies*. Chicago: University of Chicago Press.
- Krugman, Paul, and Lance Taylor. 1978. "Contractionary Effects of Devaluation." *Journal of International Economics* (August): 445–56.
- Lucas, Robert E., Jr. 1972. "Expectations and the Neutrality of Money." *Journal of Economic Theory* (April): 103–24.
- McDonald, Donogh C. 1982. "Debt Capacity and Developing Country Borrowing: A Survey of the Literature." *IMF Staff Papers* (December): 603–46.
- McKinnon, Ronald I. 1973. *Money and Capital in Economic Development*. Washington, D.C.: Brookings Institution.
- Polak, Jacques J. 1957. "Monetary Analysis of Income Formation and Payments Problems." *IMF Staff Papers* (November): 1–50. Reprinted in IMF 1977.
- Robichek, E. Walter. 1967. "Financial Programming Exercises of the International

- Monetary Fund in Latin America.” Address to a seminar of Brazilian professors of economics, Rio de Janeiro, September.
- Sargent, Thomas J., and Neil Wallace. 1975. “Rational Expectations, the Optimum Monetary Instrument, and the Optimal Money Supply Rule.” *Journal of Political Economy* (April): 241–54.
- Sen, Amartya K. 1983. “Development: Which Way Now?” *Economic Journal* (December): 745–62.

SOME THEORETICAL ASPECTS OF AGRICULTURAL POLICIES

Joseph E. Stiglitz

In virtually every country, developed and developing alike, governments intervene in agricultural markets. They subsidize farmers (mostly in developed countries); they tax farmers (mostly in developing countries);¹ they try to stabilize prices; they impose import tariffs and quotas; they restrict production; they provide food subsidies for urban areas; they support the use of fertilizer; they build irrigation systems; they offer extension services; they try to control marketing; and they provide credit, often below market rates. These programs have been at the center of growing controversy. They often impose huge financial burdens on the government and generate allocative inefficiencies in countries that are poor enough already. Yet governments in developing countries often seem to doubt the advice offered from the developed countries to abandon these policies, when the developed countries engage in not dissimilar practices themselves.

This article aims to provide a systematic framework within which to assess these various programs.² The circumstances of individual countries differ so much that no single prescription would be appropriate for all. But the framework in this article should be useful for considering a wide range of cases.

A useful starting point is to ask, What are the legitimate reasons for government intervention in agricultural markets? In particular, what makes the market's own allocation either inefficient or otherwise "unacceptable"? There is a standard litany of such reasons; five are relevant to agriculture.³

1. *Incomplete markets in insurance futures and credit.* Farmers cannot get complete insurance against the big (output and price) risks they face. Rural credit markets, like agricultural insurance markets,

*The Market
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Failures
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are notoriously imperfect. Farmers' access to credit is limited, if they can obtain it at all. They often have to pay usurious interest rates, though this may have something to do with the likelihood of default.⁴

2. *Public goods and increasing returns.* These provide the justification for governments to finance water projects. In some cases, the marginal cost of using irrigated water, once the dam has been built, is relatively low, and the cost of monitoring water usage is relatively high. Water projects therefore satisfy both the criteria of pure public goods. The provision of water is almost always a natural monopoly, and a common (though not universal) response to such monopolies is production by government.

3. *Imperfect information.* Government supply of information can be thought of as a type of public good. (Where the government ascertains what crops grow best in a particular area, the information is best described as a local public good.) However, disseminating information is costly, and the benefits accrue mainly to those who receive it. So it is probably wrong to think of agricultural extension as a pure public service. It may be justified, however, by the next category of market failure.

4. *Externalities.* The successful adoption of a new technology by one farmer conveys valuable information to his neighbors and hence gives them a significant externality. The existence of this externality has been used to justify subsidies for farmers to adopt new technologies.

5. *Income distribution.* Perhaps the most important reason for government intervention in agriculture is concern with the distribution of income generated by free markets. Given the initial holdings of assets, this distribution need not, and often does not, satisfy society's ethical judgments. In particular, it may result in significant numbers of people having unacceptably low incomes or supplies of food.⁵ This suggests the government should design programs that increase the incomes of small farmers—and, for urban dwellers, a program of food subsidies.⁶

Though this list provides various rationales for government action, the link between them and actual government policies may be tenuous. Thus, measures aimed at reducing risk (like price stabilization programs) may actually increase the riskiness of farmers' income, and they often entail large subsidies.⁷ Though government policies may be defended in terms of helping the small farmer, the main beneficiaries may be large farmers. And though governments may claim that their policies redistribute income, the net impact of the programs may be regressive.⁸

Critics of government programs thus claim that market failures are matched by a corresponding list of government failures (see Stiglitz 1986). The fact that markets face certain problems does not in itself justify government intervention; it only identifies the potential area for it. This caveat is particularly important in any assessment of public

remedies for those market failures affected by imperfect information (for instance, imperfect credit markets), since the government is likely to face similar problems if it intervenes.⁹

To understand the nature of government interventions in agricultural markets, one must approach the problem from the perspective of the *second best*. Whether government or market failures are of greater importance may differ from country to country, and this will crucially affect the nature of the appropriate government policy. Failure to recognize this fact has given rise to much of the controversy over state intervention. Simplistic views—such as “governments should not intervene in free markets”—or even the more sophisticated view (based on optimal tax theory for developed countries) that “government should not impose trade taxes” become inappropriate once it is recognized that the government has limited instruments for collecting revenue (thus, some distortionary taxation is necessary) and for redistributing income (so that the surest way of improving the lot of the rural poor may be through trade taxes).¹⁰ But the prescription that the government use trade taxes to redistribute income may be inappropriate when the redistributive impact of trade taxes is likely to be regressive.¹¹

An analysis of the appropriate policy for a particular country must therefore begin by specifying the reasons for market failure and the instruments the government can use to remedy it. The role of general theories is to identify the circumstances under which one kind of policy is more likely to be appropriate, thereby developing a taxonomy for analyzing policies in different countries.¹² The models for specific countries help to frame the policy discussion. They enable one to establish whether the source of disagreement over policy is differences in objectives (welfare weights associated with different groups or between current generations and future generations); or differences in views about the structure of the economy; or differences in views about the values of key parameters (see Atkinson and Stiglitz 1980).

The following sections organize the evaluation of alternative policies around several themes: risk, incentives, credit, redistribution, dynamic effects, food subsidies, and considerations of political economy.

Most economists acknowledge that farmers face significant risks and have only limited opportunity to avoid them through insurance and other markets. However, appropriate remedies are the subject of theoretical and practical disagreement.¹³

Risk

What is of crucial importance to farmers is stabilizing their *income*, not stabilizing the prices of their produce. If price and quantity are negatively correlated, stabilizing prices may actually exacerbate the fluctuations in income.

Some economists favor the use of futures markets. These have the

advantage of allowing a farmer to choose how much of his crop to sell forward, to "adapt" the extent of price stabilization to his own circumstances and preferences. But futures markets have two important drawbacks. First, they involve bigger transactions costs than those price stabilization schemes that work through the market. To the extent that such schemes serve to stabilize incomes, they do so without any farmer taking special action for himself. Second, to the extent that crop sizes are uncertain, no farmer can completely hedge his position unless he purchases crop insurance (which in general is unavailable). These disadvantages are not necessarily as bad as those produced by schemes in which the government does not stabilize the market price, but makes separate agreements with different farmers to buy given amounts of a crop at a guaranteed price.

Despite their transactions costs, futures markets dominate most types of price stabilization schemes. The intuitive reason is that futures markets allow the farmer to choose how much he wishes to divest himself of price risk.¹⁴ However, even in developed countries in which futures markets exist, farmers have not (at least until recently) used these markets to any significant extent.¹⁵ Thus, it remains an open question whether futures markets could be an effective way of sparing small farmers from risks.

If governments decide to stabilize prices, they have several ways to do so. They can, for instance, use buffer stocks, which can be operated according to various rules. Perfect price stability is, in essence, impossible. Even simple rules, such as setting a band within which prices can move, are not immune to speculative attack.¹⁶ The only generally feasible rules involve prices being a function of the size of the current stock; as the amount in storage decreases, the government allows the price to rise.

The limited calculations done so far suggest that the welfare gains from well-designed rules may be significantly greater than those from certain simple rules, such as keeping prices within a band (even if that were possible).¹⁷ Indeed, questions may be raised about the significance of the latter gains altogether (Newbery and Stiglitz 1982). As for buffer stocks, a major criticism is that it is usually more efficient to store general purchasing power than specific commodities—that is, to use savings and reserves—except when transport and transactions costs are large.

Another way for governments to try to affect price variability is to impose trade restrictions. These may have marked transactional advantages over other forms of price stabilization, though they may be less effective in stabilizing incomes. It is now widely recognized that, in the presence of uncertainty (and with limited governmental ability to respond to changing circumstances), quotas and tariffs are not interchangeable. Tariffs do not insulate a country from foreign-

induced price fluctuations, but quotas may do so. Quotas are particularly effective when the source of price fluctuations is neither domestic demand nor supply; they can then completely insulate the producers from foreign shocks (at the cost, of course, of preventing a country from taking full advantage of its current comparative advantage). Quotas are also effective in the extreme case in which the only source of variability is domestic output; they then serve to raise prices whenever farmers are suffering from lower volume. Even in these circumstances, however, it is not clear that the gains from reducing risk exceed the costs of failing to take advantage of temporary comparative advantage. The calculations depend partly on supply responses.

With any price stabilization scheme, supply responses are a major uncertainty. How do farmers react to a reduction in risk? And to what extent do a government's price stabilization programs serve simply to replace the stabilizing (arbitrage) activities of the private sector? Little empirical work has been done on either of these issues, though the effects can clearly be large: some countries have had to restrict their farmers' production so as to limit the costs of government programs.

Though there often is a role for government intervention to reduce the risks faced by farmers, many of the programs justified on these grounds serve more to redistribute income than to stabilize it. Indeed, in some instances, they may actually increase the variability of income. The appeal of these programs may lie in the way that they conceal the size and allocation of subsidies. Were the subsidies provided more openly, they might not be politically acceptable.¹⁸

The taxes and subsidies in agriculture inevitably influence the behavior of farmers. They affect decisions to be a farmer and to allocate effort and other resources to agriculture. The most common form of influence occurs when governments try to tax agriculture—by taxing farm output directly or, equivalently, by setting up state marketing boards that purchase crops at less than the international price, by taxing export, or by putting tariffs on industrial goods.¹⁹ Lowering the price of farm products obviously reduces the incentives for farmers. Though the supply curve may bend backward in certain circumstances, in general supply will be reduced when taxes get sufficiently high.²⁰ The welfare losses associated with such taxes may be particularly large in sharecropping economies, where the farmer receives between a third and two-thirds of the value of his marginal product.²¹

Economists concerned with incentives favor land taxes over output taxes, since the former are close to the economists' ideal: lump-sum taxes. The central problem, however, seems to be valuing the land. If each acre of land is taxed the same, irrespective of its quality, the tax

Incentives

would be thought unfair. But if the quality of land is judged on the basis of output, then a land tax is virtually the same as an output tax. In many developing countries, land markets are so thin that market price cannot be used; even in developed countries, there is considerable uncertainty about the true value of different properties.

In many countries, governments have tried to mitigate the effects of output taxes by combining them with input subsidies—particularly for fertilizer, seeds, and credit. If all inputs were subsidized to the same extent, such schemes would be equivalent to reducing the output tax. The same results could be achieved with lower transaction costs by cutting the output tax directly. In fact, however, subsidies are never the same for all inputs, if only because some key inputs are unobservable. The schemes therefore cause distortions, boosting the use of subsidized inputs relative to unsubsidized items.

According to the modern theory of the second best, the presence of a distortion does not mean that the subsidy policy is automatically bad; after all, the output tax itself induces distortions. But it is reasonable to suspect that, for raising a given revenue, the combination of taxing and subsidizing is not only transactionally inefficient, but also more distortive than a policy of imposing taxes on outputs and inputs. In other words, the input subsidy not only distorts the input choice, but (because it uses revenue) also requires an even higher tax on output than would otherwise be needed. Recent studies have confirmed this intuition; only under restrictive conditions is it desirable to subsidize inputs and tax output.²² In a sharecropping economy there are some circumstances in which a fertilizer subsidy might be desirable: for instance, the increased use of fertilizer could so raise the *marginal* product of labor that workers are induced to work harder, even though the price they receive for their output is lower. Under those conditions, of course, it would have paid the landlord to subsidize the fertilizer himself; no government subsidy is required (Braverman and Stiglitz 1986).

The same analysis applies in the choice between input subsidies and price supports as a way of encouraging production. Input subsidies introduce an inefficiency in the choice of technique, a distortion that can be avoided by using price supports.²³ (Two further arguments for input subsidies—that they have desirable distributional consequences and beneficial dynamic effects—are discussed later in this article.)

Most developing countries produce several different crops. This raises the question of whether all crops should be subject to a uniform tax and, if taxes vary, which crops should be taxed at higher rates. The question involves both incentive and efficiency considerations. This section discusses only the former, because we have already noted that the key factor in determining the efficiency effects of taxes is the elasticity of supply. This may well differ across crops, suggesting that

the loss in efficiency from taxing inelastically supplied crops may be less than from taxing those with high elasticity.²⁴

One significant set of incentive issues concerns the attractions for rural dwellers of migrating to towns and cities; such migration often gives rise to urban unemployment. Migration naturally responds to differences in real incomes between the two sectors.²⁵ Thus, an increase in the (relative) tax burden on farming may generate a further dead weight loss in extra urban unemployment. The importance of this obviously depends on the supply elasticity of migration, and on the extent of (marginally induced) urban unemployment, which in turn will depend on the degree of wage flexibility in urban areas. In some circumstances, these considerations should play a central role in policymaking.

It is a common observation that farmers in developing countries are unable to obtain credit, or that they can do so only at usurious interest rates.²⁶ This is not, in itself, evidence of a market failure. Interest rates will be high if the probability of default is high—which is indeed often the case. At the same time, the fact that there is imperfect information on the credit risks of different individuals (the adverse selection problem) and on the actions of those individuals (the moral hazard problem) means that the market equilibrium is not, in general, (constrained) Pareto efficient.²⁷

Credit

Nonetheless, government policies to boost credit for farmers need to take account of these adverse selection and moral hazard problems. The government is usually in no better (indeed, often worse) position for gathering information on the varying probabilities of default. Furthermore, a government credit program that involves some discretion in the granting of loans also contains scope for giving subsidies to particular individuals: whenever a “high-risk” farmer is granted a loan for which the interest rate has not been increased accordingly, he is obtaining an implicit subsidy. It is naturally difficult for an outsider to judge whether a subsidy has been granted; precisely for this reason, such programs are open to abuse.²⁸

In spite of the difficulties of designing rural credit schemes, a few have been successful.²⁹ Distilling the lessons of these successes (and the lessons from the many more numerous failures) remains a challenge for researchers.

In developed countries, there is a strong presumption in favor of tackling distribution issues through taxing income rather than commodities.³⁰ This presumption is less strong in developing countries, precisely because of the limited range of redistributive instruments

Redistribution

available to the government. If the government wishes to redistribute income to urban dwellers, the most effective way may be a commodity tax. Since in most developing countries people in rural areas are already worse off than their urban counterparts, such policies are regressive (see Lipton 1971). This suggests that policies which are notionally justified on distributional grounds may have other (for example, political) motivations. This in turn should make one suspicious of differential taxation: differential tax rates can be used to redistribute income not only from rich to poor, but also from poor to rich, from the politically powerless to the politically powerful, from one region to another.

