Chapter 5

Allocative Efficiency

The effects of exchange control regimes on efficiency within a developing country can be analyzed at several levels. In this chapter, we focus essentially on the so-called static efficiency effects—for example, the effects on the allocation of investments among alternative activities,[1] on utilization of capacity, on holdings of inventories, and so on—while deferring to later chapters the consideration of effects on domestic saving and capital formation, export performance, entrepreneurship, and innovation, which are considered to be the "dynamic" aspects of economic efficiency.

This division of efficiency effects, it can hardly be overemphasized, is both artificial and semantically loaded against the set of effects described as static and in favor of the effects termed dynamic. Thus, if the (static) efficiency of investment allocation drops so that the same inputs produce less output than is feasible, surely it will, *ceteris paribus,* reduce the growth of the economy.[2] The static effects of a foreign trade regime may thus impair the economy's growth far more effectively than the sum total of the dynamic effects. In fact, one of the significant conclusions of the Project, which will become evident to the reader in the following analysis, is that the static effects of exchange control regimes of Phase II variety seem to be generally adverse and significant whereas their dynamic effects, when decipherable from the complex evidence as significant, may be adverse and hence reinforcing in character rather than beneficial and offsetting to the static, adverse effects.

In this chapter, we first discuss at a very broad level (in Section 1) some evidence from countries in the Project regarding the productivity of investment during Phase II regimes and outside thereof. We next consider, more directly, for Phase II regimes (1) the possible malallocation of investment

among alternative activities using the estimates gathered on this question in the framework of domestic resource costs (DRCs) in most of the country studies (in Section II);[3] (2) the possible accentuation of underutilization of capacity (in Section III); (3) the possible impact on holding of increased inventories (in Section IV); and (4) the diverse effects on choice of techniques, and so on, due to the artificial cheapening of capital goods imports that typically obtains under exchange control regimes (in Section V).

I. SOME OVERALL INDICATORS

The simplest, but least reliable, method of establishing a link between the foreign trade regime and the economic efficiency of an economy is to examine indicators of "productivity" for possible association between levels, and turning points therein, and the state of the trade regime. For Ghana, Israel, and Chile, this has been attempted by the country authors, using different indicators, and drawing pointed attention to the inadequacy of such an approach. They also stress that its results are consistent with the hypothesis, based on *a priori* argumentation, that Phase II regimes, in generally leading to a disregard of opportunity costs in allocational decisions, should cause a decline in efficiency (in the manner discussed at length in the subsequent sections of this chapter).

Clark Leith, for Ghana, cites the fact that both investment and its productivity, as measured by the *marginal output-capital ratio*, declined sharply in the period following the exchange control restrictions since 1960 and 1961, in fact plummeting to very low levels in the late Nkrumah period and during the austerity of the early N.L.C. (National Liberation Council) government,[4] and beginning to recover only thereafter. *In itself*, of course, this broad level form of argument is not compelling. In particular, shifts in the marginal output-capital ratio may result from marked changes in the composition of output and may reflect exogenous factors such as large declines (or increases) in agricultural output around the trend. Nonetheless, Leith argues that it is suggestive of a possible relationship. He then develops arguments to show that the exchange control regime during the 1960s did produce specific inefficiencies.

For Israel, Michael Michaely, who can contrast a Phase IV period with Phase II, argues the many reasons why inefficiency and waste should be widespread when QRs are intensive and observes that a shift to price determination of imports would lead, at the time of the shift, to a particularly large increase in productivity because this waste would be reduced.[5] He then uses Kendrick-type estimates of overall factor productivity, based on Gaathon's earlier work, for the period 1951 to 1965, dividing the period into three subperiods: (1) 1951-1952, peak time of the QR system; (2) 1953-1955, the

main years of transition to price regulation; and (3) the following Phase IV years from 1956 to 1965. His conclusions from this evidence are that the data are in conformity with the postulated effect of QRs, namely, the rate of increase of productivity rose markedly from 1951-1952, the peak period of QRs, to 1953-1955, the period of rapid transition to the price mechanism as a means of regulating imports as well as other activities in the economy. For the economy as a whole (excluding housing and the public sector), the rate of increase of productivity was not as fast in the decade from 1956 to 1965 as in the transitional years, 1953-1955—though this is not true for the manufacturing sector, and it was faster than in the period of controls, 1951-1952. Michaely is, however, careful to argue that the causal connection between severe QRs and slow increase in productivity does not follow necessarily from their coexistence. This is especially because the Israeli economy during its earlier years underwent fast and radical changes in size and structure. In particular, the rapid increases in productivity in the first few years following 1951 could have occurred because "immigrants, who made up a large fraction of the population, may have been placed in jobs they were not suited to during the period of mass immigration, and later sought and found more appropriate occupations." For this and other reasons,

> productivity should have been expected to rise rapidly in the years 1953-1955 even without a change in the QR regime. Therefore it cannot be claimed that the whole of the rapid rise that actually took place in those years should be attributed to the change in the exchange system. Unfortunately, there is no feasible way of distinguishing the various factors that contributed to the increased productivity of that time. Thus, it may only be stated that the hypothesis that a shift from QRs to price regulation of the economy leads to faster growth through increased productivity is at least not contradicted by the facts of the Israeli experience.[6]

For Chile, Behrman has a detailed analysis of the relationship between liberalized and restrictive regimes, on the one hand, and the productivity of capital in the shape of the marginal output-capital ratio, on the other hand. He concludes that the degree of restrictionism has been inversely associated with such productivity, pointing *both* to efficiency-type effects of restrictionist trade regimes (e.g., the inability to import economical second-hand goods under restrictionist regimes, the possible increase in inventory holdings, and the shift to inefficient domestic equipment) *and* to compositional effects (e.g., shift of investment to sectors with higher capital intensity during restrictionist regimes).[7] On balance, Behrman's arguments and evidence imply that the (Phase II) restrictionist regimes reduced the marginal output-capital ratio and that this, in turn, did imply efficiency effects rather than purely compositional differences in the pattern of investments under Phase II and more liberalized regimes.

II. INTERACTIVITY ALLOCATION OF RESOURCES: DRCs ET AL.

There are several reasons to conclude that the exchange control regimes studied in the countries in the Project were ill-suited to the task of having the "true" costs and benefits reflected in economic decision-making as, for example, in regard to production, inventory-holding investment levels, and techniques in the economy. This is not to assert that, *in principle*, one cannot combine direct allocations (as in the operation of a QR regime) with an optimal allocation and utilization of resources. Rather the argument relates to the operation of the "visible hand" system, as typically observed in the developing countries examined.

The reader's assessment of the prospects of having a rational allocation and utilization of resources under exchange control regimes, however, is certain to be influenced by the evidence that we will discuss for these countries.

At the outset, it would be useful to keep two points in mind. First, the foreign trade regime in some cases—as in India and Pakistan in particular—was merely supportive, in the main, of the allocation of resources that was already decided upon *via* industrial targeting within the context of overall plans and which was buttressed by an elaborate industrial-licensing machinery. However, even in these countries, one can attribute more of a direct causal role to the foreign trade regime in influencing the pattern of investments. For example, in India, there was a growing small-scale sector that escaped industrial licensing and responded to market incentives, and additionally, there was much actual investment, even in the large-scale sector, that could not be targeted in sufficient detail in advance and which came up for licensing in response to market incentives, of course. Furthermore, while the foreign trade regime may have been supportive in regard to investment allocations, that feature certainly did not preclude the regime from having substantial effects in other areas of resource utilization, for example, on capacity utilization, inventory holdings, and so on.