The structure of agricultural prices not only affects the welfare of the rural areas relative to the urban, but also has distributional effects within the countryside. These latter effects are often used to justify taxing one commodity at a lower rate than others (because it is grown mostly by poorer farmers) or subsidizing one input (because it is used mostly by poorer farmers). An assessment of the distributional consequences of such policies needs to consider not only the direct effects, but also the indirect ones—in particular, the effects on the wages paid to landless laborers. Thus, if fertilizer decreases the marginal product of labor (at any level of input of labor), a subsidy on fertilizer might reduce the demand for labor and consequently the landless laborers' wage, in which case the distributional consequences will be regressive.

Ascertaining these "general equilibrium" consequences is seldom straightforward. Moreover, one has to be cautious about using, say, differential input subsidies to achieve certain distributional goals. Wealthier farmers are likely to use more of all inputs, including more fertilizer—so a fertilizer subsidy is likely to benefit them most.³¹ Indeed, in the central case of constant returns to scale, outputs and inputs will be precisely proportional.

In some cases, there may be systematic differences in input-output ratios according to different levels of wealth, because poorer farmers have different qualities of land or because they face different factor prices (or similarly, because rental markets are imperfect, so that the cost per day of using, say, a tractor is greater for them than for richer farmers).³²

Whenever there are systematic differences in input-output ratios, it is possible to redistribute income through a combination of taxes and subsidies. But if the differences are small, of course, taxes and subsidies have to be large to attain even a limited amount of redistribution—and the associated distortions will also be large. In many cases, the amount of redistribution achieved probably cannot justify the distortions caused by policies that simultaneously tax output and subsidize inputs or subsidize some inputs and tax others.

A rather different justification for subsidizing inputs has to do with the adoption of new technologies. If peasants were perfectly rational and risk markets were perfect, then farmers would adopt the new technology if it increased their expected utility. No government subsidy would be needed.

Reality is different: risk markets are imperfect, and peasants are risk averse. Moreover, technologies that are riskier, but offer higher returns, yield more tax revenue for the government. Thus, the government has a real interest in encouraging the adoption of such technologies. If such technologies use a lot of fertilizer, for example, then a fertilizer subsidy may be an effective way of encouraging the adoption of the riskier technologies.

There is an added (and rather distinct) justification for governments to encourage the use of new technologies: when one farmer tries a new technology, he conveys a large amount of information to his neighbors. The presence of these informational externalities implies that farmers will have insufficient incentives for trying new technologies; the solution is to levy corrective (Pigovian) taxes or to provide subsidies.

The conflict between these dynamic efficiency objectives and distributional considerations raises a familiar problem. The farmers that are least risk averse are likely to be the large ones, so they are likely to be willing to try the new technology.³³ Thus, subsidies for those who introduce the new technology are likely to be regressive. (The effect may be exacerbated if the new technologies are also capital intensive, and the larger farmers have easier access to capital markets or can borrow at lower interest rates.)

The issues of pricing food in towns and cities are linked to agricultural pricing policies in several ways. First, the prices received by farmers and those paid by consumers will sometimes have to be the same; the government is unable to prevent the black markets that result when it tries to put a wedge between the two sets of prices. In that case, policies which make farmers better off (by increasing the prices they receive) simultaneously make those in the urban areas worse off. Whether these effects on urban dwellers can, or will, be offset depends on how their wages are determined.³⁴

Second, urban food subsidies are expensive: they increase the amount of revenue that the government must raise from other sources, including taxes imposed on farmers (or, alternatively, they reduce what the government can spend on investment and other programs).

Third, in closed economies, there is a "material balance" condition:

if farmers produce less (because of a tax on their output), then—for demand to equal supply—urban prices must rise. Workers in the urban areas will thus be worse off, unless wages adjust.

Both efficiency and distributional issues arise in the analysis of the structure of taxes and subsidies in urban areas. Efficiency discussions focus on the dead weight loss associated with any tax or subsidy structure. However, it may be misleading to try to borrow from the findings of optimal tax theory, as it has been conceived in developed countries. Central to that theory is the assumption that the economy is at full employment and that taxation distorts the supply of labor. (If the labor supply was, for instance, inelastic, then uniform taxation would be desirable.) As urban unemployment is a serious problem in many developing countries, it is implausible that governments will be much concerned about any slight reduction in the supply of labor.

Moreover, under a variety of hypotheses, it seems reasonable to assume that wages will respond to changes in prices. This will be so if, for instance, workers' productivity depends on the wages they receive and the prices they pay, and firms set their wages to minimize their labor costs (per efficiency unit). In that case, if efficiency depends simply on the level of a worker's utility, uniform taxation is again desirable. But if efficiency is particularly sensitive to food prices (because efficiency depends on nutrition), then it may indeed be desirable to subsidize food. This analysis will obviously vary according to the nature of the job. If workers in urban areas are mainly employed in civil service jobs, where limited physical exertion is needed, the case for food subsidies may be weaker than in more industrialized urban settings.

The distributional effects of urban pricing policies are also likely to depend critically on how far food subsidies can be disaggregated. Thus, a uniform food subsidy is likely to have a smaller redistributive impact than a subsidy limited to millet, while in some countries, a subsidy just for rice may be regressive in its effects. If the government is particularly concerned with the poor yet cannot reach them directly, it may be desirable to have general food subsidies—even though the rich benefit more than the poor.

Considerations of Political Economy

Some of the issues discussed in this article have been a source of controversy for centuries. Governments have the power, through taxation, to redistribute income from one group to another, from one region to another. They have often used this power to favor urban dwellers over farmers, though in developed countries the pattern has recently been reversed. These redistributive objectives (which often seem only by coincidence to have much to do with egalitarianism) are pursued quite independently of their allocative effects. It is precisely

these “distortionary” consequences of government intervention that have incurred the economists’ wrath. Though it is true that the redistributive objectives might not be obtainable in a nondistortionary form, that does not detract from the central questions: how much redistribution, at what cost, and to whose benefit?³⁵

No policy is ever perfect. Even if it were perfectly adapted to the circumstances that prompted it, circumstances change—and then there may be alternative policies that are more effective. The question of how to handle policy changes has recently been the subject of debate.

Policy Reform

Should, for instance, the government make many small changes or a few large changes? The first option (sometimes referred to as policy “reforms”) has the advantage that it requires only knowledge of demand and supply elasticities and cross elasticities (or other variables) in the current equilibrium. Deciding what large changes are desirable requires a wider knowledge of the structure of the economy—information that is seldom available (indeed, there is some question whether, without experiments, such information is obtainable at all).³⁶ Nonetheless, there are significant (fixed) costs involved in making any change in policy, plus the costs of uncertainty whenever policy is changed frequently.³⁷ There may also be significant distributive consequences from policy changes that may, at best, be capricious; for example, changes in the relative taxes of different agricultural goods will change relative land values; these taxes may be borne mainly by those who happen to own the land at the time the tax is announced.

Of course, the most significant transactional costs are the set-up costs involved in a particular tax or subsidy. Though simple models that ignore these costs might suggest that it is desirable to have, say, a small tax or subsidy on fertilizer, the administrative costs of setting up such a scheme may be largely independent of the size of the tax or subsidy; when these costs are taken into account, they show that a tax or subsidy should be applied only if it is large. Many of the major policy issues cannot really be considered within a framework that is limited to marginal changes in tax rates.

This article has stressed that the design of agricultural policies should be viewed as an exercise in the theory of second best, an exercise requiring detailed information about a country and careful judgment about the nature and relative importance of market (and nonmarket) failures.

Concluding Remarks

Against these standards, most of the simplistic prescriptions fail.

The assertion that governments should never intervene in agricultural markets misses the potential importance, in some cases, of market failures. Arguments against distortionary trade taxes often fail to recognize that revenue has to be raised somehow; that many governments do not have any nondistortionary methods of raising revenue; and that trade taxes may have distinct transactional merits. These points apply even against more recent arguments that the government should not impose trade taxes (Diamond and Mirrlees 1971).

Simple prescriptions have one obvious advantage: they enable economists to make policy judgments with virtually no knowledge of the country in question. But the flaws in the simplistic approach make it all the more important to accumulate detailed information on most of the developing world. The first step in any systematic analysis of agriculture policies is therefore to describe as accurately as possible the consequences of each policy. This requires a model of the economy concerned—and a model appropriate for one country may not be for another. Recent work has clarified some of the essential ingredients of these models: wage-setting policies in the urban sector, the nature of rural-urban migration, and the organization of the rural sector—labor, land, and credit markets. This descriptive and empirical work is essential before it is possible to make useful normative judgments that attach welfare weights to the effects of policies on various groups.³⁸ Much of the recent work in optimal tax theory can be criticized on the grounds that it fails to make explicit the consequences of policy for various groups, providing only a summary description of the policy that maximizes some social welfare function.³⁹

The weakness of simple prescriptions should not drive people to the opposite extreme of arguing that, in a second-best world, “anything is possible.” Important *qualitative* statements can be made on the basis of certain *qualitative* information about the economy. This article has given one example of this tenet in developing countries: the simultaneous imposition of input subsidies and output taxes can be shown to be undesirable under certain conditions.

In any analysis of agricultural policies, the hardest part is to incorporate political economy considerations—to decide what are to be taken as political constraints. Again, though general answers may be impossible, some assumptions seem more reasonable than others. Thus, many analyses begin with the presumption that the government cannot lower the urban wage, but they also assume that the wage will not adjust in response to price increases. They assume, in other words, a kind of myopia, which may be valid in the short run, but seems implausible in the long run. It suggests more naiveté on the part of the economic theorist than is possessed by workers in developing countries.

Economists are also concerned about how their advice will be used.

There is a large gap between the rationale for certain policies and their actual consequences; policies that are justified as redistributive, though they do indeed redistribute income, may do so in a regressive manner. This article has expressed particular doubts about policies involving differential taxation, which hide official subsidies and give the government discretion in the way they are allocated. The validity of these doubts may differ from country to country. But they matter less to the extent that economists concentrate on a positive description of the consequences of alternative policies.

In virtually every country, governments intervene in agricultural markets in a variety of ways—with subsidies and taxes, with credit, with price stabilization programs, and with expenditure programs. This article provides a systematic framework within which these various programs can be assessed. The analysis of any policy must begin with a description of its effects. An evaluation of the appropriateness of any policy must begin by specifying the reasons for market failure and the instruments at the disposal of the government. The article focuses on the consequences of imperfect risk and credit markets and considers the incentive and distributive effects of alternative government programs.

Abstract

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1. See, for instance, Binswanger and Scandizzo (1983).
 2. This article is not a systematic review of the relevant literature; rather, its objective is to develop a perspective within which to view government policies toward agriculture. Bibliographical references have, accordingly, been kept to a minimum. This article elaborates on another recent survey (Johnson 1986). Johnson argues that "governmental intervention in agricultural markets should occur only when there is a strong affirmative case for so doing" (p. 15). The present article considers the conditions under which this will be true and the consequences of alternative policies under those circumstances.
 3. The following list of market failures is neither exhaustive nor mutually exclusive. For instance, as noted below, problems of imperfect information provide part of the explanation for incomplete risk and credit markets.
 4. Insurance markets are notoriously bad in many contexts other than agricultural markets. Particular problems in agricultural markets are adverse selection and moral hazard: the farmer is likely to be better informed about the hazards he faces than the insurer (this is referred to as the adverse selection problem); and there are actions the farmer can take that affect output (or, more generally, the insurance companies' expected liability; this is referred to as the moral hazard problem). Thus, though the farmer cannot affect whether there is a hailstorm, he can affect the losses he incurs if one happens, by taking precautionary action. Adverse selection and moral hazard problems need to be taken into account in the design of insurance contracts.
Government policies that ignore adverse selection and moral hazard may exacerbate the problems. Thus, government stabilization programs may induce farmers to increase their production of risky crops, thus imposing a greater cost on government than it would otherwise have to face.
 5. Most economists, believing in consumer sovereignty and individualistic social welfare functions, are more concerned about their low income than a low consumption of particular commodities, such as food or health services. There is, however, no unanimity on this point. Tobin (1970) for instance, has put forward the notion of "specific equalitarianism," arguing that society should be concerned with the levels of consumption of particular commodities.

Notes

6. What often seems of concern is not only the level of income but changes in income. If, for example, technological change makes many small farms economically unviable, government policies may be aimed at easing the transition of these small farmers out of agriculture. These programs may be thought of as a response to the market's failure to provide insurance against such changes.

7. A pure insurance or price stabilization program would, of course, just break even, with losses when prices are low offset by profits when prices are high.

8. See Braverman and Guasch (1986) for a review of the empirical findings on the impact of rural credit programs.

9. Indeed, the problems associated with distinguishing between good and bad borrowers and of monitoring the actions of borrowers enhance the scope for political abuse within subsidized credit schemes.

10. Most developing countries do not have the administrative wherewithal for an effective and equitable income tax system. Moreover, in economies in which private bookkeeping procedures are limited, the marginal social cost for implementing an income tax system may be unduly high.

11. Economists naturally feel (and should feel) less confident about statements concerning how their advice might be used or abused. Some economists claim that their responsibility is limited to explaining what taxes attain what distributive goals most efficiently. But political processes are no less real than economic processes, even if they are less understood. The question can be put in a more analytical way. Assume we believed that the political process was well described by a majority voting model. Because the future is uncertain, it is obviously undesirable to specify precise tax rates. Economists are asked whether there should be a constitutional restriction to uniform taxation of commodities. An economist brought up on the Ramsey rules might be tempted to say no. But an economist brought up in the social choice tradition would ask, if we have majority voting, what kinds of differential tax rates are likely to be imposed? Under some circumstances, that economist might conclude that expected social welfare would be higher, given the political process, under a constitutional restriction to uniform taxation.

12. All modeling requires simplification. Thus, the fact that a model leaves out certain aspects of reality is not in itself a criticism. It is, of course, essential that what is left out is of secondary importance. Many of the debates about the appropriateness of different theories turn on disagreements about the significance of some feature of the economy, which has been omitted from one model but plays an important role in another.

13. For a more extensive discussion of the issues associated with risk in the context of developing countries, see Newbery and Stiglitz (1981).

14. With futures markets, farmers must decide (usually before the size of their crop is known) how much of their crop to sell forward; if their crop exceeds the amount sold forward, they bear a price risk on the difference. With price stabilization schemes, the price is stabilized on all of their output, regardless of its size.

15. Perhaps this is so because of the large transactions costs in these markets or because small farmers may feel that they are at an informational disadvantage relative to speculators or large trading companies (it is well known that markets with such asymmetric information are likely to be thin or nonexistent; see Akerlof 1970). They may also be concerned that such markets may be subjected to manipulation.

16. When, for instance, the price approaches its floor, speculators believe that the government will probably not be able to sustain the price, so they sell their stocks, making it indeed impossible for the government to maintain the floor (Salant 1979).

17. These calculations suggest that the value of social welfare is sensitive to the precise stabilization rule employed. This should be contrasted with calculations on, for instance, the optimal tax rate, where, under a variety of circumstances, it appears that the value of social welfare is not very sensitive to the tax rates imposed.

18. In many developing countries, agricultural marketing boards, which are often justified in terms of their role in stabilizing prices, at the same time serve to tax agriculture.

19. It may not be obvious that industrial tariffs should really be viewed as a tax on agriculture. In a general equilibrium model, all that is relevant is relative prices. Increasing the price of industrial goods has the same effect as reducing the price of agricultural goods. This fact is, of course, eventually discovered by farmers and has been a source of strife in developed countries.