Second, the evidence that we will present is not fully conclusive in each of its constituent elements. However, taken as a whole, it is very persuasive and supportive of the thesis that exchange control regimes of Phase II variety have adverse effects on the efficiency of the economic system. Thus, when we can show that the methods of allocation used by exchange control authorities systematically ignored economic costs and returns and when it is then shown that the returns on different activities that have emerged under this regime diverge greatly from one another, it would seem to be reasonable to conclude that the former has something to do with the latter. In the analysis that follows, however, we will be careful to spell out the caveats that must not be forgotten in reaching our conclusions as we work through each argument bearing on the matter at hand.

A. Evidence on Allocation Criteria

The task of securing information on the criteria used for the allocation of imports among alternative sectors and uses is not merely tedious but difficult and, at times, impossible because such information is often withheld from public scrutiny. The only countries in the Project for which such information and analysis are presented, in consequence, are India, Turkey, Chile, Egypt, and Colombia.[8] For the first two countries, detailed procedures of allocation are set out and analyzed while the Chilean and Egyptian accounts are somewhat more sketchy. The Colombian study focuses rather more on a "revealed preference" analysis of the actual awards of licenses with the aid of a sample survey.

The evidence on criteria of allocation from the Indian study is the most pointed on the issue of the meaningfulness of economic terms thereof. While the reader can do no better than turn to the original discussion by the authors of the Indian study, their central conclusions are worth noting here. Distinguishing between the criteria used to award import licenses for raw materials, for example, among industries and among firms within the industries, these authors were forced to the view regarding interindustrial allocations that the "problem was Orwellian; all industries had priority and how was each sponsoring authority to argue that some industries had more priority than others?"[9] The result was that the bureaucrats tried to hold the overall allocations confidential and fell back in the interest of safety and objectivity on criteria of "fairness," which typically implied allocations *pro rata* to capacity installed, or employment, or shares defined by past allocations, or similar rules of thumb. The allocations within industries, among alternative claimants, were even more evidently governed by equal-shares criteria, related to capacity installed (in the main). It is evident from their analysis that these criteria were *not* intended to create more efficiency. Rather, they created sheltered existence for the firms and for the industries by assuring them of guaranteed and "equal" access to the scarce imports fetching high premiums in most cases, quite regardless of the efficiency of the firms and the industries.

The allocation of capital goods imports, on the other hand, was subject to both industrial and import licensing in India. The expansion of capacity by industry was governed by the actual exercise of such licensing machinery as also by the overall sets of targets laid down in the five-year plans for most industries. However, the industrial composition of expanding capacity was governed by macro-economic models which could, for obvious reasons, not take into account the detailed costs and benefits at the micro-level. In essence, therefore, one has to conclude that the targeting of industrial expansion by fairly minute detail was of a nature that militated against the reflection of opportunity costs in investment allocation among alternative activities. Hence, in

principle the licensing of capital goods imports to buttress this pattern of industrial expansion was, in turn, counterproductive of economic efficiency.

The evidence on the allocation mechanism in Turkey, Chile, Egypt, and Colombia is not as detailed and focused on the meaningfulness of the criteria used as in the case of India. However, there is little about the allocation mechanism in these accounts of the import control regime that is more comforting. The only exception perhaps is the evidence produced by Krueger for Turkey that the import allocations by industry, once decided upon, were handled for interfirm allocations by the chambers of commerce. Perhaps this led to a more efficient intra-industrial allocation, but it could equally have led to an equal-shares approach among members for obvious reasons. The overall judgment of Krueger on the criteria again is that they did manage to ignore economic considerations, much as the Indian regime did, and that the inefficiencies she then documents are traceable to this neglect.

B. Evidence on Inefficient Allocation of Resources

The lack of economically meaningful criteria and the resort to practical rules of thumb—tempered, no doubt, by varying degrees of evasion (as discussed in Chapter 4)—imply a disregard of opportunity costs in the allocation of investable resources among alternative activities. In the immediately following analysis, we will discuss the evidence on such inefficiencies, postponing the discussion of the efficiency of factor use, *given* the investment pattern, to later analysis.

The marshalling of evidence on the misallocation of resources implied by exchange control regimes, as just described, requires the specification of a precise analytical framework plus measures of misallocation derived therein. While, in principle, such an analysis would require a general equilibrium model, with an explicit social utility function and information on the foreign trade elasticities for all tradeable commodities and on factor supplies and the production functions for all activities, plus knowledge of all the distortions in the system other than those resulting from the exchange control regime, such a task is clearly next to impossible to accomplish satisfactorily even if the resources for such an ambitious exercise were to be found.[10] In place thereof, we have resorted to a technique that the country authors recognize clearly as rather simple (and perhaps simplistic). The domestic resource costs (DRC) of earning a unit of foreign exchange in alternative activities have been computed, the analyst treating these costs as an approximate index of the differential returns that are being obtained from different activities, as observed at any point of time in the economy.

The DRC index, as applied in practice, measures the returns to domestic resources in foreign exchange by evaluating the tradeable inputs and outputs at international prices. In comparing any two DRCs for a pair of activities, then, we may argue that a marginal shift of domestic resources from the activity with higher DRC to the other would yield more value added at international prices with the input of domestic resources unchanged. Hence, the reallocation would be more efficient; or, in other words, the existing, initial allocation with differential DRCs in the two activities is inefficient.

This argument is clearly based on the main insight of static trade theory—that international prices, for a small country, represent opportunity costs. It also presupposes that the domestic resource costs should be measured at their "shadow" prices if there are distortions in the economy.[11] Hence, the analyst should work out the appropriate shadow prices of capital, labor, foreign exchange, and so on, that are to be used in evaluating the domestic resources used in each activity. In fact, as is now well known, this is precisely what divides the measure of effective rate of protection (ERP) from the DRC concept for, in the absence of such shadow pricing, the two measures will generally reduce to equivalence.

However, in practice, the shadow prices are not easily estimated.[12] Furthermore, it must be recognized that the demonstration of wide differentials in DRCs among different activities is not equivalent to arguing that the losses therefrom must also be correspondingly large: (1) the shift of resources from a higher DRC activity to a lower DRC activity may run into increasing costs; and (2) the expansion of output in the lower DRC activity may run into reducing output prices (as, for example, exports are increased to clear the supplies). In general equilibrium analysis, moreover, we should be prepared for three complications. First, as resources are shifted from a number of activities to other activities, in a shift to optimal equilibrium (e.g., free trade for a small country), the associated shift of prices may imply that, at the changed techniques, an activity that was higher DRC than another in the suboptimal equilibrium may become lower DRC than the other in the optimal equilibrium. Second, evaluation of the activity at, say, c.i.f. international prices in the suboptimal equilibrium may have to give way to its evaluation at f.o.b. prices in the optimal equilibrium.[13] Third, the relative expansion and contraction of different activities in the optimal equilibrium as compared to the suboptimal equilibrium cannot be forecast in general from the mere examination of the relative DRCs in the initial suboptimal equilibrium, in consequence.

Having thus set out what we *cannot* infer from the DRCs estimated in the country studies, we should then assert that they do give a reasonable clue to the wide variations in the social returns to different activities in the system, as of any time. Also, given the lack of attention to prices and costs in the exchange control regimes in many of our countries, such differences could be taken as

evidence that these regimes have indeed brought about the inefficiencies that these variations in DRCs imply. However, even here we need to be somewhat cautious on both empirical and conceptual grounds. First, at the empirical level, only those economists who have tried to work with data on international prices will appreciate how difficult it is to estimate them meaningfully. In many exchange control regimes, which work with the principle of QR-conferred automatic protection, it is rather academic to interview traders and request reliable quotes on c.i.f. prices of comparable goods. The trade has been often eliminated too long for there to be anything but a "guesstimate" to be forthcoming at best. Second, as the pioneering work of Kravis and Lipsey has shown, the kind of input that is necessary to secure meaningful price quotations on imports of capital goods on a comparable basis for different sources (in this instance, between foreign sources and domestic production) is a conceptually tricky and statistically difficult exercise, lending itself to significant errors unless great care is exercised.[14] Third, the price quotations that may be obtained on actual imports are also subject to manipulation and deliberate error for the simple reason that the high premiums on imports are occasionally taken in undeclared income, a practice that certainly obtained in India and was possibly current in some of the other countries in the Project. In view of these difficulties in securing any, leave aside reliable, information on international prices from the market, the DRC calculations in some of the countries in the Project—Ghana and India being two major countries in this regard—had to rely on unit values plus premium estimates, each introducing degrees of error that are difficult to pinpoint with much accuracy. In assessing the DRC estimates in the various studies on which we report here, therefore, the reader should bear in mind that reading the fine print on the untidy methods used to derive the DRC estimates, appearing neatly in their tabulated form, is not merely a matter of scholarly curiosity but a useful corrective to the tendency to consider these estimates as yielding more than a rough-and-ready guide to differential returns among activities.[15]

Conceptually also there is need not to put too strong a weight on this kind of argumentation beyond the general inference of a broad pattern of misallocation of resources among different activities. Aside from the caveats already listed earlier—for example, that a shift to optimal equilibrium could well make an industry competitive and worthwhile with different techniques—we need to recognize that the view that all DRCs would be equalized in the absence of distortions, if only the foreign trade regime allowed international opportunity costs to be reflected in domestic decision-making, is not really convincing. This proposition is, after all, based on equilibrium theory. In practice, the economies with optimal policy frameworks (as defined from equilibrium theory) would experience disequlibrium and would be continuously adapting themselves to changing technological know-how, factor supply

changes, variations in international prices, and so on. The variations in DRCs that would be observed in any one cross section at a single point in time cannot therefore be meaningfully attributed to the inefficiencies in the trade regime. This would be "economic overkill" and would at least fail to persuade the more sophisticated among the proponents of restrictionist exchange control regimes.

While therefore all these caveats need to be definitely borne in mind and the reader has been fairly forewarned against easy and facile deductions from the evidence on DRC variations about to be produced from the countries in the Project, it does not seem to us to be unreasonable to assume that the process of freer competition for imports under a more liberalized trade regime than that characterizing the Phase II regimes in many of our countries during the bulk of the period studied would have served to bring pressure to bear in reducing the wide variations in DRCs both within and between industries.

The process of careful qualification and skepticism should not be carried too far. In this instance, we feel that the weight of the evidence, when we recognize the documented lack of economic criteria in QR allocations, is certainly to create more than a *prima facie* case against Phase II type exchange control regimes.

We therefore proceed now to put together the evidence on DRC variations in alternative activities that has been gathered for the countries in the Project. The estimates of DRCs, adjusted for shadow prices or unadjusted (in which case they are essentially linked to ERPs, as already noted), in the different studies in the Project are described in Table 5-1 so that the reader can use the table as a guide to the country analyses. However, a few observations are called for here.

The use of only unadjusted DRCs, that is, ERPs, in certain countries (i.e., Ghana and India) has been justified by some of these authors primarily in terms of the inability to spend the necessary recources to devise a suitable methodology for computing meaningfully the shadow prices for intermediates and primary factors that would need to be derived in the presence of imperfections such as quotas, factor market distortions, and so on. On the other hand, other authors (such as Krueger for Turkey) did use shadow prices. However, it must be admitted that generally these were not derived in the context of a well-specified model, so that they should be regarded essentially as "sensitivity" estimates.

Moreover, the estimates are, strictly speaking, not comparable across the countries in the Project. The lack of standardization of the activity groups as also of the concepts in this regard reflected an appreciation of the fact that data availability, especially the procurement of reliable estimates of international prices, varied greatly among countries. Thus, given the large number of analytically more interesting and novel issues raised by the Project, several

authors considered it undesirable to spend their limited time and resources on procuring such information at first hand, something that could at best have been attempted only in a rough-and-ready fashion in any event. Rather, most of them were willing to use such estimates of DRCs (and ERPs) as were already available in order to interpret them somewhat along the lines of the present discussion. Indeed, given the serious conceptual and empirical limitations already alluded to, attempts at manufacturing standardized DRC data for all the countries would have both been wasteful and lent a spurious sense of comparability to the resulting numbers.

Looking therefore at the adjusted and unadjusted DRC estimates, as described in Table 5-1 very summarily, and confining ourselves to a "structural" view of each country *taken by itself*, we note that there is indeed evidence of substantial interindustry variations in DRCs by different sectors. (For Egypt, this evidence obtains also within the agricultural sector, though we will say more on this presently since Hansen and Nashashibi do not rely exclusively on DRCs as an index of efficiency losses.)

Thus, for example, Krueger estimates intra-sector DRC variance for different industrial sectors in Turkey during 1968 and/or 1969 at values ranging from 6.26 for cement up to 278.88 for transport equipment and 890.49 for rubber products.[16] She concludes, in light of this evidence, that the "wide variation in DRCs on the import-substitution side is indicative of the degree to which encouragement of import-substitution has been indiscriminate."[17] Similar conclusions have been reached in other studies, including principally India and Ghana.

Recall, however, that inferences of "large" welfare losses from large variations in DRCs between industries are not persuasive in the face of such objections as: What would one do with the increased output from the expansion of the low-DRC industries? or, The factors utilized in one industry may be highly specific to that industry so that there may be rapidly increasing costs to expansion of outputs in the low-DRC activities. These objections however lose much of their force if the DRCs among alternative firms *within* the same industry show wide variations under Phase II type regimes. Evidence at this "micro" level is available from some of the Project studies. It is noteworthy that in these studies the interfirm variations in DRCs were almost as large as the interindustrial variations in DRCs[18] so that there is no easy way out of the conclusion that the pattern of investment allocations was less than optimal.