20. Even if supply curves do bend backward, with income effects and substitution effects offsetting each other, there are dead weight welfare losses.

21. Though the more theoretical work on sharecropping suggests that the shares ought to respond to these changes in circumstances, there is little evidence that they do so, perhaps for the reasons suggested by Allen (1985). It is important to note that the sharecropping system is not necessarily inefficient; that it may represent a reasonable response to the problems of incentives and risk in farming. (See Cheung 1969; Stiglitz 1974.) Nonetheless, with a positive labor supply elasticity, output under sharecropping may be much less than it would be after a land reform, in which land was redistributed to the peasants.

22. See Sah and Stiglitz (1985). These conditions entail large cross elasticities of demand, significant nonhomotheticity in the production function, and significant general equilibrium wage effects. Their analysis does not, however, apply to sharecropping.

23. This is a heuristic argument. The general theory of the second best has emphasized the inappropriateness of counting distortions. Diamond and Mirrlees (1971) have established a general theorem concerning the desirability of production efficiency. Though Dasgupta and Stiglitz (1971) have noted several important limitations to that theorem (in particular, the theorem requires that the government have a rich set of instruments at its disposal), it still seems that, in the case examined here, there is a presumption in favor of production efficiency.

24. Cross elasticities between the outputs of different crops must also be taken into account. The importance of these cross elasticities depends on how fine will be the differentiation among commodities. That is, the cross elasticity between two types of wheat is likely to be much greater than the cross elasticity between wheat and rice. Johnson (1986) has suggested that the differential taxes imposed on wheat relative to rice—which is significant in both China and India—may have more to do with the greater political influence of wheat farmers than rice farmers.

25. In some cases, reducing the price received by farmers might reduce migration. If farmers are credit constrained, then when they are worse off they may be less able to finance extended unemployment in urban areas. See Kanbur (1981).

26. For two recent surveys of the issues involved in rural credit, see Braverman and Guasch (1986) and Lipton (1981).

27. That is, they are not Pareto efficient, even taking into account the limitations in information; there exist government policies that could, in principle, make everyone better off.

28. Even the private sector has difficulty designing managerial incentive schemes to assess these risks. Whether a particular loan is “good” or not will often not be apparent for several years, after the loan officer has departed for another job.

29. Braverman and Guasch (1986) cite several such instances, including the INVIERNO Development Bank Program, implemented in Nicaragua in 1975, programs in Korea (see also Lee and others 1977), and Kenya’s Cooperative Savings Scheme (von Pischke 1983).

30. In certain limiting cases, it can be shown that if there is an optimal (or Pareto efficient) tax structure, then no commodity taxes should be imposed. Even with an optimal linear tax, the presumption against commodity taxation remains fairly strong. More generally, the properties of the demand systems that determine whether commod-

ity taxes should be imposed and, if so, at what rates are at best hard to estimate. Thus, for instance, with the frequently estimated linear expenditure system, it is always the case with an optimal linear income tax that no commodity taxation should be imposed, if the only source of inequality is differences in individuals' wages (including differences in wealth that result from these wage differences).

More generally, while the distortions arising from taxing commodities that are inelastically demanded may be small, those commodities generally have low income elasticities, so that taxing them has regressive distributional consequences. In many cases, once an optimal income tax is imposed, these distributional and incentive effects exactly balance each other, making it desirable to impose no commodity taxation at all.

31. Subsidy schemes in which the size of the subsidy depends on the income of the farmer may be used in some circumstances. The simplest schemes enable each farmer to buy a given amount of fertilizer at a subsidized price. For all farmers who buy more than that amount, the subsidy is equivalent to a lump sum subsidy (and in this sense, has nothing to do with fertilizer). If black markets cannot be prevented, even those who use less than the given amount will purchase the subsidized fertilizer for resale. Then the fertilizer subsidy does nothing more than provide a uniform lump sum for all individuals.

32. The cost differences associated with rental versus ownership markets may reflect important moral hazard problems. The fact that these differences are not a consequence of a "market failure" does not lessen the distributional consequences. A similar point applies to the different costs of capital facing different farmers.

In some cases, incentive and distributional considerations pull in opposite directions; in others, they reinforce each other. Assume, for instance, that because of lack of access to the capital market, poor farmers use less fertilizer. A fertilizer tax would then have a beneficial distributive effect. But, at the same time, the marginal product of fertilizer is much higher among the poor than among the rich. A fertilizer subsidy would partly offset the inefficiencies arising from the poor's lack of access to capital. In this case, although the poor consume less fertilizer, the increment in income resulting from a fertilizer subsidy may be larger.

33. Moreover, to the extent that there are fixed costs associated with acquiring information needed to implement a new technology, large farmers have a greater incentive to make the requisite expenditures. To the extent that these costs are borne by the government (through agricultural extension services), these effects are mitigated.

34. See Braverman and Kanbur (1986) for a model examining these questions in an African context.

35. Perhaps the question that should be posed is not, What is the optimal set of taxes and subsidies? Rather, the question is, Given the political processes that determine which taxes or subsidies will be chosen, what constraints should be imposed on the set of admissible taxes or subsidies? Some contend that the answer to this question, in many contexts, involves uniform taxation.

36. At issue is not the lack of econometric research or the unavailability of data. The economy may simply not have experienced, say, relative prices in the range in which some policy might take it. Though economists frequently assume constant elasticity functions, allowing them to project the consequences, this is little more than guess work; even if elasticities were approximately constant over the range of relative prices that have been experienced, there is no reason to believe that the elasticity would remain constant outside that range.

37. Although again, it is not apparent whether there is more effective uncertainty associated with a large number of small changes or infrequent large changes in policy.

38. Braverman and Hammer have emphasized in their work the importance of a careful positive description of the consequences of policy, incorporating the constraints and distortions within the country. See, for instance, Braverman and Hammer (1986); Braverman, Hammer, and Ayn (1986); and Braverman, Hammer, and Gron (1986).

39. More recent work on Pareto efficient tax structures attempts to identify the characteristics of the tax structures that apply regardless of the normative judgments employed. For a review of this work, see Stiglitz (1987).

References

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- Akerlof, George. 1970. "The Market for 'Lemons': Qualitative Uncertainty and the Market Mechanism." *Quarterly Journal of Economics* 84: 488–500.
- Allen, Franklin. 1985. "On the Fixed Nature of Sharecropping Contracts." *Economic Journal* (March): 30–48.
- Atkinson, A. B., and Joseph E. Stiglitz. 1980. *Lectures on Public Economics*. New York: McGraw-Hill.
- Binswanger, Hans P., and Pasquale L. Scandizzo. 1983. *Patterns of Agricultural Protection*. Agriculture Research Unit Discussion Paper 15. Washington, D.C.: World Bank, Agriculture and Rural Development Department.
- Braverman, Avishay, and Luis Guasch. 1986. "Rural Credit Markets and Institutions in Developing Countries: Lessons for Policy Analysis from Practice and Modern Theory." *World Development*. Forthcoming.
- Braverman, Avishay, and Ravi Kanbur. 1986. *Urban Bias and the Political Economy of Agricultural Price Reform*. AGREP Working Paper 117. Washington, D.C.: World Bank, Agriculture and Rural Development Department.
- Braverman, Avishay, and Jeffrey S. Hammer. 1986. "Multimarket Analysis of Agricultural Pricing Policies in Senegal." In Inderjit Singh and others, eds. *Agricultural Household Models: Extensions, Applications, and Policy*. Baltimore, Md.: Johns Hopkins University Press.
- Braverman, Avishay, Jeffrey S. Hammer, and C. Y. Ayn. 1986. "Multimarket Analysis of Agricultural Pricing Policies in Korea." In David Newbery and Nicholas Stern, eds. *The Theory of Taxation in Developing Countries*. New York: Oxford University Press. Forthcoming.
- Braverman, Avishay, Jeffrey S. Hammer, and Anne Gron. 1986. "Multi-Market Analysis of Agricultural Price Policies in an Operational Context: The Case of Cyprus." *World Bank Economic Review*. Forthcoming.
- Braverman, Avishay, and Joseph E. Stiglitz. 1986. "Cost Sharing Arrangements under Sharecropping: Moral Hazard, Incentive Flexibility, and Risk." *Journal of the American Agricultural Association*. Forthcoming.
- Cheung, S. N. 1969. *The Theory of Share Tenancy*. Chicago: University of Chicago Press.
- Dasgupta, Partha, and Joseph E. Stiglitz. 1971. "Differential Taxation, Public Goods, and Economic Efficiency." *Review of Economic Studies* 38: 151–74.
- Diamond, Peter, and James Mirrlees. 1971. "Optimal Taxation and Public Production I: Production Efficiency." *American Economic Review* 61: 8–27.
- Johnson, D. Gale. 1986. "Policy Issues in Rainfed Agriculture." Paper presented at the World Bank's Sixth Agricultural Symposium, Washington, D.C., January 10.
- Kanbur, Ravi. 1981. "Short-Run Growth Effects in a Model of Costly Migration with Borrowing Constraints: Will Rural Development Work?" In D. Currie and others, eds. *Essays in Microeconomics and Economic Development*. London: Croom Helm.
- Lee, D. H., and others. 1977. "Savings Deposits and Agricultural Cooperation in Korea." *Asian Survey* 17: 1182–94.
- Lipton, Michael. 1971. *Why Poor People Stay Poor: A Study in Urban Bias in World Development*. London: Temple Smith.
- _____. 1981. "Agricultural Finance and Rural Credit in Poor Countries." In Paul

- Streeten and Richard Jolly, eds. *Recent Issues in World Development: A Collection of Survey Articles*. Elmsford, N.Y.: Pergamon.
- Newbery, David N., and Joseph E. Stiglitz. 1981. *The Theory of Commodity Price Stabilization*. London: Oxford University Press.
- _____. 1982. "Optimal Stockpiling Rules." *Oxford Economic Papers* 34, no. 3 (November): 403-27.
- Sah, Raaj, and Joseph E. Stiglitz. 1985. *Taxation and Pricing of Agricultural and Industrial Goods in Developing Countries*. Economic Growth Center Discussion Paper 475. New Haven, Conn.: Yale University.
- Salant, Stephen. 1979. "The Vulnerability of Price Stabilization Programs to Speculative Attack." *Journal of Public Economics* 91, no. 1 (February): 1-38.
- Stiglitz, Joseph E. 1974. "Incentives and Risk Sharing in Sharecropping." *Review of Economic Studies* (April): 219-55.
- _____. 1986. *The Economics of the Public Sector*. New York: Norton.
- _____. 1987. "Pareto Efficient and Optimal Taxation and the New New Welfare Economics." In Alan Auerbach and Martin Feldstein, eds. *Handbook on Public Economics*, vol. 2. Amsterdam: North-Holland. Forthcoming
- Tobin, James. 1970. "On Limiting the Domain of Inequality." *Journal of Law and Economics* 13: 262-77.
- von Pischke, J. D. 1983. "A Penny Saved: Kenya's Cooperative Savings Scheme." In J. D. von Pischke and others, eds. *Rural Financial Markets in Developing Countries*. Baltimore, Md.: Johns Hopkins University Press.

MACROECONOMIC POLICY AND TRADE LIBERALIZATION: SOME GUIDELINES

Michael Mussa

Trade liberalization seeks to reform a country's international commercial policies in order to improve economic welfare by achieving a better allocation of resources in the long term. In contrast, macroeconomic policy is concerned with shorter-term management of the whole economy, especially aggregate output and employment, the price level, and the balance of payments. Despite these fundamental differences, successful trade liberalization is linked to the conduct of macroeconomic policy. In particular, problems resulting from poor macroeconomic policies may cause liberalization to be perceived as a failure, prompting a return to the protectionist policies that injure economic welfare in the longer run.

This paper examines the interaction between trade liberalization and macroeconomic policies. It describes the policy environment of a country opting for liberalization, which has many of the characteristics of developing countries with highly protective trade policies. Liberalization is assumed to reduce the general level of protection and to narrow the range of protection rates among different activities. In the long run, these policies are assumed to achieve a shift of resources toward exports and away from import substitutes. This long-run adjustment, however, cannot be achieved without some shorter-run difficulties that may be ameliorated or exacerbated by macroeconomic policies.

The first macro issue to be considered is the exchange rate. At a constant nominal rate, a country adjusting to a major trade liberalization needs to reduce its domestic prices. Alternatively—and often more appropriately—it may choose to devalue the exchange rate suf-

ficiently to offset the effects of trade liberalization on the general level of domestic prices.

Fiscal and monetary policies are then discussed. Most developing countries maintain some form of pegged exchange rate, which imposes serious constraints on monetary policy, and they frequently rely on the domestic banking system to finance budget deficits. This strategy leaves the government little latitude for conducting monetary policy independently of exchange rate and fiscal policies. As for fiscal policy, the critical task is to control the government deficit. This task can be made more difficult by three possible results of trade liberalization: a decline in revenues from tariffs and export taxes; a decline in revenues from import-competing enterprises (and larger deficits of public enterprises); and an increase in financial assistance to exporters and as a cushion for firms affected by competitive imports.

Wage policy is also discussed, particularly the need to reduce real wage rates in some sectors of the economy in conjunction with a trade liberalization. Avoiding a fall in the general price level, and perhaps allowing some increase, may make a desirable contribution to this goal. Also, the government can set a good example by insisting on appropriate cuts in real wages for government employees and by preventing public enterprises from running large deficits to avoid or delay the necessary cuts.

In regard to credit policy, the government needs to ensure an adequate supply of credit to finance the expansion of exporters. A key requirement is that the government does not allow its own deficit to crowd out private investment. It should also ensure that the financial problems of firms previously benefiting from protection do not jeopardize the financial system. If private borrowers have direct or indirect access to international credit markets, it may also be appropriate to limit destabilizing surges of foreign borrowing.

In all these areas, success depends on the government's establishing and maintaining a credible commitment to a liberal trade policy and to macroeconomic policies consistent with this reform. If this commitment is in doubt, it will discourage movements of resources out of import-competing activities and into the expansion of exports. Because political pressure from those injured by a sudden removal of protection might stop or reverse liberalization, a government may want to liberalize gradually. If it moves too gradually, however, it creates doubts about its seriousness and encourages the political forces opposing liberalization. The right policy is likely to be the one that recognizes that previously protected groups are going to lose but seeks to moderate their losses. The other requirement for a credible policy of liberalization is to avoid a severe deterioration of the balance of payments, because that might induce the reintroduction of protectionist policies.

For analytical purposes, it might be supposed that the economy liberalizing its trade falls into one of two camps. At one extreme, take the example of a country with little market power in world trade, where resources move costlessly and instantaneously among alternative uses in response to the signals provided by relative commodity and factor prices; all markets clear, so all resources are fully employed; and there are no distortions of the economic system that significantly diminish the benefits of trade liberalization. On such extreme assumptions, there is little to be said about the macroeconomic policies that should be adopted in conjunction with trade liberalization. Exchange rate and monetary policies would influence nominal prices and the central bank's reserves of foreign exchange but would not affect relative prices or any of the real consequences of trade liberalization.¹ Fiscal policy might affect the division of economic activity between the public and private sectors but would not have any significant connection with trade liberalization, aside from the need to replace government revenues previously derived from restrictive trade policies. The same can be said for other categories of macroeconomic policy.

At the other extreme, a country might have permanent rigidities of nominal and relative prices of commodities and factors, and the allocation of its real and financial resources might be highly inflexible because of binding political or other noneconomic considerations. In this example, too, there is little to be said about the macroeconomic policies accompanying trade liberalization. If the economic system is so inflexible that it cannot achieve any reallocation of resources, except at great cost, then trade liberalization itself may not be desirable. Rather than attempting any macroeconomic reform, a country would do better to try to eliminate or reduce microeconomic rigidities.