Next, while we have warned against making strong inferences from comparisons of dispersions in DRCs between countries, and possibly over time for the same country (given the relative unreliability of the underlying data), it is probably worth reporting that the South Korean study suggests somewhat low interindustrial ERPs dispersion during its Phase IV whereas the Indian study suggests that the dispersion may have fallen slightly soon after the Phase III episode in 1966.[19]

Table 5-1. Summary Information on DRCs and ERPs in Country Studies

Country	*Measure used: ERPs; DRCs*	*Period*	*Nature of Period*	*Sectors Used*	*Methodological Remarks*	*Other Remarks*
Chile	ERPs	1967	1961: Phase IV	92 sectors		
	ERP's DRC's	1961, 1967, 1968	1967 1968 Phase III	28 sectors		
	DRCs					
Colombia	ERPs	1969	Phase IV	29 groups of traded sectors, including primary products	Reliance principally on comparisons of domestic prices with export prices; non-traded inputs evaluated by both Balassa and Corden methods	"Large variance in the protection received by different sectors" (p. 226)
Egypt	DRCs (1)	1961, 1963, 1964		Agriculture		
	(2)	Before and after 1962	1962 devaluation	Selected manufacturing industries (cement, fertilizers, sugar, tires and tubes cotton textiles)		
	(3)	Various additional dates: 1954, 1957, 1969-1970		Ten industries: Above industries plus automobiles, paper, and iron and steel		

Egypt	ERPs (1)	1961, 1963, 1964		Agriculture		
	(2)	Same dates as DRCs above		Ten industries, as above		
Ghana	ERPs	1968 and 1970	Initiation of Phase IV	Industries from CBS Industrial Survey Classification	(1) Protection broken down by QRs and by Tariffs and Surcharges (including indirect taxes) (2) Nominal protection also available by some sectors	(1) A few cases of negative value added at world prices (2) Some cases where tariff was not redundant because of QRs (3)"Substantive and apparently random variation" in protection between industries and also at establishment level (p. 76)
	DRCs	Mid-1967 through mid-1968	End of Phase III and initiation of Phase IV	Sample of 41 manufacturing establishments		Wide variation in DRCs among different establishments
India	DRCs and ERPs	1963-1965 and 1968-1969	Phase II and relapse from Phase III into Phase II, respectively	(1) 69 industries (2) Also, aggregated by broad groups: consumer, intermediate, and capital goods, for 1968-1969 only	No adjustment made in DRCs for shadow factor prices; therefore the ERPs and DRCs are strictly related, as explained in text.	(1) Wide variation in DRCs and ERPs among different activities (2) ERPs lowest for primary consumer goods and highest for non-food consumer goods.

Table 5-1 continued

Country	*Measure used: ERPs: DRCs*	*Period*	*Nature of Period*	*Sectors Used*	*Methodological Remarks*	*Other Remarks*
Israel	ERPs (1)	1956, 1957, 1958, 1959, 1960	Early part of Phase IV	80 industries	Computed for exporting and for import substitution; 1958 input-output coefficients used; effects of QRs were ignored	Variance was much higher for import substitutes than for exports (p. 101)
	(2)	1965	Later part of Phase IV	6 major industrial sectors	Domestic and foreign distinguished	
	"DRCs" and ERPs	1968	Phase IV; almost leading into Phase V	Textile industry	"DRCs" are basically ERPs adjusted for QRs and other restrictive measures not taken into account in ERP derivation; shadow prices *not* used	
Philippines	ERPs (1)	1965	Phase IV, close to Phase V	48 industrial categories	Estimates include effects of discriminatory sales or compensating tax but not of the margin fee on foreign exchange, the special import tax or the margin requirements for letters of credit	Some negative ERPs; disadvantageous position of exporting industries

	(2)	1949-1971	Varying Phases	Broad categories: imports (broken down by consumer goods, producer goods, etc.) and exports	Estimates include effects of several non-tariff measures; estimation less careful than for 1965 estimates	Biases against exporting and essential goods industries
South Korea	ERPs	1968	Phase IV; following a mild tariff liberalization in 1967	Export and import-competing industries split into 11 sectors each; averages for these broad groups also	Both Corden and Balassa methods used for treating non-traded inputs; effects of quotas included *via* use of price comparisons but appear to be quantitatively unimportant (p. 195)	Variability in ERPs for different activities considered to be relatively low; variability for ERPs higher than for nominal protection; discrimination against exports minimal
Turkey	DRCs	Late 1960s, from 1965 to 1969, as available	Phase II	16 industrial sectors, with several product and establishment breakdowns	1965 and 1969 data were adjusted by using a shadow price for capital of 20 percent and also by assuming that all excess capacity had been eliminated	(1) Some examples of value subtracted at world prices (2) Wide variability in DRCs among and within industries

Sources: *Chile,* op. cit., pp. 138 and 325-329. *Colombia,* op. cit., pp. 225-233; based on T. Hutcheson's estimates. *Egypt,* op. cit., pp. 93, 100, 310-311. *Ghana,* op. cit., pp. 58-80; DRCs based on W.F. Steel's estimates. *India,* op. cit.; calculations made by V.R. Panchamukhi; pp. 179, 184. *Israel,* op. cit., pp. 91-104 and Appendix B. *Philippines,* op. cit., pp. 104-108; original 1965 estimates are by John Power; original 1949-1971 estimates are by Valdepenas. *South Korea,* op. cit., pp. 195-200. *Turkey,* op. cit., pp. 218-226.

Note next that the Egypt study additionally attempted to estimate, by fitting agricultural acreage response functions, the *actual* shifts in acreage that resulted from the distortions in *prices* away from international prices and from *quantitative* acreage restrictions, which were also practiced in the Egyptian case.[20] Hansen and Nashashibi could not estimate input-coefficient changes under their alternative assumptions and settled for estimating acreage allocations to different crops under three alternative conditions: (1) actual domestic prices and actual (short-term) response functions; (2) actual international prices and actual (short-term) response functions; and (3) actual international prices and hypothetical instantaneous long-term adjustment.[21] Using prediction (3) as an approximation to optimal allocation of land, they compared it with the actual allocation and used the difference A, column 4 in Table 5-2, as an indicator of misallocation due to *overall* price and quantity distortions. Comparing it, however, with prediction (1) yielded B, column 5, in Table 5-2. This was interpreted as a measure of the misallocation due to price distortions (*plus* market imperfections implying only short-term response/adjustment). Finally, a comparison of predictions (1) and (2) yielded C, column 6 in Table 5-2. This was interpreted as a measure of the short-term misallocation due to price distortions alone.

The Hansen-Nashashibi conclusions, based on these estimates plus estimates of DRCs and ERPs, are particularly interesting in their implication in this instance for the use of ERPs (and DRCs) for inferring the *direction* of misallocation of resources (a matter to which we turn more directly in the next subsection):[22]

> . . . there is no perfect rank correlation between ERP and DRC: nontraded outputs and inputs are included, and the DRCs are calculated on the basis of imputed factor prices to adjust for government controls over land rentals and to allow for normal profits on capital. It is also recalled that what disturbs the rank correlation between *A*, on the one hand, and *B* and *C*, on the other, is direct government interference with acreages, as well as random disturbances, while the lack of perfect correlation between *B* and *C* expresses differences between short- and long-term misallocation of land.
>
> As is to be expected, neither ERP nor DRC can be used as an indicator of the long-term misallocations related to both price distortion and direct acreage interference (including random disturbances). The correlation coefficients ERP-*A* and DRC-*A* are insignificant and very low in the latter case.
>
> The ERP could, however, be taken as a relatively reliable indicator of long-term and a weak indicator of short-term misallocation resulting from price distortions alone. The correlation coefficient ERP-*B* is significant at the 1 percent level, and that of ERP-*C*, at the 5 percent level.
>
> The DRC, finally, can be used as a weak indicator of long-term misallocation stemming from price distortion, with the correlation coefficient DRC-*B* significant at the 5 percent level.