This article does not adopt either of these extreme models. Rather, it assumes an environment similar to that which might be found in developing countries contemplating a major trade liberalization. The country is assumed to start out with a high level of protection for its import-competing industries (especially in manufacturing) and to plan a large reduction in protection over a few years. Specifically, the average nominal level of protection for import-competing activities is assumed to be 50 percent, declining to 10 percent. Some exports may initially benefit from incentives that partially offset the protection given to import-competing industries. As trade is liberalized, incentives to particular exporters are reduced along with reductions in explicit and implicit export taxes. Specifically, the average equivalent tax on exports relative to imports is assumed to fall from 60 percent to 10 percent—made up of a reduction in the average equivalent nominal tariff rate from 50 percent to 10 percent and a

reduction in the average equivalent export tax rate from 10 percent to zero.

In the long term, the major effect of this trade liberalization should be an expansion of exports, both traditional and nontraditional, at the expense of import-competing activities. Among import-competing activities, resources should shift away from those with previously high effective rates of protection toward those with previously low or negative rates of protection. There may also be a net shift of resources between the tradable and nontradable goods sectors, since greater efficiency in the tradable goods sector allows its output to expand without any increase in the total resources employed. This increased output of tradable goods may or may not exceed the increase in domestic demand for such goods that would normally be the result of trade liberalization.

Costs and delays in moving resources to alternative uses are assumed to prevent the economy from responding immediately to the incentives of a liberalized trade policy, even in the absence of stickiness in the adjustment of commodity and factor prices. Costs and delays are also encountered in expanding many exports that cannot be sold at a given price, in unlimited quantities, on world markets. Also, some temporary stickiness is assumed to affect nominal and real wages.

The country adopting the trade liberalization is assumed to maintain a fixed exchange rate and to pursue monetary and credit policies consistent with its exchange rate policy and with the maintenance of balance of payments equilibrium. Fiscal policy is assumed to be consistent with exchange rate and monetary policies and with the requirements of balance of payments equilibrium before the trade liberalization. For these conditions to be satisfied, the general level of domestic prices, adjusted for the nominal exchange rate and for existing commercial policies, must bear the appropriate relationship to world prices, and the supply of domestic credit must not be expanded more rapidly than the growth of demand for domestic money (at the pegged nominal exchange rate) in order to finance budget deficits or for other purposes. Furthermore, government borrowing from abroad must not exceed the amount that the government could reasonably be expected to repay by securing command over future export revenues.

In many developing countries, these assumptions may not be satisfied, so this article will also consider the implications of alternative assumptions. It will show that some combinations of exchange rate, monetary, and fiscal policies are consistent with the success of trade liberalization; others create difficulties of their own and interfere with the possible success of trade liberalization.

Other assumptions include reasonable credibility in the government's trade and macroeconomic policies. Private agents, of course, recognize the possibility that the liberalization policy may be reversed

but do not believe that such a reversal is likely unless the policy shows serious adverse consequences. Similarly, private agents may doubt the government's capacity to maintain the nominal exchange rate, but these doubts are assumed to become serious only when there is concrete evidence of developments that will force the government to change its plans.

Conditions in the rest of the world can have considerable influence on the success or failure of a country's reforms. Liberalization is more likely to succeed when the world economy is growing rapidly than during a recession. Proper macroeconomic management also tends to be easier during periods of rapid growth. Unfortunately, these observations do not provide any real clues as to the specific time to liberalize. Moreover, since freer trade is a long-term policy with long-term benefits, it is most convenient to consider it being introduced when world economic conditions are broadly neutral.

The nominal exchange rate, together with commercial policies (tariffs, quotas, export taxes, and the like), has a major influence on local-currency prices of imported goods and domestic goods that compete closely with them. At a given nominal exchange rate, the major trade liberalization described earlier would induce (a) a reduction of about 40 percent in the local-currency prices of imports (corresponding to the 40 percent cut in the average equivalent nominal tariff rate) and (b) an increase of about 10 percent in the local-currency prices of exports (corresponding to the 10 percent cut in the average equivalent export tax rate).² The local-currency prices of import substitutes would presumably need to fall by roughly the same amount as the prices of imports. Under reasonable assumptions about demand and supply elasticities, the local-currency prices of nontraded goods would also need to fall significantly, though less than those of import substitutes. If all these factors are taken into account, the general level of domestic prices would need to decline by 15 to 30 percent to reach its new equilibrium.³

If the local-currency prices and wages were perfectly flexible, adjusting immediately to maintain full employment of all resources, then the only reason to adjust the nominal exchange rate in conjunction with a major trade liberalization would be to avoid losing foreign exchange reserves. According to the monetary approach to the balance of payments, this loss of foreign reserves would otherwise occur because, at a constant nominal exchange rate, the long-run equilibrium level of demand for domestic money declines as a result of the fall in the long-run equilibrium of domestic prices.⁴ (The decline in long-run money demand may be slightly smaller than the fall in domestic prices because trade liberalization induces some growth in

***Exchange Rate
Policy for
Countries with
Low Inflation***

real domestic output and hence in the real demand for domestic money.) With a constant supply of domestic credit, this decline in money demand would require a corresponding loss of foreign exchange reserves. To avoid this, it is necessary to devalue the nominal exchange rate by enough to maintain long-run money demand at its level before the trade liberalization. The devaluation should normally be a little less than the fall in domestic prices that would result without a devaluation. With the exchange rate falling, trade liberalization would then reduce only slightly the general level of domestic prices, but would still require large cuts in the local-currency prices of imports and import substitutes.⁵

Avoiding a loss of foreign reserves is not the only reason for considering devaluation in conjunction with trade liberalization. For economies in which prices and wages are not perfectly flexible, it can be argued that the minimum appropriate devaluation is one that would avoid a decline in the long-run equilibrium level of domestic prices. This in turn would avoid the need for unemployment of resources in most sectors of the economy in order to achieve a general decline in product and factor prices. However, prices and wages in import-competing sectors would still need to fall; a devaluation of 15 to 25 percent would not compensate them for a 40 percent cut in the average equivalent nominal tariff rate.

That conclusion does not mean that it would be right to devalue by the full 40 percent, so as to shield import-competing activities. They had previously been highly protected; resources need to be moved out of them; and economic incentives are needed to encourage such movement. A large devaluation would simply generate a massive increase in the general price level, and even that would not nullify the effects on import-competing sectors. After all, money illusion is not unlimited. People cannot be fooled into accepting without a whimper big cuts in real wages and profits when these are brought about by a general price rise, if they would strongly resist similar cuts brought about by a decline in nominal wages and profits. Indeed, a big devaluation that attempts to shield import-competing activities from trade liberalization can easily be self-defeating, if it makes all sectors try to protect their real incomes from the effects of general price inflation.

For a country with a reasonable record of exchange rate and price stability, the best exchange rate policy to accompany a major trade liberalization is likely to be a modest devaluation that can plausibly be represented as "an adjustment of the exchange rate to avoid the deflationary consequences of trade liberalization." Theoretically, the need for such a devaluation is clear; it could also be made apparent to the general public.⁶

The timing of the devaluation also needs to be considered in conjunction with the phasing of the trade liberalization. If trade is liberal-

ized all at once, then it probably makes sense to devalue at the same time. If the liberalization is phased in over three or four years, then it may be desirable (for a country with a history of exchange rate and price stability) to devalue the exchange rate once, at an early stage of the liberalization process. The right moment is probably the first big reduction in import tariffs (or tariff equivalents), rather than the time of a switch from quotas to tariffs, and the devaluation should be slightly smaller than the cut in tariffs.⁷ This would put relatively little initial pressure on the nominal prices of import substitutes, but the knowledge that further tariff reductions would follow would encourage people to switch resources out of import-competing activities. In addition, by concentrating all the exchange rate devaluation into this stage of the liberalization, exporters are given some extra (if temporary) incentives—these incentives should help to promote the switch of resources.

Policy prescriptions are harder for a country that has had rapid inflation and a large exchange rate depreciation. People are likely to see a faster devaluation as the precursor of faster inflation, even though this need not be true when a major trade liberalization is being implemented. Hence, a devaluation intended to neutralize the deflationary effects of trade liberalization is likely to have some inflationary effect as workers and capitalists try to protect real wages and real profit margins from the general inflation they expect.

To deal with this difficulty, a larger-than-average depreciation may sometimes be appropriate for a country with a history of rapid inflation and exchange rate depreciation. The evidence suggests that even in highly inflationary countries, a big devaluation of the nominal exchange rate tends to produce a temporary reduction in the real rate.⁸ In other words, a big devaluation tends to raise the domestic price of internationally traded goods relative to the general level of domestic prices. However, a devaluation large enough to have a significant effect of this kind in the short run is likely to contribute considerably to domestic inflation through a substantial once-and-for-all increase in the equilibrium level of domestic prices and perhaps also through subsequent price increases due to the effects of indexing. Since many high-inflation countries attempting trade liberalization may also be trying to curb inflation, this is a serious drawback.

Is it therefore sensible for a government to try simultaneously to liberalize trade and to reduce inflation? The initial stages of a trade liberalization are likely to squeeze the import-competing sectors, and perhaps even the economy as a whole, unless the exchange rate is devalued. However, a devaluation is likely to hamper or frustrate anti-inflation policies. A serious anti-inflation policy is also likely to

***Exchange Rate
Policy for
Countries with
High Inflation***

squeeze the whole economy, placing strain on a country's economic and political fabric. If the strains are too great, trade liberalization and anti-inflation policies may both be reversed, and the whole exercise abandoned.

If the potential benefits of trade liberalization are large relative to the costs of inflation, it may make sense to pursue the liberalization first. For a country that pegs its nominal exchange rate between devaluations, it will then often be desirable to combine the first major reduction in protection with a devaluation. A lower exchange rate would offset some of the deflationary consequences of tariff cuts and give some extra incentives to exporters. The devaluation should probably be larger for a high-inflation country, where domestic and international prices are usually most out of line. Furthermore, the benefits of devaluation are likely to be eroded more rapidly in a high-inflation country. Later, as tariffs are reduced further, more devaluations may be desirable. However, governments need to be careful to limit the speculative movements in capital and trade that would occur if devaluations were widely anticipated.

For a high-inflation country with a crawling peg exchange rate, it will often be appropriate to combine the first big reduction in protection with a maxi-devaluation designed to avoid the deflationary consequences of trade liberalization. If subsequent reductions in protection are made in small steps, they might be timed to occur with normal devaluations of the nominal exchange rate. However, maxi-devaluations that coincide with later measures to liberalize trade on a big scale undermine the principal advantage of a crawling peg system for a high-inflation country.⁹ A crawling peg allows a country with rapid inflation (relative to the rest of the world) to devalue its nominal exchange rate smoothly, without the disruptions that go with occasional big devaluations or with exchange rates that remain overvalued for long periods. Under a crawling peg, occasional maxi-devaluations may be necessary to correct major price misalignments. However, it is desirable to keep such maxi-devaluations to a minimum; hence, they may not make sense as a regular and predictable element in trade liberalization.

If a government decides to pursue an anti-inflation program before liberalizing its trade, it can still implement those liberalizing measures that assist its anti-inflation goals. These measures include cuts in tariffs that are redundant or provide very high levels of protection, as well as shifts from import quotas to tariffs. Reducing protection for the most protected activities is desirable because it allows the squeeze of an anti-inflation program to be concentrated on those sectors that have the highest domestic resource cost relative to social value added. A government can also boost its revenues by cutting tariffs to levels that allow imports to increase to revenue-maximizing levels. Since the

rents associated with quotas are rarely captured by governments, the shift from quota to tariff also increases government revenue. These extra revenues can make a useful contribution to the anti-inflation program by helping to alleviate one of the main causes of inflation in many countries—the government's need to create money to finance its budgetary deficit.

Fiscal and Monetary Policies

In many industrial countries, there is no essential link between fiscal and monetary policies or between them and commercial policies (tariffs, import quotas, export incentives, and so forth). Governments can borrow to finance their deficits without automatic resort to the central bank. Revenue from tariffs is not an important source of government finance. In many developing countries, by contrast, monetary and fiscal policies are closely linked because opportunities for financing budget deficits other than from the central bank are limited. Also, taxes on trade are a considerable source of government finance.

The fiscal consequences of trade liberalization are diverse:

- Some measures normally taken during the early stages of trade liberalization help to boost government revenue and thereby reduce the need to create money to finance the budget deficit.
- In the later stages of trade liberalization, however, cuts in tariffs below revenue-maximizing levels and lower export taxes are likely to reduce government revenue by more than the reduction in spending on export incentives.
- Taxes collected from previously profitable firms in the import-competing sector are likely to decline and not be replaced immediately by taxes collected from newly profitable exporters.
- Losses of government enterprises in the import-competing sector will drain the budget, especially if there is prolonged resistance to reductions in real wages and payrolls in these enterprises.
- Adjustment assistance or benefits paid to distressed workers or firms in the import-competing sector are another possible drain on the budget.

As the positive effects of trade liberalization come through, however, these pressures on the government budget should diminish. In the longer run, liberalization should produce budgetary benefits, except for the direct loss of revenue from taxes on trade. A government whose fiscal position is initially strong may therefore be able to absorb the temporary fiscal strains of liberalization. Other governments may have difficulty. If they have access to commercial credit, one possibility would be to finance the social investment in trade liberalization by borrowing abroad. Another possibility would be to obtain “structural adjustment assistance” in the form of a loan from the

World Bank, the International Monetary Fund, or another official agency. A third option is to devalue.¹⁰

Because trade liberalization may squeeze economic activity in the short term, it might be argued that monetary and fiscal policies should become more expansionary to offset this effect. For monetary policy, this question is essentially the same as how much to devalue in conjunction with trade liberalization.¹¹ For fiscal policy, it is doubtful that general fiscal expansion is sensible to pursue in conjunction with trade liberalization. For many governments pursuing trade liberalization, the problem is to find ways to replace revenue lost from taxes on trade.

Wage Policy

A major trade liberalization normally requires adjustments in the equilibrium structure of real wages in different parts of the economy. The real wages of skilled workers in highly protected import-competing activities often need to decline. The real wages of skilled workers in export industries may rise as a consequence of trade liberalization. To the extent that workers can shift from contracting to expanding sectors of the economy (with little deterioration in the economic value of their skills), real wage adjustments will be moderated—though still not eliminated.¹²

Resistance to required wage adjustments tends to lead to higher unemployment and more business failures in sectors previously benefiting from high levels of protection. To the extent that such resistance is to cuts in nominal rather than real wages, this problem may be ameliorated by a devaluation that cuts real wages but not nominal ones. It is doubtful, however, that general price inflation can remove all of the difficulties involved in cutting real wages.

It is also doubtful that the government's wage policy can resolve all these difficulties. Governments in developing countries rarely have complete control over all wages. But they usually have direct influence on the wages of government workers, and some indirect influence on wages in public enterprises. Government regulations may prescribe minimum wage rates for public and private sector workers. Government policies may influence indexing arrangements for both public and private sector workers. These influences can be used to help minimize the transitional difficulties of liberalizing trade. For example, if the exchange rate is to be devalued, the government should use its influence on indexing arrangements to avoid wage increases in those sectors where real wages need to be cut.¹³ If workers in the private sector are to forgo the indexing that preserves their real wages, then workers in the public sector should do the same. Public enterprises in the import-competing sector should not be allowed to run large deficits in order to maintain the real wages of their workers. This not

only sets a bad example for the private sector, it also can defeat the government's efforts to control its budget deficit.

Wage subsidies are sometimes recommended as a policy to deal with high unemployment in particular sectors of the economy. In conjunction with a trade liberalization, such subsidies should be used very cautiously, if at all. The aim of trade liberalization is to shift resources into sectors where they have a higher social marginal product, and the pressure to do this is diminished if workers in previously protected sectors receive wage subsidies. Subsidies also worsen the government's fiscal position.

Governments of developing countries exert varying degrees of influence over the allocation of credit. In many countries, the public sector is the main demander of credit from the domestic banking system and often has a virtual monopoly on obtaining credit from abroad. The terms and conditions on which credit is available to private enterprises also are often strongly influenced by the government. How can credit policies be used to assist trade liberalization?

Credit Policy

Expansion of exports is usually a primary goal of trade liberalization. For such expansion to occur, exporters must increase their fixed investment and working capital. Private entrepreneurs may be able to finance part of this expansion, but they often need more credit as well. Governments should seek to ensure that adequate credit is available on terms and conditions that reflect the opportunity cost of capital and the risks of particular enterprises. An essential requirement for such a policy is that the government and public enterprises do not place excessive demands on the total supply of domestic credit.

As trade is liberalized, enterprises in previously protected sectors may run into financial difficulties. So long as these difficulties are not too severe and widespread, no general problem of economic policy need arise.¹⁴ The creditors of some previously profitable firms will simply need to write down some of their loans. If credit problems are acute, however, there may be a significant danger of a crisis in the financial system. This danger increases if financial institutions continue lending to effectively bankrupt enterprises in order to avoid writing off losses on their earlier loans. To guard against this danger, the pace of trade liberalization and the extent of devaluations should be controlled to limit the likelihood that credit difficulties will threaten the financial system. Government supervision of financial institutions should discourage unsound lending practices.

Special problems arise when credit is quantitatively allocated and provided at real interest rates well below the social opportunity cost of capital. This often happens in high-inflation countries, where interest rates for depositors and borrowers are fixed well below the

inflation rate. The savings needed to support a more liberal trade regime—for bigger exports and budget deficits—are discouraged by a high effective tax on savings. The allocation of resources among potential export activities is likely to be strongly influenced by bureaucratic decisions about who gets artificially cheap credit, rather than by considerations of economic efficiency and prospective profitability. The financial difficulties of firms that previously benefited from heavy protection and subsidized credit are likely to be especially severe when they are faced with less protection and a diversion of credit toward exporters.

There is no good way to avoid the difficulties caused by a distorted credit system, except by reforming that system. Depositors should be allowed a rate of return that encourages them to save. Borrowers should be required to pay real interest rates that reflect the social opportunity cost of capital and the riskiness of their business. The allocation of credit should depend on economic efficiency and profitability. Since the economy may have difficulty digesting simultaneously a financial reform and a trade liberalization, the governments may need to choose which reform to introduce first. The right choice is often to start with financial reform, because it usually makes sense to correct distortions in factor markets before implementing policies that will shift the allocation of resources.¹⁵

International borrowing is another area of concern when trade is being liberalized. When private companies cannot borrow abroad (as is the case for some developing countries), the prime concern is limiting official borrowing to a level that can be repaid out of future tax revenues and export surpluses. When private enterprises can borrow abroad (either directly or through domestic financial institutions), it may also be appropriate to control their borrowing in order to avoid a credit-financed import binge when trade restrictions are relaxed.¹⁶ The motivation for such a binge may come from accumulated demand for imports built up during a long period of import controls, from fears that the relaxation will be temporary, and from concern that such borrowing may be restricted or a devaluation effected if the balance of payments deteriorates badly during the course of liberalizing trade.

A surge of foreign borrowing can create serious problems for trade liberalization. It boosts domestic spending, putting upward pressure on the prices of nontradable goods in relation to tradable goods. While it lasts, this tends to shift resources toward the production of nontraded goods—to an extent that is not consistent with the long-run effects of trade liberalization.

Another problem sometimes associated with trade liberalization is a sharp rise in real interest rates. This has occurred particularly in countries that have rapid inflation and distorted financial markets and that liberalize trade at the same time as they try to reduce inflation

and liberalize their financial markets. Indeed, the very high real interest rates that have recently afflicted some developing countries are probably more related to cycles of inflation and disinflation and to financial policies than to trade liberalizations.

In a country with a history of rapid inflation, market-determined nominal interest rates are likely to reflect not just the government's current efforts to control inflation, but also past inflation and fears of a resurgence. For this reason, realized real interest rates (the difference between nominal interest rates and current inflation) can be high during a period when the government is bringing down inflation but markets remain doubtful of the longer-term success of anti-inflation policy. For borrowers, realized real rates are likely to be especially high relative to past experience if interest rates were previously held down by financial controls.

Whatever the cause, a sharp rise in real interest rates is a serious threat to the success of trade liberalization. High real interest rates discourage the expansion of export industries and worsen the problems of firms in previously protected sectors. They are also likely to aggravate the government's own fiscal position by increasing the real cost of its borrowing. Successful trade liberalization then needs to be more carefully coordinated with efforts to reduce inflation and improve the workings of credit markets.¹⁷

Some of the efforts to liberalize trade in developing countries ultimately fail. In some cases, returning to heavy protectionism may be due to a judgment that such a policy is in a country's long-run interest. In others, the political power of groups that benefit from protectionism may be so great that autarkic policies are dictated by the political equilibrium of a country. In many cases, however, failure of the liberalization effort may be due to problems encountered in the transition from protectionism to liberalism.¹⁸ These problems can be exacerbated by doubts about the government's willingness and ability to liberalize trade and its commitment to important related policies.

One obvious difficulty is that, if heavy protection is suddenly and unexpectedly removed from import-competing activities, capitalists and workers in these industries may suffer large losses. Slower and preannounced liberalizing will reduce these losses.¹⁹ So too will a policy that provides some incentive for increasing exports before applying a major squeeze on import-competing activities. However, no serious policy of freer trade can avoid causing some losses in hitherto protected activities. Policymakers should seek to control social losses and to keep private losses below the point where political pressures jeopardize the liberalization effort. In doing so, they should remember that excessive timidity can be as damaging as excessive aggressiveness.

*Policy
Credibility and
the Balance
of Payments*

If a government implicitly admits that it is unwilling to impose any significant losses, even on the most heavily protected industries, grave doubts may arise about its commitment to freer trade. Those doubts impair the chances of any liberalization effort. People in protected activities may be encouraged to exaggerate claims of injury in order to weaken the liberalization effort. They may also be encouraged to keep resources in previously protected activities in the expectation that their protests will be effective. Expansion of exports may be deterred by the slowness of liberalization and by the perceived likelihood that the policy will be reversed.

Another threat to more liberal policies is a massive deterioration in a country's balance of payments. In the long run, freer trade should have little impact on a country's overall balance of payments. The growth of imports should be matched by a growth of exports, leaving the current account unchanged at a higher level of total trade. In the short run, however, the current account may deteriorate as trade is liberalized, even if the exchange rate and fiscal policies are managed properly. Imports are instantly available and thus may expand before exports (which require investment and market development) have a chance to grow. If the deterioration of the current balance is too large, a government may be induced to restrict imports again.

This danger is acute if the government tries to support the nominal exchange rate through sterilized intervention. Intervention to support the exchange rate requires either that the government spend existing foreign reserves or that it borrow from international lenders. In either case, the government's fiscal deficit will expand, thereby contributing to the deterioration of the balance of payments.²⁰

As the balance of payments worsens, private agents may begin to anticipate either a devaluation or import controls. These expectations can lead to speculative purchases of foreign goods and speculative outflows of capital, further worsening the balance of payments. To forestall such a crisis, it is critical that the exchange rate be adjusted during the early stages of liberalization, and be adjusted further if the balance of payments suggests that such measures are necessary.

Credibility depends, finally and crucially, on the government's ability to show that its own finances are under control. Large government deficits reflect an excess of spending over income that contributes directly to trade deficits and raises the relative prices of nontraded goods. Government deficits financed by creating money raise domestic prices in relation to international prices. At a given nominal exchange rate, such inflation injures import-competing industries, blunts the incentives for increasing exports, and worsens the balance of payments. People who observe and understand this process will recognize that the government cannot sustain its announced policies and will have justifiable doubts that trade liberalization will continue.

Appropriate conduct of macroeconomic policy can play a crucial role in the success of trade liberalization. At a given nominal exchange rate, a trade liberalization that significantly reduces tariffs and quantitative restrictions on imports normally implies a reduction in the general level of domestic prices and wages, especially in the import-competing sector. To diminish recessionary effects of domestic price and wage deflation, it is often appropriate to devalue a country's currency in conjunction with a major trade liberalization. Monetary policy needs to be consistent with exchange rate policy—avoiding both restrictiveness that might induce recession and excessive ease that would fuel inflation and force future devaluations. Since trade liberalization can induce a short-run deterioration of the government's budget position, fiscal policy needs to remain restrained in order to limit the dangers posed by large government deficits. Wage policy should be directed toward facilitating adjustments in relative wage rates that accompany resource reallocations stimulated by trade liberalization. Credit policy should assume that adequate credit is available to finance expansion of export industries and that difficulties experienced by import-competing enterprises do not threaten the financial system. Finally, government policy should avoid large balance of payments deficits that create doubt about the government's ability to maintain a liberal trade policy.

This article expresses the opinion of the author and does not reflect the ideas or positions of the Council of Economic Advisors.

1. According to the analysis in Mussa (1976), with a constant nominal exchange rate and a constant supply of domestic credit by the central bank, trade liberalization would generate a temporary official settlements deficit and a permanent loss of foreign exchange reserves. These effects arise because trade liberalization reduces the long-run equilibrium level of nominal money balances desired by domestic residents.

2. Noncompetitive behavior by domestic sellers of imports may limit the immediate reduction in import prices. The fact that domestic services (distribution, packaging, marketing, etc.) are frequently bundled with imported products might mean that the final price of these products to consumers does not fall by the same amount as the price of raw imports.

3. The extent of the decline in the nominal price of nontraded goods, in the general domestic price level, and in the domestic prices of factors depends on budget shares, demand and supply elasticities, and the production structure of the economy. For a formal analysis of the relevant determinants of these price changes, see Dornbusch (1974 and 1980) and Sjaastad and Clements (1986).

4. See Frenkel and Mussa (1985) for a survey of much of the literature on the monetary approach to the balance of payments. See Mussa (1974 and 1976) for a more specific analysis of the effects of tariff rate changes in the context of the monetary approach.

5. It is possible to describe circumstances in which the nominal demand for domestic money would rise as a consequence of trade liberalization at a constant nominal exchange rate. It is doubtful, however, that these circumstances would be relevant for major trade liberalizations by developing countries.

6. If trade liberalization consisted of simultaneous removal of a general ad valorem import tariff and a general ad valorem export tax, the effect would be equivalent to an appreciation of the nominal exchange rate; an offsetting devaluation of the nominal exchange rate would thus be required to maintain price level stability.

7. The government should make it clear that devaluation is a one-time affair and that no further devaluations will occur at subsequent stages of the liberalization.

8. This evidence for the case of a large number of devaluations is summarized in Harberger and Edwards (1980).

9. For a discussion of the benefits of crawling peg arrangements, see Williamson (1966). For further discussion and analysis of the performance of such exchange rate regimes, see the papers in Williamson (1982).

10. The fiscal benefit of devaluation is an additional argument for considering devaluation in conjunction with trade liberalization, beyond the reasons already discussed.

11. Even for a small and relatively open economy, there is probably some latitude for monetary policy to diverge temporarily from the longer-run constraints imposed by exchange rate policy. But it is not appropriate to think that there is great flexibility for using monetary policy independent of exchange rate policy.

12. An important deficiency of most of the standard models employed in international trade theory is their assumption that labor is homogeneous and mobile between industries. Such models suggest that the only effect of trade liberalization on wages is its effect on the wage rate that applies to all workers.

13. It is now widely recognized that in the face of adverse changes in the terms of trade, indexing of wage rates should be related to the price index for domestic product and not the consumer price index; see, for example, Marston (1984) or Aizenman and Frenkel (1985). This principle needs to be extended to sectoral wage rates in circumstances where the relative prices of the outputs of different sectors are changing.

In a high-inflation country, it is desirable not to remove all indexing in the import-competing sector, but rather to allow sufficient flexibility in indexing arrangements that necessary adjustments can be made in relative real wage rates.

14. A big devaluation that allows the relative price adjustments required by trade liberalization to be achieved without large reductions in the nominal prices of import substitutes may assist in resolving these credit problems. Assuming the debt contracts are not indexed, the general price increase associated with such a devaluation reduces the real value of the debts of these firms by effectively imposing a capital levy on their creditors.

The real capital loss sustained by the creditors of import-competing firms because of devaluation may be no greater than the loss they would sustain from the failure and reorganization of these firms in the absence of devaluation. If so, it is appropriate to attribute these real capital losses to the liberalization, and not to the devaluation. Moreover, if there are inefficiencies in the operation of the bankruptcy process, there can be a social efficiency gain from policies that avoid large-scale bankruptcies.

15. It may be desirable to introduce some elements of trade reform or make some adjustments in trade policies in conjunction with financial reform. For example, if an export industry has benefited from cheap credit and is likely to expand under liberalized trade policies, it may be desirable to give it a temporary subsidy to compensate for the removal of credit subsidies.

16. As a result of the recent experience of some Latin American countries, a good deal has been written about the sequencing of trade liberalization and liberalization of controls on international borrowing; see Edwards (1986) for an analysis of this issue and a survey of the relevant literature.

17. For further discussion of these issues, see Mathieson and McKinnon (1981).

18. The reason for the success and failure of liberalization efforts in developing countries is the subject of a study currently being conducted under the auspices of the World Bank.

19. The effect of the phasing of liberalization on factor rewards is examined in greater detail in Mussa (1984).

20. This is the "fiscal effect" of sterilized intervention, which is present if private individuals do not increase their savings to offset the increases in their future tax liabilities that are implicit in the issuance of government debt. See Mussa (1985) for further discussion.

- Aizenman, Joshua, and Jacob Frenkel. 1985. "Optimal Wage Indexation, Foreign Exchange Intervention, and Monetary Policy." *American Economic Review* 75: 402–23.
- Dornbusch, Rudiger. 1974. "Tariffs and Nontraded Goods." *Journal of International Economics* 4: 177–85.
- . 1980. *Open Economy Macroeconomics*. New York: Basic Books.
- Edwards, Sebastian. 1986. "The Order of Economic Liberalization." In Armeane Choksi and Demetrios Papageorgiou, eds. *Economic Liberalization in Developing Countries*. Oxford: Basil Blackwell. Forthcoming.
- Frenkel, Jacob, and Michael Mussa. 1985. "Asset Market, Exchange Rates and Balance of Payments." In Ronald W. Jones and Peter B. Kenen, eds. *The Handbook of International Economics*, vol. 2. Amsterdam: North Holland.
- Harberger, Arnold, and Sebastian Edwards. 1980. "International Evidence on the Source of Inflation." Paper presented to the Conference on Inflation, Getulio Vargas Foundation, Rio de Janeiro, December 15–16.
- Marston, Richard. 1984. "Real Wages and the Terms of Trade: Alternative Indexation Rules for an Open Economy." *Journal of Money, Credit and Banking* 10: 206–21.
- Mathieson, Donald, and Ronald McKinnon. 1981. *How to Manage a Repressed Economy*. Essays in International Finance 145. Princeton, N.J.: Princeton University, Department of Economics, International Finance Section.
- Mussa, Michael. 1974. "A Monetary Approach to Balance of Payments Analysis." *Journal of Money, Credit and Banking* 6: 333–51.
- . 1976. "Tariffs and the Balance of Payments: A Monetary Approach." In Harry G. Johnson and Jacob A. Frenkel, eds. *The Monetary Approach to the Balance of Payments: Chicago Essays*. London: Allen and Unwin.
- . 1984. *The Adjustment Process and the Timing of Trade Liberalization*. NBER Working Paper Series 1458. Cambridge, Mass.: National Bureau of Economic Research.
- . 1985. *The Real Exchange Rate as a Tool of Commercial Policy*. NBER Working Paper Series 1577. Cambridge, Mass.: National Bureau of Economic Research.
- Sjaastad, Larry, and Kenneth Clements. 1986. "The Incidence of Protection: Theory and Measurement." In Larry Sjaastad, ed. *The Free Trade Endeavour in Latin America*. London: Macmillan for the Trade Policy Research Centre. Forthcoming.
- Williamson, John. 1966. *The Crawling Peg*. Essays in International Finance 50. Princeton, N.J.: Princeton University, Department of Economics, International Finance Section.
- . 1982. *Exchange Rate Rules: The Theory, Performance and Prospects of the Crawling Peg*. London: Macmillan.