Table 5-2. Ranking of Crops in 1963 According to ERP, DRC, and Alternative Measures of Acreage Misallocation: Egypt

	Rank in Decreasing Order				
Crop *(1)*	*ERP*[a] *(2)*	*DRC*[a,b] *(3)*	*A (Actual area – Prediction 3)/ Prediction 3*[c] *(4)*	*B (Prediction 1 – Prediction 3)/ Prediction 3*[c] *(5)*	*C (Prediction 1 – Prediction 2)/ Prediction 2*[c] *(6)*
Cotton	7	7	9	6	8
Rice	9	8	8	10	10
Corn	3	5	7	5	7
Millet	4-5	2	5	8	6
Wheat	6	3	10	4	5
Barley	4-5	4	4	3	4
Onions	8	10	2	7	9
Beans	1	1	1	1	1
Lentils	2	6	3	2	2
Cane	10	9	6	9	3

Note: Spearman's rank correlation coefficient works out as follows, with critical levels at 1 percent and 5 percent probability at 0.76 and 0.56, respectively:

ERP-DRC	0.75	ERP-C	0.57
ERP-A	0.45	DRC-C	0.50
DRC-A	0.10	A-B	0.41
ERP-B	0.84	B-C	0.67
DRC-B	0.59	A-C	0.45

[a]According to Table 7-1.

[b]DRC includes trade and transport margin.

[c]Predictions 1, 2, and 3 are explained in the text.

Source: *Egypt*, op. cit., Table 7-5, p. 189.

In conclusion of this subsection, note finally that, in the analysis so far, we have considered interindustrial variations in DRCs, thus essentially discussing the *pattern* of import substitution. Only in Chapter 7, where we discuss export performance, will we discuss the problem of the differential incentives against exports and in favor of production for the home market, that is, the problem of the *degree* of import substitution.[23]

C. Protective Structure and Industrial Expansion

Before we proceed to an examination of the other inefficiencies traceable to the exchange control regimes, we may digress briefly on the question, perhaps inevitable, whether there is any discernible relationship between the protective structure in the countries in the Project and the growth of specific industries.

It seems tempting to argue that industries when arrayed in descending order by their protective rates should also correspondingly be ranked in descending order by their growth rates or their import substitution ratios. In fact, there is some analysis in the Project studies, and elsewhere, of correlational type between the structure of protection by nominal or effective measure and indices such as growth rates or import substitution ratios, though the evidence seems to be very mixed.

Thus, Carlos Díaz-Alejandro reports on the earlier work of Hutcheson on Colombian protection that regresses growth rates successfully on effective protective rates[24] (using the Balassa method for treating non-traded goods as enjoying zero protection rather than as value-added a la Corden, although the two methods have a different analytical basis).[25] Similarly, Frank and others report on rank correlation coefficients between various measures of effective protection, and of effective "incentives" (defined so as to include the effects of tax rebates, credit preferences, and such incentives) and resource allocational indices such as import substitution ratios (or export shares for export industries) and "growth contribution."[26] Their results however are generally poor on the import side." Since the correlation between the share of imports in total supply and effective incentives is significant and positive, it suggests that import substitution had progressed the *least* in these sectors where the level of effective incentives to domestic sales was high and the "correlations between effective incentives to domestic sales and growth contributions are not significant, though they are negative."[27]

Additional cross-sectional analysis of this variety was also conducted for Chile by Jere Behrman to determine if "the price structures created by the international economic regimes were associated with growth across sectors."[28] He found a positive relation between growth in value added and in horsepower capacity between 1961 and 1967 and the *implicit* tariff rates (ITRs) for 1967 and also for the incremental ITRs between 1961 and 1967. But this relationship has little plausibility, as Behrman notes, and may be rationalized only by argument such as that the ITRs "perhaps . . . served as signals, however, of the government's intentions to favor particular sub-sectors."[29] Interestingly, Behrman found no evidence for a link between effective rates of protection and growth. In fact, the only significant non-zero correlation coefficient, using alternative estimates, was a negative one between effective rates and growth in production from 1953 to 1961.[30]

Going beyond the country studies in the Project, however, we may note two successful sets of regressions, one for Pakistan by Guisinger[31] and one for Nigeria by Oyejide.[32] The Pakistani analysis was unsuccessful for import substitution ratios but successful for growth rates for a twenty-three-industry study. The Nigerian analysis, for forty-two industries, resulted in successful regressions of import substitution ratios on effective rates of protection and changes therein.

While therefore the results for the different countries are fairly mixed, we also need to note that the construction of a *theoretical* rationale for a successful regression of import substitution ratios or growth rates in cross-section analysis is difficult and one many *reasonably* expect to find no relationships of the kinds postulated. It should be useful to the reader to spell out why this is so, taking the import substitution ratio as the dependent variable and effective tariffs as the independent variable.

1. First of all, since effective tariffs are the independent variable, a basic difficulty follows. The effect on the import-substitution (production to total supply) ratio is *not* uniquely determined by the effective tariff. The same effective tariff is compatible with different combinations of nominal tariffs on output and inputs and hence with different effects on production and consumption of the output. Hence, even if the partial-equilibrium supply and demand curves were identical across the industries, the relationship hypothesized would not follow unless the input-output structure and the structure of nominal tariffs on each industry's outputs and inputs were identical.

2. In general equilibrium analysis, furthermore, the hypothesis runs into trouble for the further reason that the theory of general equilibrium tells us unhappily that, in an n-output ($n>2$) economy, if more than one price changes, the direction of output changes cannot be predicted (qualitatively, in Samuelson's sense). One really has to work out the full general equilibrium solution.[33] This nihilistic conclusion carries over, of course, to a general equilibrium model with imported inputs as well.[34]

3. Finally, while the analytical points made above relate to the effects of the tariffs vis-à-vis the free trade situation with given resources, the exercises testing the postulated hypothesis relate often to a situation of *growing* resources. But, in this event, there is even less presumption theoretically in support of the hypothesis. Take a simple two-sector example, using the standard 2×2 model of trade theory. We know from Rybczynski's theorem that the supply curves of the two commodities will shift differentially rather than identically, so that even if the supply curves were identical in the initial situation across activities, they would cease to be so with economic expansion (unless all factors expanded uniformly). And hence any effect of the tariff structure on the import-substitution ratio would be "muddied" by this additional growth effect. This is clearly a pertinent point when one is relating the import ratios for 1967, for example, to effective protection in 1962 (as in the Nigerian exercise), a period over which the capital stock may have increased by nearly 30 percent (assuming a capital-output ratio of 3 : 1 and an average savings rate of 15 percent of GNP), and hence certainly in excess of the labor force.

Thus, even within the confines of our neoclassical economic theory, one would have difficulties with the hypothesis that higher effective tariffs lead to higher import-substitution ratios on a cross-sectional basis. In the context of

actual LDC economies, these difficulties are accentuated indeed. The growth of industries is likely to reflect distortions arising from differential trade and domestic taxes and subsidies, industrial licensing and targeting, anticipation of tariff protection (as distinct from initial protection) once the industry has built up to size leading to an effective political pressure group, and so on.[35]

In addition, there are several major difficulties *specific to exchange control regimes* where QRs typically may dominate tariffs (as discussed for the countries in our Project in Chapter 2), with the notion that *observed* protective structures will tell the analyst anything conclusive about growth incentives. This is a most important and insufficiently appreciated point and the supporting reasons therefore need to be spelled out:

1. The translation of import premiums into implicit tariffs implies that one can treat tariffs and quotas as equivalent. This proposition is increasingly called into question. As noted in Chapter 2, non-equivalence will arise particularly under the presence of monopoly elements (not entirely absent from the scene in some of the countries in the project) and uncertainty (which is, of course, a fact of life).[36]

2. The import premiums are likely, except when entry domestically is totally free, to include elements of rent reflecting artificially controlled entry.[37] This is particularly true of countries with explicit industrial licensing (i.e., India, Pakistan) but also, in lesser degree, of the larger group of countries with QRs on capital goods imports (e.g., Ghana, Colombia, Turkey, and Egypt). Moreover, the problem arises partly also from QR-controlled access to imports of necessary raw materials. Unless entry enables a firm to get access to such imports, the absence of industrial or capital-goods-imports licensing will not be enough to get a truly free-entry situation. Thus the presence of licensing of imports of raw materials can, and does, serve to create rents that must be reflected in the premiums on imported inputs.