MANAGEMENT OF PUBLIC INDUSTRIAL ENTERPRISES

Mahmood A. Ayub and Sven O. Hegstad

Why do some state industries do better than others? Those in Brazil, for example, achieve better financial and economic results than their counterparts in Ghana or Pakistan. Yet within Brazil, the national iron ore company (CVRD) and the national petroleum company (PETROBRAS) are much more successful than the copper and railroad companies. In India, Hindustan Machine Tools is a dynamic concern; other public enterprises, even those in the same industry, are far less successful.

The variations have two possible sets of explanations. The first consists of country-specific characteristics—cultural, social, political, macroeconomic, and institutional. These explain differences between countries in the performance of state industries. The other covers differences that are specific to particular companies, such as the degree of autonomy, domestic and foreign competition, and the corporate and managerial culture. This set explains why, within the same country, state firms vary in their performance.

The two sets of factors clearly overlap. This article deals only with those influences on performance that are peculiar to public firms and can be affected by policymakers. It therefore excludes cultural and social factors, even though these can be of critical importance in determining the success of public enterprises. Similarly, the quality of individual chief executives significantly affects the performance of public enterprises, but that is also true for private firms. The article also excludes the macroeconomic and institutional environment, because that matters for public and private firms alike. However, the study does assume that governments intent on improving the performance of state enterprises would adopt appropriate macropolicy measures as well.

This study deals chiefly with public *industrial* enterprises. Since they generally produce tradable goods in markets with varying degrees of competition, they are distinct from enterprises such as utilities and transport companies, which often are natural monopolies. However, most of the organizational and management issues facing state industries are relevant to other public companies, though the remedies for poor performance may differ.

The Role of Public Industrial Enterprises

Of the 500 largest non-U.S. industrial corporations on the *Fortune* list for 1985, some 71 were in the public sector. They accounted for 19 percent of sales, 21 percent of assets, and 26 percent of employment in the 500 firms. Over the past decade the importance of these state companies has increased (see table 1).

There is no indication that the share of public ownership of industrial value added is related to a country's gross domestic product (GDP) per capita.¹ Economic, political, social, and historical factors have determined the size of a country's public sector, regardless of its stage of economic development. Nonetheless, there does seem to be a pattern to the share of public ownership among various subsectors, regardless of whether a country is developed or developing. This pattern (see table 2) can be explained largely by whether certain industries are considered to be strategic or to possess economies of scale.

The share of public industrial enterprises in total value added is generally much smaller than their share in total investment—that is, they are more capital-intensive than private companies are. For the sample countries, the average share of public industrial enterprises in investment was 26 percent, more than twice their 11 percent share in GDP. As Sheahan remarked, “in Brazil and in India it is almost as if industries were divided between private and public enterprise according to their capital intensity” (Sheahan 1976). To a large extent, this

Table 1. *Share of Public Enterprises in Non-U.S. Fortune 500 Companies, 1975 and 1984*

<i>Item</i>	<i>1975</i>	<i>Percentage of total</i>	<i>1984^a</i>	<i>Percentage of total</i>
Number of enterprises	54	10.8	71	14.2
Total sales (us\$ billion)	162	19.7	359	19.0
Total assets (us\$ billion)	156	20.5	339	21.0
Total employees (million)	3.0	17.5	3.8	21.4

a. A significant portion of the increase in the number of public enterprises, their sales, and assets is explained by the nationalization of many industrial enterprises in France since 1981.

Source: Fortune, August 1976 and August 1985.

Table 2. Public Ownership of Selected Industrial Subsectors, 1984

Country	Textiles	Electronics	Petro-chemicals	Cement	Motor vehicles	Mining	Fertilizers ^a	Steel	Telecom-munications ^b
Austria			n.a.						
Brazil									
France									
Ghana	n.a.				n.a.			n.a.	
India ^c									
Israel ^d						n.a.			
Italy									
Pakistan									
Portugal					n.a.				
Sweden									
Tunisia					n.a.		n.a.	n.a.	
Zambia		n.a.			n.a.			n.a.	

Nearly all private
 25 percent public
 50 percent public
 75 percent public
 Nearly all public
 n.a. Not available or negligible.

Notes: In a number of industrial and developing countries, some public companies have substantial (but less than 50 percent) ownership in private hands. However, for the purpose of this article, these companies are considered fully public.

a. Nitrogenous fertilizers only.

b. Services, not manufacturing.

c. The entry for motor vehicles takes into account the recently established, publicly owned Maruthi plant.

d. The entries for motor vehicles and steel indicate majority ownership not by the private sector but by the General Federation of Labor Trade Unions (Histradut).

bias reflects the fact that some public enterprises were set up precisely because the capital requirements of industries such as steel and oil refining were too heavy for the private sector to finance. However, it may also reflect the way that public enterprises are able to obtain relatively cheap financing from the state and thus are encouraged to favor capital-intensive production.²

Performance of Public Industrial Enterprises

Assessing the performance of state enterprises is made difficult by inadequacies in the available data. This study accordingly used a "weight of evidence" approach, of the kind favored by historians and jurists, rather than one of testing hypotheses statistically. Relevant indicators include financial profitability, self-financing ratios, productivity growth, and the contribution of state enterprises to budgetary deficits and external debt.

Financial profitability is far from perfect as an indicator of performance. Big profits may indicate efficiency, but they may also reflect market distortions and monopolistic pricing. For example, some of the more profitable public enterprises in Ghana (including the distillery and cocoa factories in Accra and Takoradi) owe their financial success almost wholly to monopolistic positions and to heavy protection from foreign competition; at international prices, their value added is negative. In Pakistan, some 90 percent of the sales of public industrial enterprises are subject to price controls. However, financial profitability does have the merit of showing whether a public enterprise depends on the national treasury for its operations. As will be argued later, the degree of managerial autonomy in state enterprises (which is an important determinant of performance) depends largely on the degree of independence from treasury financing.

The data for the sample countries show that the financial rates of return for public industrial enterprises have generally been low. For example, the fifteen largest Portuguese public enterprises achieved an average rate of return on capital of about 10 percent in 1977–83, compared with an inflation rate averaging about 21 percent a year. In Ghana, the comparable rate of return was about 18 percent, compared with an average rate of inflation of 96 percent. In Pakistan, the return on capital averaged about 2 percent during the 1970s and slightly over 4 percent during 1980–83, compared with an average rate of inflation over the whole period of about 12 percent.³ In India, the average pretax return on capital in 140 public companies in 1978–83 was about 11 percent in current terms—but more than 90 percent of the profits came from the petroleum industry.

Among industrial countries, Austrian public industrial enterprises (in the OIAG Group) registered an average return on capital of about 3 percent during 1975–80; since 1980 many of the firms have made

losses. In Sweden, the Statsforetag enterprises kept fairly even pace with the rest of Swedish industry during 1970–76 in both sales per employee and profitability, even though their return on capital reached the 10 percent target only once (in 1974). However, the group made losses in all subsequent years until 1983.

In real value added growth, the relative performance of public enterprises has been somewhat better. For example, Brazil's public enterprises expanded their real value added by 3.7 times during 1966–75, compared with 2.4 times in Brazilian industry as a whole (though there are no data to show how far this difference reflects a higher level of investment by public enterprises or a faster increase in total factor productivity). Since 1975, value-added increases have been significantly lower, both for public enterprises and for industry in general. Similarly in Portugal real value added per employee in the thirteen largest state industries increased by 83 percent during 1976–79. In subsequent years the increase was only 2 percent.

Financial performance varies widely among public enterprises in the same country and between the same industries across countries. In Israel, within the Israel Chemicals Limited (ICL) group, the most profitable subsidiary—the Dead Sea Works—had an average annual return on revalued capital of 12 percent in 1980–83 and 18 percent in 1984, rates that are considered high for the heavy chemical industry. But another subsidiary in the same group—Chemicals and Fertilizers—has been barely profitable, to some extent because it has concentrated on the domestic market where fertilizer prices are controlled. In Zambia, some subsidiaries of Indeco (such as Zambia Breweries, Zambia Oxygen, National Breweries, Zamefa, Supa Baking, and Chilanga Cement) are highly profitable, whereas Luangwa Industries, Zambezi Sawmills, Nitrogen Chemicals, and Livingstone Motors have been loss-makers. In Ghana, the best performers have been GIHOC's cocoa-processing factory, a liquor distillery, and a fruit cannery; its two sugar factories have made big losses. In Brazil, PETROBRAS and CVRD have been consistently profitable, as have a few smaller public enterprises (such as Mafersa, Celma, and Tasa), but the iron and steel companies (Siderbras, Acesita, and Siderama) have been substantial loss-makers. In India, the gross profits (before tax and interest charges) of state industries during the early to middle 1970s averaged about 19 percent for the petroleum industry, 11 percent for medium and light engineering, 2 percent for steel, and –3 percent for minerals and metals.

The same variation in performance occurred in the industrial countries in our sample. In Austria, OMV and SGP have been the only consistently profitable public industrial enterprises; the largest loss-makers were the two steel companies, Voest-Alpine and VEW. In France, state industries can be classified into three groups according to

their profitability: the heavy loss-makers (the two steel firms, Usinor and Sacilor, and, since 1983, Renault); those firms that break even or have light losses (mainly Thomson, the electronics and telecommunications company, and EMC, the chemical company); and the profitable firms (such as Dassault, Matra, Saint-Gobain, and Roussel).

Across industries, too, variations in profitability have been significant (table 3). The most profitable subsectors in 1984 were mining and petroleum; the least profitable, steel and automobiles. Almost without exception, steel companies have been the largest drain on national treasuries. Surplus capacity and low prices have resulted in huge losses in many countries, including France, Italy, Sweden, Brazil, Austria, India, and Pakistan. The fact that the steel industry is considered strategic and is usually dominated by strong trade unions has made it hard to reduce costs.

Comparing Public and Private Performance

Any comparison of state industries with their private counterparts needs to be made with caution. Public enterprises are often expected to fulfill at least some social objectives, and this can affect their financial performance. Moreover, the public sector in many countries includes loss-making companies that governments acquired for non-economic reasons. Furthermore, the public sector is often dominated by slow-growing basic industries. Further problems can arise when too static a view is taken—as when, for example, a new inexperienced public enterprise is compared with a well-established private one. In this sense, comparisons of public and private firms' performance in

Table 3. Profitability of Public Industrial Enterprises, by Subsector, 1984

<i>Subsector</i>	<i>Number of firms</i>	<i>Number of loss-making firms</i>	<i>Gross assets (us\$ billions)</i>	<i>Net income (us\$ billions)</i>	<i>Net income as % of gross assets</i>
Mining ^a	5	1	14,808	1,097	7.4
Petroleum ^b	26	2	183,356	7,029	3.8
Tobacco	2	0	874	16	1.8
Chemicals	5	2	17,895	293	1.6
Aerospace	3	0	7,751	73	0.9
Electronics	2	1	16,657	66	0.4
Steel and metal manufacturing	15	7	49,234	-1,853	-3.8
Motor vehicles	4	2	25,949	-1,467	-5.7
Total	62	14	316,524	5,254	1.7 ^c

a. Average profitability was substantially affected by CVRD of Brazil. Without it, the average falls to 2.9 percent.

b. Not included is YPF of Argentina, whose large losses distort the picture considerably. If YPF were included, average profitability would decline to 1.8 percent.

c. Average, not total.

Source: "The Largest Non-U.S. Corporations Ranked by Sales," *Fortune*, August 19, 1985.

this study (and most others) are not rigorous; they should be considered as only indicative and illustrative.

With these caveats, the evidence in this study suggests that within the sample countries, and sometimes within the same industries, public enterprises have generally been less profitable than private ones. In Israel, for example, a sample of twenty-five state industries and thirty-seven private companies (in which fourteen public and twenty-four private ones were in the same industrial subsectors) showed that pretax profits for public enterprises averaged 1.6 percent of sales in 1976–78, compared with 11.6 percent in private companies (Diskin 1980). A comparison of large public and private Brazilian firms for 1974 and 1978 indicates that the rate of return on equity for public enterprises was roughly one-half the return earned by the private sector. In India, which has one of the largest and most diversified public sectors among developing countries, the financial performance of public enterprises has been significantly worse than that of private enterprises in the same industry, though not necessarily in the same product line (Sri Ram and others 1976). A recent study of India's fertilizer industry concluded that, while productivity in the most efficient public enterprises was comparable with that in the best private firms, in the public sector as a whole it was lower than in the private sector (Gupta 1982). The differences in performance were explained partly by the higher input costs of public enterprises—the result of their obligation to use indigenous feedstocks and of their outmoded technology (public fertilizer plants were established as “pioneer” enterprises in the 1950s, whereas the first private firm started in 1968).

In the case of France, the publicly owned Renault Company more than held its own with private French automobile companies until 1983. However, research for this study indicates that French state companies were more severely affected by the recession of 1980–82 than their private counterparts and recovered less rapidly. As public enterprises often borrow at lower rates of interest than private firms can, the difference in performance between public and private firms is even greater than the statistics presented in table 4 suggest.

The relatively poor performance of state industries can largely be explained by their concentration in product lines and basic industries (such as steel, automobiles, and fertilizers) that have experienced little growth in recent years, or in developing new industries (such as aerospace). However, it is still true that these enterprises have contributed significantly to the macroeconomic problems of many countries. For example, in Brazil during 1980–82, the major federal enterprises accounted for almost 50 percent of the overall deficit of the federal government. In India, the net transfers (current and capital) from the central government to public industries increased from about US\$890 million in 1978 to US\$2.3 billion in 1983. State industries have also

Table 4. *Financial Profitability of Enterprises in Non-U.S. Fortune 500 Companies, 1984*
(percent)

<i>Subsector</i>	<i>Public industrial enterprises</i>	<i>Private industrial enterprises</i>
Mining	7.4	15.5
Petroleum	3.8	4.4
Tobacco	1.8	8.5
Chemicals	1.6	3.5
Aerospace	0.9	2.9
Electronics	0.4	3.6
Steel and metal manufacturing	-3.8	0.7
Motor vehicles	-5.7	3.3
Weighted average	1.7	4.0

Note: Profitability is defined as net income as a percentage of gross assets.

Source: "The Largest Non-U.S. Corporations Ranked by Sales," *Fortune*, August 19, 1985.

been responsible for a significant part of the external debt in some countries.⁴ Most notably, Brazil's public enterprises account for over two-thirds of the country's external public debt. In Zambia, the foreign debt of ZIMCO alone accounts for over half of the country's total debt. At the end of 1982, public enterprises accounted for about 60 percent of Portugal's external public debt of US\$13.5 billion and some 90 percent of its short-term external liabilities of US\$4 billion.

The response of several developing countries to mounting economic problems has been to tighten their monetary policies. In the absence of a tighter fiscal policy, there has been some "crowding out" of the private sector even in countries such as Brazil and Turkey that attach great importance to private sector development. It would have been better to reduce the public sector deficit and ease the constraints on credit to private companies.

Key Determinants of Performance

No country, developed or developing, has devised a perfect way to manage its public industrial enterprises. Even if one were found, social and cultural differences would make its blind replication almost meaningless. But of the many ways of managing public enterprises, some are clearly better than others.

To some extent, the reasons why public industrial enterprises generally do less well than their private counterparts are due to the differences inherent in their ownership. These include the fact that the directors of public enterprises (government officials) have no financial stake in the business; the limited threat of bankruptcy and reorganization, because of the easy recourse that state firms have to government

finance; political opposition to reducing payrolls, even when financial conditions suggest that is needed; and the circuitous chain of decision-making devised to ensure public accountability. However, these inherent factors are only part of the explanation. Evidence from our study indicates that three other influences are equally important: the competitive environment, financial autonomy and accountability, and the extent and manner in which managerial autonomy and accountability are ensured. These will be examined in turn.

Although it is impossible to make a rigorous statistical analysis of the correlation between competition and performance, evidence from the sample countries strongly indicates that those state industries subject to a more demanding, competitive environment tend to perform better. For both public and private firms, the biggest constraints on competition are inappropriate macroeconomic, trade, and industrial policies. These include overvalued exchange rates, import quotas and bans, high tariffs, price controls, domestic content legislation (especially in automobiles and electronics), investment licensing, and regulations on entry and exit.

Competition

As well as changing these policies, governments can do some specific things to foster competition for state industries. Such competition can occur even among public enterprises that are considered strategic. A good example is the Heavy Mechanical Complex (HMC) at Taxila in Pakistan. The company faces competition in the production of road rollers and sugar mills from the privatized firm Ittefaq Foundry. In the construction of cement plants it has to compete not only with imports (allowed in with a duty of 20 percent), but also with another public enterprise, Karachi Shipyard. In electrical towers, boilers, and overhead traveling cranes, it faces competition not only from private firms but also from the publicly owned Pakistan Engineering Company (PECO). The competition facing the various petrochemical subsidiaries of PETROBRAS in Brazil is even more intense.

There is every reason to believe that Festinger's social comparison theory, which states that "people most strenuously seek to evaluate their performance by comparing themselves to others, not by using absolute standards" (quoted in Peters and Waterman 1982), applies to public enterprises as well. Central monitoring agencies should therefore make information on comparative performance widely available. In countries where such agencies review performance targets, they could make a comparative analysis of performance with all the state industry managers present at the time—and the results could be widely publicized. Many public enterprise managers interviewed in Brazil and Pakistan stressed their fear of unfavorable coverage in the national press.

Another way to subject public enterprises to competitive pressures is to encourage them to export. Of course, no amount of encouragement or cajoling can make them export if the macro framework is biased strongly the other way. But so long as the framework is appropriate, even a small amount of exporting can make a big difference. India's HMT exports only about 8 percent of its sales, but this seems to be enough to give the company access to new management techniques and new technologies.

In industries in which economies of scale are not important, competition can also be enhanced by breaking up monolithic holding companies or even large enterprises. The break-up of Statsforetag in Sweden into smaller sectoral holding companies has definitely increased competition and made public enterprises more conscious of efficiency. The proposal of the new Bolivian government to break up the Bolivian Mining Corporation (COMIBOL) into several competing companies could be a useful experiment. Occasionally, the break-up of large enterprises may be necessary but not sufficient for better performance. For example, the breaking up of FCI in the early 1970s in India made only a limited difference, mainly because the companies were still hampered by tough regulations. This underlines the importance of a favorable regulatory and policy environment within which companies can change their performance.

Financial Autonomy and Accountability

One of the main reasons why public industry runs into financial and economic problems is the lack of a clear separation between management and operations, on the one hand, and political and strategic considerations, on the other. In many cases, this results in diffuse and conflicting objectives, a loss of the managerial autonomy needed for efficient commercial operations, and a civil service culture where chief executives are more administrators than entrepreneurial businessmen. In such an environment, employment, investment, and pricing decisions are often made without due consideration for their financial consequences.

The confusion of operational and political responsibilities is often the starting point of a vicious circle for state industries. Once a firm is driven into loss, staff morale suffers and performance then deteriorates even further. As the financial problems accelerate, the government is forced to centralize decisionmaking even more and impose more controls. It injects more and more capital into the loss-makers and tries to retain staff by paying them higher and higher salaries. For example, in Portugal it was found, among the fifteen largest public enterprises visited, that the loss-making ones on average had increased salaries significantly more than the profit-making ones. But financial support alone gives only temporary relief, unless it is combined with

comprehensive restructuring. In many cases that happens only after a series of costly crises. This vicious circle is illustrated in figure 1.

A prerequisite for improving the performance of state industries is to delegate more decisionmaking to their managers. The managers interviewed for this study cherished financial autonomy above all, in the sense of being substantially free of the need to rely on treasury financing. The two French steel companies (Usinor and Sacilor) have been chronic loss-makers; as a result all major decisions require prior approval by their sponsoring ministry. By contrast, Saint-Gobain and Roussel, essentially profitable, have enjoyed the greatest possible managerial autonomy. Similarly, in Sweden the profitable Tobacco Company has had significantly more freedom than the loss-making NJA (steel) company, even though both are subsidiaries of the same holding company, Statsforetag. Profitability also largely explains the greater autonomy of PETROBRAS and CVRD in Brazil as compared with the steel companies and the railroad company (RFFSA). And Israel Chemicals Limited, one of the most autonomous public enterprises, has had no major financial support from the government since it was established in 1967, relying instead on retained profits.

There are several ingredients of financial autonomy: greater market discipline, sound financial objectives, clear social objectives, elimination of subsidies, appropriate capital structure, greater discipline in financial relations, and establishment of performance measurement and incentive systems.

Greater Market Discipline

A combination of more autonomy in financial matters and greater exposure to markets normally creates among public enterprise managers a stronger sense of responsibility and a deeper interest in the financial health of their company. One way of institutionalizing financial discipline is to give state industries access to capital markets. Independent bankers scrutinize investment and financing decisions before they provide any loans. The use of bond markets, equity markets, and joint ventures opens the public enterprise to public scrutiny and to special audits and reporting requirements. Interviews with man-

Figure 1

agers in Israel suggested that in companies whose minority shares are traded on the Tel Aviv Stock Exchange (such as Dead Sea Works, Chemicals and Fertilizers, and Cables of Zion), financial performance and discipline have been improved because of the obligation to publish semiannual financial statements and because of the firms' potential exposure to legal suits by shareholders for nonbusinesslike management.

Whenever possible, public enterprises should be encouraged to raise money from private creditors rather than the government and the central bank. When government provides the finance, it should charge market interest rates, and it should encourage joint ventures and the floating of a minority of the equity of state companies.

Sound Financial Objectives and Dividend Policies

Sound financial management involves specifying a company's financial objectives, monitoring progress toward them, and holding managers accountable for the outcome. The main measures of performance include return on assets or capital employed, return on equity, dividend pay-out ratio, debt equity ratio, and a prespecified level of internal financing of large investment projects. In varying degrees, these ratios are being used by public enterprise managers in the sample countries. One exception is Austria, where financial objectives are not defined explicitly but are couched in terms of "satisfactory" profitability and cash flow. In Sweden, officials of the agency that oversees state industries argued the establishment of broad financial objectives and enforcement of a clear dividend policy are even more essential in state enterprises than in private firms. They stressed that even though the dividends paid by state companies are often small, the principle of paying them matters more than the amount. In most countries in this study, dividend payments were either insignificant or nonexistent. But the enforcement of a dividend policy demonstrates unmistakably that the government gives high priority to financial management. It also forces management to focus on productivity and profitability improvements so as to meet the company's "new" financial obligations.

Clear Social Objectives

Public enterprises are often expected to pursue social objectives as diverse as redistributing income, subsidizing particular regions of a country, and creating or maintaining employment. The problem is not the fulfillment of these objectives, which can often be desirable. The problem is that the multiplicity of objectives and the absence of a sense of priorities allow social goals to become an excuse for poor performance. (In contrast, the maxim of Texas Instruments of the

United States is “more than two objectives is no objectives.”) Perhaps the best examples in our sample of countries are the bicycle plant at Chipata in Zambia, the Aboso Glass Factory and the Bolgantanga Meat Factory in Ghana, and the Bolan and Shahdadt textile mills in Pakistan. Among industrial countries, a good example of conflicting objectives is the state-owned aluminum company (ASV) in Norway, whose operations are substantially constrained by the need to provide employment in a region with few alternative job opportunities. Social objectives have also been extremely onerous for CDF-Chimie (heavy chemicals) and EMC (chemicals) in France. In the case of EMC, it has been estimated that the cost of providing specific social services exceeded its overall deficit in 1984.

When using state industries for social purposes, governments need to consider two questions. Are the social objectives being fulfilled? Are there no better ways of achieving them?

There is evidence that the pursuit of social objectives by public enterprises can produce perverse results. One example is Zambia’s publicly owned agro-based industries (largely producing vegetable oil products, detergents, and soap), where stringent price controls on refined oil and fats (only recently lifted) have led not only to large financial losses but also to low morale and a shift in the product mix away from the production of oil and fats. This result was precisely opposite to the government’s social priorities. Price controls are intended to benefit the poor, but end up subsidizing large industrial users, wholesalers, or affluent urban dwellers. The State Cement Corporation of Pakistan (SCCP) has sold cement in Lahore at a price that was Rs0.2 a bag below the cost of production plus freight charges (from its Zeal Pak plant at Hyderabad, some 700 miles away); it did so chiefly to appease the urban elite in the city where the head office is located. In other countries, similarly excessive efforts to promote employment have resulted in serious losses of efficiency and low morale (see Shirley 1983).

In many instances, there may be better ways of making social changes. For example, the objective of regionally balanced economic growth is better achieved by encouraging private investment through tax concessions and cash grants. The impressive industrial growth in the economically depressed Northeast region of Brazil over the past two decades was achieved with hardly any public investment. Often it is more effective to allow public enterprises to operate on commercial, profit-seeking lines and then use their profits to achieve such goals as income redistribution and employment creation.

Even in cases where *investment* decisions have been taken on social grounds, the *operational* decisions need not be (Jones 1983). In some of the sample countries, governments have set up large integrated iron and steel plants largely or wholly for strategic and national security

reasons. These noncommercial objectives are achieved once the plant is working. Thereafter it can be left to operate along commercial lines. It may well earn a lower financial return as a result of its poor location or absence of comparative advantage, but society stands to gain by allowing the plant to earn as high a return as possible.

In some countries, especially France, Italy, and Sweden, public enterprises are compensated explicitly on a contractual basis for undertaking social objectives.⁵ This approach helps to ensure that state companies are not saddled with excessive social burdens and, at the same time, avoids random departures from efficiency criteria. However, such compensatory payments should be viewed as second-best or even third-best solutions, and thus used sparingly. Moreover, if the contracts become too large relative to a public enterprise's normal activities, management may lose sight of its main objective.

Elimination of Government Subsidies

Easy recourse to government subsidies usually reduces the pressure on public managers to close nonviable operations and control costs. When state enterprises are heavily dependent on subsidies, the government and management should agree on a plan for phasing them out over a limited period. This action may have to be matched by a program of physical and financial restructuring.

Appropriate Capital Structure Policies

Several major benefits arise from using a proper mix of debt and equity, as opposed to using mostly or only debt in financing public enterprises. A mixture of debt and equity increases the enterprise's ability to borrow in financial markets, serves as a check against overexpansion, stimulates a keener awareness of profit, and strengthens a company's ability to survive recessions.

Greater Discipline and Transparency in Financial Relations

The accounts of the major public enterprises in our sample contained a complicated maze of transfers between central government and public enterprises. To improve financial discipline and to be able to record "true" financial results, governments should demand tax, duty, interest, dividend, and amortization payments from public enterprises, just as they do from private companies. Losses and negative cash flow would then have to be financed in a more transparent way through new equity, loans, or other means.

If governments are to require financial discipline from public enterprises, they must demonstrate the same quality in their own financial

management. They can do so in various ways: (a) a government commitment to pay in new equity capital as part of a large investment project should duly consider the risks involved and the government's own capacity to afford the capital; (b) when government payments to public enterprises have been approved by the appropriate ministries, they should not be questioned and delayed by other ministries; and (c) public enterprises should not be used to finance government deficits. This last point means that viable enterprises should be allowed to decide how to use their surpluses. The rationale is that public enterprise managers who have made profits are normally better placed to decide upon its productive use than are bureaucrats more distant from the market place.

Establishment of Performance Measurement and Incentive Systems

An effective system for measuring and controlling performance will reveal whether, and how far, the directors of state industries are meeting their financial commitments. It underlines the importance placed on financial objectives, performance, and discipline. It is a basis for rewards and punishments. And it gives the government a tool to control the credit it is advancing to state enterprises as a whole.

The amount of detail in an ideal financial system will vary from country to country and firm to firm. In general, the more an enterprise is subject to competitive market forces and the less it depends on government financial support, the less detailed will the centralized data requirements need to be. In countries such as France, Norway, and Sweden, it may be enough to collect the enterprises' annual reports. But in countries such as Ghana and Zambia, governments may have to require quarterly financial statements and production and personnel data and may publish a summary of the performance of all public enterprises at the end of each year.

The monitoring arrangements need to be linked to an incentive system. Incentives are most effective in a relatively competitive environment and where managers have considerable financial and managerial independence. In highly protected economies, bonuses need to be used with caution since they may well increase the incentive for an inefficient expansion of operations.

Two key determinants of the performance of state industries are the extent to which the government decentralizes decisionmaking to their managers, and how it manages its relations with them. This section deals with the issue of *how much* decisionmaking power should be delegated and what managerial environment can help in decentraliz-

***Managerial
Autonomy
and
Accountability***

ing. Once the government has decided how much control it wants, the other issue is *how* it organizes its ministries, specialized agencies, and other bodies to enable it to exercise that control effectively.

Private enterprises are run within three different frameworks: ownership, strategic, and operating. The role of the owners is to define the business charter, set the overall objectives of the enterprise, appoint and dismiss the board of directors, and approve annual accounts and dividend payments. These powers are formally executed through an annual shareholders' meeting. The strategic role is the responsibility of the board of directors. Its major functions are to decide on plans, to monitor performance against targets, and to appoint, advise, and dismiss the chief executive. Typically, the board meets four to eight times a year and is composed of people with stature and relevant professional experience. The operating role is performed by the chief executive and his top management. Their responsibility is to manage and develop the business in accordance with agreed objectives.

How do the organizational structures of state industries differ from this prototype? The short answer is that governments, as owners, invariably encroach on the strategic and operational functions—and this is the cause of much of the poor performance of state companies. A simple example can illustrate what happens. In several sample countries, boards of directors have to seek ministerial approval for relatively small investments, hiring and firing of staff, wage setting, decisions on working capital, procurement policies, foreign travel, and much else. It may sometimes be justified for governments to involve themselves in decisions that private firms would handle at the board level. But involvement in operational matters is time-consuming for an already overstretched bureaucracy; the ministries lack the information and the business perspective to make the correct decisions; and, most important, it absolves the management of its responsibility and accountability for how a company performs.