3. The fluctuations in the import premiums, which are evident in some of the countries, also make it somewhat meaningless to attach value to the cross-sectional translation thereof into one "incentives-determining" picture of the implicit tariff structure. Few of the entrepreneurs in an exchange control regime are likely to be ignorant of the fact of changes in incentives inherent in changing premiums, a fact that presumably accounts for the phenomenon of some industries actually going through the protective tariff-making process to have more secure, minimum protection conferred on them by tariff commissions and boards.[38]

4. Finally, we have already noted (in Chapter 2) that the Phase II type regimes in most countries operated with rules of "automaticity" in protection. QRs were used to grant protection as soon as domestic production was started. Once this "institutional" feature of the system is taken into account, it is easy to see that any *observed* (implicit) tariff structure fails to incorporate the in-

centive effects of guaranteed, "potential" tariff protection, which is clearly a significant factor on the scene. Thus, the incentive effects on resource allocation of an array of *n* observed (implicit) tariffs are surely not identical with the incentive effects of *n* observed tariffs plus *m* expected tariffs. This difference is further accentuated still when one must reckon with the fact that the *m* expected tariffs are not expected with certainty on their specific values but will depend on the precise extent to which the exchange control authorities would curtail imports in the face of domestic production.

It is for this set of reasons that the notion of relating tariffs, effective or nominal, to the pattern of industrial expansion—no matter how measured—may be lacking in sufficient rationale for countries in Phase II type exchange control regimes, as indeed our countries have been for the bulk of the period studied. This may well account for the mixed nature of the statistical results from various sources reported earlier in this subsection.

On balance therefore we are content to take the view, admittedly less ambitious, that the differential ERPs among different activities should be taken merely to indicate, *very broadly indeed*, the differential nature of the incentives that exchange control regimes tend to generate. This conclusion, in itself, is sufficiently interesting and important.[39]

III. UNDERUTILIZATION OF CAPACITY

We may now turn to the impact that the Phase II type exchange control regimes, heavily reliant on QRs, had on the returns from given investments, as distinct from the inefficiencies resulting from misallocation of investments. One of the major ways in which inefficiencies can arise is through the creation of excess capacity, which might have been avoided under a more liberal regime. There are several ways in which such a causal link between exchange control regimes and the presence of excess capacity can be established. We will detail these first and then consider the evidence for the countries in the Project in this regard so that some orders of magnitude can be indicated on the importance of such effects. Four types of such linkages may be spelled out.[40]

A. Incentives to Create Excess Capacity

The tendency to relate equity in allocations of licenses for imported inputs (directly to producers) to installed capacity should lead to an incentive to create capacity by linking the availability of premium-fetching imports with creation of more capacity. Thus, an entrepreneur, with given capacity, which was underutilized through lack of imported inputs, would not be able to ex-

pand output through additional utilization of capacity even if it were potentially profitable to do so. The only way he could respond to the profitability of the industry would be by getting more capacity installed and having some import quota allotted to him on basis thereof. But even if the entrepreneur could be allowed access to more imports at market prices,[41] so that this entrepreneur could expand utilization of existing capacity, the fact that he would have to purchase inputs at import-premium-inclusive market prices in order to do this, whereas expansion of capacity would enable him to expand output by access to premium-exclusive import allocations, would certainly bias his choice between these two courses of action toward more capacity creation.[42]

2. In addition to this effect of the methods of licensing intermediates and capital goods, there is another mechanism by which excess capacity could be accentuated in the system *via* the import-licensing mechanism. In an economic regime where the efficient firms can bid intermediates from the market away from the inefficient firms, the former will achieve greater utilization of their capacity whereas the latter will be forced out. This process, which is also efficient because all capacity is not desirable capacity and undesirable capacity must be scrapped to avoid larger losses, must necessarily lead to higher overall rates of capacity utilization than in a regime where inefficient firms automatically get "squatters' rights" to allocations of imported inputs.

3. An additional way in which the QR regime can affect capacity utilization is clearly *via* the bottlenecks it creates. Undoubtedly, bottlenecks would arise in *any* regime; but the ability to correct them is surely constrained for a number of firms by the difficulty with which remedial imports can be effected. And this difficulty varies of course with the degree of restrictiveness on the transferability of import licenses between commodities, firms, and sources. These bottlenecks add to excess capacity in two ways: (1) by preventing speedy availability of inputs into a process; and (2) by holding up the importation of critical spares and balancing equipment that would enable the existing capacity to be exploited more effectively. The former set of bottlenecks come from the restrictions built into the inputs-licensing system; the latter relate to both capital goods and industrial licensing procedures.

4. Yet another way in which the exchange control regime can affect capacity utilization is by inhibiting the employment of excess capacity for export markets. While, as we will argue presently, there is evidence that firms with substantial excess capacity can manage to improve capacity utilization through exports after liberalization policy changes, we will also note there that the export effort can be badly compromised, not merely by overvaluation of the domestic currency but also by the inability of the firms to exploit the intended liberalization of imports meaningfully. Severe restrictions on transfers of licenses and on permissible imports can prevent quick adjustments in production and capacity to respond to international orders. The substantial in-

flexibility of the import control regime can make it difficult for firms, when presented with export opportunities to reduce capacity underutilization at low marginal costs, to exploit these opportunities. If we are to reckon the full impact on capacity utilization from this cause, we should take the primary effect just discussed and add to it also the secondary effect that is implied by the fact that additional export earnings would ease the import situation and make more raw material imports available for further capacity utilization.

B. Evidence on Capacity Utilization

The evidence for these types of adverse effects of the import licensing mechanisms on the utilization of capacity in the country studies is mostly indirect. It consists of documentation of the allocation procedures and their likely impact, with some econometric evidence relating these institutional cum a priori arguments with excess capacity estimates. The major problem is the lack of reliable and conceptually clear data on capacity utilization. It is perhaps pertinent to note that, among the main reasons for the lack of reliable data on capacity, is the fact that these data are used for allocating premium-fetching licenses for (domestic and) imported materials on a *pro rata* basis, so that the governmental agencies maintaining the capacity data (as does the Directorate General of Technical Development in India) try to prevent upward revision of capacity data by firms whereas the firms try to do exactly the opposite. The final outcome depends partly or wholly on the relative ability of the two parties to offer and accept unlawful emoluments. Thus, ironically, here as in other areas, one of the casualties of exchange control systems is the ability to analyze the inefficiencies of such systems!

Such evidence and argumentation as there is for the countries in the Project relates to Turkey, India, Ghana, Colombia, Chile, and Pakistan. Of these, the Pakistan and Chilean analyses are perhaps the most comprehensive statistically so we may start with their results prior to a discussion of the other countries.

Gordon Winston has noted that, defining full capacity output as the single-shift maximum output, Pakistan had serious problems with capacity utilization in a number of industries.[43] Thus, in 1965 nearly half the industries worked at about half the capacity installed. Taking the average utilization rate for 1951-1966, nearly three-quarters of Pakistani industries had utilization rates below 60 percent of installed capacity, and nearly two-thirds had utilization rates below 40 percent. Winston sought to explain the capacity utilization rates cross sectionally by regressing these rates on a number of independent variables: ratio of exports to production (X), imports as a proportion of total supply (M), capital-income ratio (K/Y), average annual production per firm

(S), gross value added per man-hour (L), and number of firms in the industry (N). His result was as follows:

$$\begin{aligned} U = 29.26 &- 0.366M + 0.234X + 2.40(K/Y) + 0.937S \\ &(.069) \quad (.067) \quad (.871) \qquad (.296) \\ &+ 0.034N - 1.256L \\ &(.012) \quad (.704) \\ R^2 &= 0.90, \quad F = 20.5 \end{aligned} \tag{5.1}$$

This led him to conclude that utilization rates were positively related to exports (which increased demand), the capital-income ratio (because lower wages and low shift differentials in wages would lead to multiple shifts and hence to both power K/Y and U),[44] the number of firms in an industry (because a larger number stimulated competition and improved utilization rates),[45] and to size (because larger firms had economies of scale and political power to get more of the scarce inputs from the exchange control system). They were also negatively related to imports of competing products (because they competed with domestic production and/or may have encouraged investments in domestic capacity in the import-substituting climate of Pakistan), and to labor productivity (for the same reason as with the capital-income ratio).[46]

On working with the ratio of imported raw materials to total raw materials (RM), Winston found that:

$$\begin{aligned} U = 28.76 &+ 0.241X + 2.838(K/Y) + 0.024S - 0.267RM \\ &(.103) \quad (.957) \qquad (.012) \quad (.097) \\ R^2 &= 0.70, \quad F = 9.95 \end{aligned} \tag{5.2}$$

indicating that the utilization rate fell as the dependence on imported materials increased.

What do these regressions imply for the questions we have posed regarding the relationship of the exchange control regime to underutilization of capacity? Few of the independent variables here are really plausible, and RM (raw materials) would seem to be the most convincing since, given Pakistan's regime, the extent of capacity utilization may well vary with the availability of imported raw materials. And, similarly, it is plausible that export promotion should help to utilize excess capacity in import-substituting industries.

If therefore these latter results are accepted as indicative of plausible connections between the independent and the dependent variables, then Pakistan's exchange control regime may well be considered to have contributed to excess capacity. For it is difficult to expect that any significant ex-

cess capacity could have endured over time, with growing investments *in face of shortages of imported raw materials*, unless the exchange control regime made such growth in capacity worthwhile by linking it to guaranteed equal-shares access to imported raw materials fetching high premiums. Similarly, by inhibiting growth of exports—a question discussed in depth in the next chapter—the regime again would have inhibited the reduction of excess capacity, both directly and by making less foreign exchange available for imports of raw materials.

The analysis so far has underlined the argument that the exchange control regime in Pakistan, as elsewhere, itself created the incentives to add to capacity despite initial excess capacity. But we may ask the different question: Why did the authorities *permit* such growth of capacity to occur despite excess capacity when in fact investment and/or capital-goods import licensing could have been used to *prevent* such expansion? Nurul Islam[47] argues that new firms were licensed while existing firms operated with excess capacity on the doubtful assumption that increasing the number of firms necessarily increased the degree of competition. Another motivation was the desire for a wider distribution of entrepreneurship and industrial capital. Moreover, new capacity was sanctioned with an eye to future demand. He further notes that the composition of foreign aid in terms of project and commodity assistance also had its effect on the creation of capacity ahead of the generation of current resources for the utilization of capacity. It was difficult to reject project assistance for fear that aid, if not accepted, would be lost forever, and a poor country could ill afford to forego aid. Moreover, there was always hope that the installation of new capacity might eventually enlarge the flow of commodity aid to enable the utilization of excess capacity. Note, however, that the *willingness* of the government to expand capacity in the face of excess capacity would not be a sufficient condition for such expansion by the private sector. Hence the critical role in explaining such capacity expansion must be assigned to the exchange control framework that made such expansion profitable in the first place.

The Behrman analysis of capacity utilization in Chile is far more thorough and addressed to the following three questions: (1) are there Phase associations of capacity utilization? (2) have capacity utilization rates been sensitive to foreign sector changes on a partial equilibrium basis? (3) what is the nature of general equilibrium reponse of capacity utilization to changes in the international economic regime per se?[48]

On the phasewise association, Behrman concludes that such an association is not evident for the reason that the significant determinants of capacity utilization are domestic in nature. "Much of the importance of the foreign-sector in the determination of capacity utilization, moreover, has been due to wars and export market fluctuations. These phenomena are beyond Chilean control. They clearly are not caused by any changes Chile might make in her international economic policy regimes."[49]

In fact, Behrman's careful econometric, partial equilibrium analysis of the determinants of capacity utilization in eight sectors (agriculture, mining, construction, industry, transportation, utilities, housing, and services) during 1947-1965 shows strikingly the importance of several micro and macro domestic factors such as credit availability, relative output-input prices, and the state of economic activity in explaining underutilization of capacity. At the same time, the foreign sector factors of importance include the stringency of QRs. However, the signs of the coefficients in this factor go in both directions, indicating that the beneficial effect of reduced import-competing supplies on capacity utilization may or may not offset the adverse effect of reduced imports of intermediates, spare parts, and so on.

While therefore the Chilean partial equilibrium analysis seems to yield results that suggest a general lack of links between the exchange control policies and the rate of capacity utilization, we can argue (as we did in the case of the Pakistani analysis) that, *as between Phase II and Phase IV on a sustained basis*, the effect of Phase IV *via* improved foreign exchange availability *could* have been to *reduce* the capacity underutilization through increased availability of imported inputs for the industry and mining sectors. But, clearly, we cannot go beyond this for, as the Chilean analysis underlines, there are several other factors that significantly influence capacity utilization in the different sectors (including industry and mining). Moreover the improved availability of foreign exchange could have been used also to increase imports of *competing* products (a factor perhaps of some importance, as discussed above, in some cases in Behrman's analysis), thus *increasing* excess capacity.[50] It is perhaps useful to note also that, unlike in the Pakistani case for example, the Chilean procedures of import allocations do not appear to have created significant incentives to add to capacity in the face of excess capacity. Hence the effect of the exchange control regime on the emergence or accentuation of excess capacity (for several of the reasons discussed at the outset of this section) is likely to have been minimal and this may therefore also help partially to account for the general lack of any link between the Chilean phases and the capacity utilization rates.

Finally, we may note that Behrman's *short-run* general equilibrium simulation runs for devaluation and for equi-proportionate increase in imports through relaxed QRs yield the conclusion that capacity utilization through production change would *drop* from such policy changes. However, these results follow from macro price and income changes built into the model under the devaluation simulation and, in the QR-change simulation, from the fact that "the protective effects of quantitative restrictions on competing final goods apparently dominate effects on imported input supplies."[51] This set of short-run results however is of interest essentially in the analysis of the transition to Phase IV and does not bear directly on the issue whether, as between

Phase II and IV on a sustained basis, one may expect lower capacity utilization in Phase II for many of the reasons set out earlier.