The countries included in this study provide a rich variety of organizational structures. The most decentralized are those in Sweden and Norway. Intermediate ones are in Austria, Brazil, France, Israel, Italy, and Portugal, while highly centralized structures are found in Ghana, India, Pakistan, and Tunisia. A comparison of the two polar cases—Sweden and Norway, on the one hand, Ghana, on the other—is instructive. In Sweden, the Cabinet, the formal owner of public enterprises, has delegated this responsibility to the Ministry of Industry. Within the ministry, a Unit for State Participations (Unit 5), staffed by eight professionals, actually executes the ownership role for the state industries, which employ some 90,000 people. In Norway, a similar number of staff within the Ministry of Industry perform the ownership role for state industries, which employ 50,000 people. The Unit for State Participations does not intervene in the boards' decisionmak-

ing, does not maintain a data bank of financial or operational data, does not keep a roster of management candidates, and does not perform any management services. Executives of Unit 5 are directors on only a limited number of boards. They stress that, in their role as board members, they take care to act in the best interests of the enterprise and *not* to overpower the board with their ownership role. Only in times of crisis and when state financial support is required does the Unit for State Participations increase its involvement in decisionmaking. Most public enterprises are organized as limited liability stock corporations and are regulated by corporate law. Where a firm also has private shareholders, the board reflects the fact.⁶

For the past fifteen years most of Sweden's state enterprises were organized under one superholding company. This company was recently broken down into one holding company for medium-size enterprises and a number of branch-oriented corporations, each owned directly by the Ministry of Industry. This change was in line with the government's belief in decentralized decisionmaking.

By contrast, public enterprise managers in Ghana have little autonomy. Their companies were responsible for about 60 percent of total industrial production in the country in 1975–81, but their performance has generally been poor. The Ghana Industrial Holding Company (GIHOC) was established in 1967. A central government body named the State Enterprise Commission (SEC), with varying responsibilities for development and control of public enterprises, has been established and reestablished three times, in 1965, 1976, and 1981. In its current incarnation, its roles are to advise the government on issues involving performance, strategy, finance, and personnel and to monitor and evaluate performance. The structure of control places the ownership role with the sectoral minister. Lines of responsibility are then supposed to flow through the holding company's board and management down to the board and management of the operating companies. In practice, most control remains in the ministries, with the sectoral ministers holding the key positions. For example, prices are set by the Prices and Incomes Board, a unit under the Ministry of Finance and Economic Planning. The dismissal of five or more workers must be authorized by the Ministry of Labor (except in cases of proven criminal offenses). Import licenses are allocated by the Ministries of Trade and Finance, while letters of credit for approved import licenses are the responsibility of the Bank of Ghana and the commercial banks. Approval of immigrant quotas for non-Ghanaian staff is handled by the Ghana Investment Center and the Ministry of Interior. Wage contracts need the recommendation of the Prices and Incomes Board and the approval of the Ministry of Finance.

Many government officials involved in public enterprises underestimate the complexities of running a company. An enterprise is not

only input, production functions, systems, and output. Its success depends on creativity, flexibility, dedication, perseverance, and hard work, particularly of top managers. Most of the planning officials and civil servants appointed as directors and chief executives of public enterprises lack the knowledge, experience, and motivation to blend together the many ingredients of a successful company. Governments should therefore hire top-quality entrepreneurs and managers and should design the organization in such a way as to shield these people from undue political and bureaucratic interference.

As economies move from industrial infancy through growth and maturity into the postindustrial era, so their state industries tend to

change their organizational structures. At the risk of oversimplification, figure 2 and table 5 show five increasingly decentralized stages, which are mirrored in the whole process of industrialization. As industrialization advances, so the complexities and competitiveness of the marketplace and the speed of change all accelerate. Rigid and bureaucratic management models become obsolete; decentralized structures become a necessity for survival.

Naturally, not every country will necessarily go through all five types of organization, but most countries go through a process of decentralization. For example, India never used

holding companies on a big scale, although its ministries sometimes functioned like holding companies. Some countries may temporarily move toward more centralized structures; this happened in Brazil in the 1980s, as a response to the sprawling growth of state industries in the 1970s. Similarly, public enterprises in Italy enjoyed considerable autonomy in the 1950s and the early 1960s, but this was reduced because of an ideological shift toward central planning. There have been relatively few such periods, and they do not reverse the long-term trend of increasing decentralization. Recently, the Italian superholding company, IRI, has adopted a divestiture strategy of selling part of the equity of its major subsidiaries to the private sector.

There is no reason for developing countries to wait for the post-industrial era to move into some of the more decentralized forms of organization. Naturally, the types of powers granted and of services provided by central units, and the mix between market and government controls, will vary significantly between countries. But these varying levels of powers, services, and controls could basically apply within the same type of decentralized structure.

It may be that the role of state industries in economic life will

Figure 2

Table 5. *Characteristics of Public Enterprises by Stage of Development*

<i>Stage</i>	<i>Characteristics</i>
1. Infancy	Public enterprises are organized as departments of government. <ul style="list-style-type: none"> • ownership role: government • strategic role: government • operating role: government
2. Growth	Public enterprises are regulated by civil service codes. <ul style="list-style-type: none"> • ownership role: government • strategic role: government and management • operating role: management and government
3. Maturity	Public enterprises are governed by holding and superholding companies. <ul style="list-style-type: none"> • ownership role: government • strategic role: holding company • operating role: management
4. Renewal I	Public enterprises are owned by government and regulated by commercial codes. <ul style="list-style-type: none"> • ownership role: government • strategic role: board of directors • operating role: management
5. Renewal II	Public enterprises are joint public-private ventures; stocks are issued on stock exchanges. <ul style="list-style-type: none"> • ownership role: government and private • strategic role: boards of directors • operating role: management

shrink from now on. Most of the circumstances that motivated the creation of public enterprises, such as the lack of industrial infrastructure, the nonexistence of equity markets, and a limited private sector, have diminished in importance. The emerging high technology and service-related industries are typically not capital-intensive; and being entrepreneurial in character, they are ill suited to the bureaucratic cultures frequently found in public enterprises. Some longstanding state industries are being wholly or partly privatized in countries as diverse as the United Kingdom, Norway, Sweden, Italy, Spain, the Federal Republic of Germany, Japan, Turkey, Uganda, Togo, Cameroon, Brazil, and Argentina.

The experience of state industries, as well as of large private enterprises, shows that the worst repercussions of a poor organizational structure can be avoided through scrupulous adherence to the following principles: (a) clear demarcation of the roles and responsibilities of the government, the board of directors, and the management of public enterprises; (b) full delegation of authority in line with delegated responsibility; (c) appointment of professional directors and managers with experience directly relevant to their tasks; and (d) introduction of a management philosophy that judges managers on the basis of financial viability and a limited set of other indicators. Adequate

decentralization is not, by itself, enough for satisfactory performance. However, its absence can confound even the most meticulously designed organizational structure.

Coordination within the Government

Once the government has decided *how much* decisionmaking power to delegate, the next issue is *how* to organize its own ministries and specialized agencies to ensure that decisionmaking is effective. The multiplicity of government bodies involved in public enterprises has frequently led to confusion, duplication, and excessive control. Superimposed on this diffusion of responsibility is the tendency for public enterprises to suffer the extremes of political interference whenever the government changes.

One way to coordinate decisionmaking and to prevent excessive political interference is by establishing supervisory agencies of some kind. Such bodies can be thought of as "focal points": some perform the full ownership role, others are more limited. The functions of these units and examples are provided in table 6.

Focal points with supervisory functions can be useful in obtaining timely and relevant information on state industries, a prerequisite for

Table 6. *Focal Point Organizations*

Focal points with an ownership role

Responsibilities

- To establish and amend the charter of the enterprise
- To hire and fire the board of directors
- To approve annual accounts and dividend payments
- To hire auditors
- To monitor performance

Examples

Norway: Public Enterprise Unit in Ministry of Industry
Sweden: Unit Five in Ministry of Industry
Austria: Ministry of Public Enterprises
Italy: Ministry of State Participations
Canada: Overseeing Agency for Crown Corporations

Focal points with a supervisory or advisory role

Responsibilities

- To define financial and operational objectives
- To review multiannual plans and budgets
- To monitor performance on a monthly or quarterly basis
- To provide technical assistance and training

Examples

Brazil: Special Secretariat for the Control of State Enterprises (SEST)
within Ministry of Planning
India: Bureau of Public Enterprises (BPE)
Pakistan: Experts Advisory Cell (EAC) within the Ministry of Production
Israel: Government Company Authority (GCA) within the Ministry of Finance
Ghana: State Enterprise Commission (SEC)

assessing performance.⁷ One such has been SEST in Brazil. By having a clear role and objectives, it has shown how to improve the efficiency of public enterprises. In its six years of existence, SEST has increased their accountability without getting involved in day-to-day operations, even though some of its responsibilities (such as recommending ceilings and targets for certain categories of spending) could have led to excessive interference in the operational side of public enterprises. Through its monitoring of key economic variables, and with political support from the government, it has brought the priorities of all state industries more into line with the needs of the economy as a whole. Yet it has done so by focusing on broad aggregates and ensuring that they were achieved.

SEST's small (fewer than fifty professionals) but competent staff eschewed getting involved in the day-to-day affairs of the enterprises. Their tasks have been to

- recommend targets for all major categories of revenues and expenditures, foreign debt, imports, and fuel consumption of public enterprises
- recommend distribution of state industry profits and dividends
- recommend new equity capital increases for public enterprises
- recommend the creation and acquisition of new companies, as well as the liquidation and divestiture of old ones.

Their recommendations are made directly to the president of the republic for final approval.

The contrast between SEST and SEC of Ghana is instructive. The precise role of SEC has never been clear, and its political support has been patchy. The agency's work is frustrated because the reports from public enterprises come in late, sometimes so late as to be virtually useless. Yet the managers of state industries consider the agency to be an unnecessary bottleneck in their operations.

While one main characteristic of state industry management is excessive government interference, it is equally common to find a lack of effective control, a situation that creates uncertainty, misunderstanding, and sometimes distrust—and that frequently ends up in excessive interference. The dual purpose of supervisory agencies is therefore both to protect the directors and management from undue political maneuvering and also to exercise effective control over a limited number of variables.

Evidence from the sample countries shows that it is desirable to give supervisory agencies some elements of the ownership role as well as their supervisory functions. This is done in Austria, Italy, Norway, and Sweden. In Brazil, the success of SEST depends partly on the fact that it has been granted several powers that normally belong to the ownership role. There are strong reasons for requiring that a supervisory agency

report not just to a single ministry. The agency might be responsible to an intersectoral committee, for example, or operate as a quasi-governmental unit, or be attached to the office of the prime minister or president. Such arrangements give the agency greater status and ensure that it does not become beholden to the narrow views of a single ministry.

Establishing an institutional and policy framework that is conducive to good performance by state industries is a challenging task. Arrangements will of course vary among countries depending on factors such as the level of economic development, the availability of free markets, and the political philosophy. In essence, however, this article has proposed a framework that stresses the decentralization of decisionmaking to the directors and management, and the strengthening of their capabilities. It has not attempted to quantify the benefits of this approach. But it has provided compelling examples of how the performance of state industries varies widely, with the variations often being attributable to the way the industries are organized and run.

Abstract

This study identifies the factors that influence the performance of state industries. Based on a review of thirteen countries, the authors isolate three qualities in the business and managerial environment that distinguish successful public enterprises from the others. These are (a) the degree of competition that public enterprises are exposed to; (b) the degree of financial autonomy and accountability under which public enterprises operate; and (c) the extent and manner in which managerial autonomy and accountability are ensured. It is impossible, and perhaps misleading, to assess statistically the importance of each of these factors. Where all three exist, however, the performance of public enterprises is significantly better than in those cases where most or all of these factors are absent.

Notes

This article is a summary of a more detailed study by the authors (Ayub and Hegstad 1986). The background material for that study comprised thirteen country case studies of public enterprise sectors. The countries included were Austria, Brazil, France, Ghana, India, Israel, Italy, Norway, Pakistan, Portugal, Sweden, Tunisia, and Zambia. The authors are grateful to many readers for helpful comments but especially to Kemal Dervis, Leroy Jones, Harinder Kohli, Anne Milne, Mary Shirley, and Anil Sood.

1. The correlation coefficients of per capita GDP with the shares of public industrial enterprises in industrial and total GDP were only 0.05 and 0.03, respectively. Kendall's rank coefficients were, respectively, 0.14 and 0.39 (a zero value signifies a random pattern and 1.00 indicates exactly similar rank orders), results that are only significant at 1 percent and 10 percent levels of confidence, respectively.

2. While high capital intensity is characteristic of the public enterprise sectors in most sample countries, it is particularly marked in Ghana. Two sugar factories and a state footwear factory installed conveyors to undertake tasks that are not even mechanized in the United States (Killick 1983).

3. The data refer to the public industrial enterprises under the jurisdiction of the Ministry of Production, which account for most of public industrial value added and employment.

4. In some cases, of course, the external borrowing of public enterprises was not

voluntary but forced on them by governments that used the creditworthiness of these enterprises to contract external loans.

5. This approach was recommended by the Nora Report in France. See Groupe de Travail de Comité Interministeriel des Entreprises Publiques (1969).

6. While it is difficult to observe a causal relationship between private participation in public companies and their performance, many observers believe that the professional competence of the experienced private sector individuals on the board of the Swedish steel holding company, SSAB, has contributed significantly to its successful restructuring to date.

7. For example, prior to the establishment of SEST in Brazil in 1979, even information on the number of public enterprises in existence was not readily available.

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- Ayub, Mahmood A., and Sven O. Hegstad. 1986. "Public Industrial Enterprises: Determinants of Performance." World Bank Industry and Finance Series 17. Washington, D.C.
- Diskin, Ehud. 1980. "Attitude toward Risk in Israeli Private and Public Enterprises." Ph.D. dissertation. Jerusalem: Hebrew University.
- Groupe de Travail de Comité Interministeriel des Entreprises Publiques. 1969. *Rapport sur les Entreprises Publiques*. Paris: Documentation Française.
- Gupta, M. 1982. "Productivity Performance of the Public and the Private Sectors in India: A Case Study of the Fertilizer Industry." *Indian Economic Review* 17, no. 2.
- Jones, Leroy. 1983. "The Linkage between Objectives and Control Mechanisms in the Public Manufacturing Sector." In United Nations Industrial Development Organization (UNIDO). *The Changing Role of the Public Industrial Sector in Development*. Vienna.
- Killick, Tony. 1983. "The Role and Performance of the Public Sector in the Industrialization of Some African Developing Countries: An In-Depth Assessment." In UNIDO. *The Changing Role of the Public Industrial Sector in Development*. Vienna.
- Peters, Thomas J., and Robert H. Waterman, Jr. 1982. *In Search of Excellence*. New York: Harper and Row.
- Sheahan, John B. 1976. "Public Enterprise in Developing Countries." In William G. Shepherd, ed. *Public Enterprise: Economic Analysis of Theory and Practice*. New York: Lexington Books.
- Shirley, Mary. 1983. *Managing State-Owned Enterprises*. World Bank Staff Working Paper 577. Washington, D.C.
- Sri Ram, V., and others. 1976. *Performance of Public Sector Undertakings*. New Delhi: Economic and Scientific Research Foundation.

References

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