The evidence for the other countries is more qualitative and, for some of them (e.g., Colombia and Turkey), the authors again assign only a rather modest magnitude to the effects under consideration. Thus, Carlos Díaz-Alejandro cites relatively high utilization rates in Colombia, compared to some other countries, and further argues that underutilization rates have been linked by other analysts to "long-term" factors such as management quality "which are influenced by trade policy only indirectly. Stop-go cycles related to the foreign exchange bottleneck have influenced capacity utilization, particularly during 1956 through 1967, and excess capacity in the 'horror stories' of import-substitution can also be found, but no strong general link appears to exist between import licensing as practiced in Colombia and excess capacity."[52] The link, weak as it is, can only be inferred from the fact that the willingness to add to capacity in the face of excess capacity would have been higher under the direct allocations of imported inputs by INCOMEX, much as in Pakistan and India, to Colombian firms on some fair-share basis. Also the underutilization of capacity, linked to a shortage of imported raw materials, provides empirical evidence in support of the pertinence of such an argument.

For India, the evidence of the links between the import control regime and underutilization of capacity is more considerable. This is *not* to say that the bulk of the substantial excess capacity in the Indian economy can be explained in this way. Recent micro-studies have highlighted the role of factors such as labor problems, mismanagement, and so on, in many industries. However, the institutional work on import allocation procedures, combined with interviews and examination of corporation reports, confirms the role of bottlenecks resulting in substantial shortfalls in production in different firms from time to time. Similar evidence on the inhibiting of exports by firms with underutilized capacity is also available. And, as with Pakistan and Colombia, the evidence of underutilization due to shortages of raw materials points to the importance of the argument that guaranteed access to fair shares in such raw materials imports, combined with sheltered markets for the output under the policy of automatic protection from imports *via* QRs, would make the expansion of capacity in the face of underutilized capacity more attractive than otherwise.

Thus, in regard to bottlenecks, it is clear that the Indian import control regime could not have been better designed for creating such bottlenecks! The AU (actual user) licenses (for raw materials and intermediates) were specified in great detail by composition and by source and were besides non-transferable between firms and, in principle, even between plants within a firm. There was no legal provision for resale of the AU imports either.[53] The creation of bottlenecks, with no legal redress, was thus almost guaranteed! Redress through appeals to the import control authorities was possible but time-consuming.

The normal, bureaucratic delays were compounded by the policy of using QRs to protect domestic producers that was embodied in the rather sacrosanct rule of "indigenous non-availability" as the critical factor in permitting imports. The resulting bottlenecks were, to some extent and only with lapse of time, eased by the growth of illegal resales of import licenses and imports and, with the growth of the export-promoting import entitlement schemes, by the imports legally made available thereunder.

The bottlenecks did not arise merely from the inflexibility endemic to AU licensing. The strict control over CG (capital goods) and industrial licensing also extended to regulating the composition and level of output by detailed specification. It was therefore not infrequent to find firms that could have technologically and profitably switched to new products, with capacity licensed for a different product, but were prevented from so doing by the rules of licensing. Nor was it infrequent to find firms with unbalanced equipment, seeking to add marginal equipment that could have multiplied output disproportionately, unable to secure permission to do so from the licensing authorities.[54]

The difficulties raised by the rule of indigenous non-availability extended also to exports. Thus, the effect of the 1966 liberalization policy package on exports by industries with excess capacity (and hence on their capacity utilization) was partly blunted by the inflexibilities of the control system. One of the important side effects of the principle of indigenous availability was that exportable items that therefore had to be manufactured with inferior-quality domestically produced inputs and capital equipment were, in turn, faced with enhanced difficulties in the highly competitive international markets. This was particularly the case with the new exports in the engineering industries, which in any case faced serious difficulties in cultivating foreign markets almost from scratch. Further, since there was little flexibility for getting more inputs through bidding in the market, in view of the restrictive character of the import policy, and capacity also could not be expanded (without prior licensing) owing to controls on entry, industries that needed flexibility in production in order to get hold of large foreign orders, whenever available, found themselves unnecessarily handicapped.[55]

There is some evidence on capacity underutilization in the Ghana study as well, but it is somewhat inconclusive. Leith does record the presence of excess capacity during the 1960s owing to shortages of imported raw materials and spare parts. This phenomenon was particularly acute during the late Nkrumah period, in 1964 and 1965, and after the coup as well. Thus, in setting out its plea for additional aid required for 1967, the NLC government put as its goal the attainment of "roughly some 50-55 percent of the theoretical 100 percent capacity on a one-shift basis." According to a study by Steel, interviews in 1968 of the forty-one manufacturing firms in his sample showed that capacity utilization rates for 1967-1968 ranged from 10 percent to 100 percent, with an

average of less than 50 percent. Leith's own data from the CBS 1968 Industrial Survey also showed a range of capacity utilization rates as broad as Steel's, with an unweighted mean of 57 percent and a standard deviation of 32 percent.[56]

Therefore there was indeed significant capacity underutilization in Ghana, and Leith records that shortages of imported inputs and spares were present. So we can infer reasonably that the exchange control regime must be assigned some role in the phenomenon of capacity underutilization. In particular, (1) increased exchange earnings would have increased imports of raw materials to improve capacity utilization; and (2) expansion of capacity in the face of underutilized capacity would have been less likely if the exchange control system had not effectively linked access to producer-licenses of scarce imports to capacity installed.[57]

Finally, Anne Krueger has also discussed the problem of excess capacity and the exchange control regime for Turkey. She notes for Turkey,[58] as other authors did for India and Pakistan, that "import licenses were allocated among industrialists on the basis of their capacity. Thus incentives were created by the import-licensing system to build additional capacity even if existing capacity was underutilized." At the same time, she records the Union of Chambers of Commerce data on capacity underutilization for 1966, 1967, and 1969, suggesting rather serious underutilization rates while also noting (as did the India study authors) that there was an incentive to overreport capacity to get more import allocations. Her conclusion, based on a detailed AID field study plus her own interviews with businessmen during these years, was to discount these high estimates and conclude, rather cautiously, that the "import regime led to some overbuilding of capacity and idle capacity in some heavily import dependent sectors" but that the magnitude of this phenomenon was not substantial.

In conclusion, it seems reasonable to argue that several specific aspects of the exchange control operation during Phase II, in some of the countries in the Project, created definite inducements to the creation or accentuation of excess capacity. However, we cannot really establish plausibly the magnitudes of these effects. Moreover, in many cases, there were enough other, purely domestic, factors that significantly influenced capacity utilization as well. Hence, even in the cases where Phase II procedures may be expected to have accentuated the creation of excess capacity, a time-series investigation of Phase II and others would not, and in fact does not (in Chile, for example), reveal any association between the phases and the rates of underutilization of capacity. The only important *statistical* link between Phase II regimes in general (as distinct from that resulting from allocational procedures of particular types encouraging excess capacity) and excess capacity that can be argued finally seems to come down to regressions of capacity utilization on in-

dices of dependence of the industry on imported raw materials. This enables us to argue that Phase II regimes, by adversely affecting the growth of export earnings (as discussed in Chapter 7), are likely to have consequently accentuated excess capacity in the industries using imported materials.

IV. EXCESS HOLDINGS OF INVENTORIES

The exchange control regimes can also be argued to have led to increased holdings of inventories of raw materials and intermediates, thus increasing the social cost of production beyond what it would otherwise have been. The basic argument centers on the fact that the exchange control regimes are characterized by frequent changes in the assignment of imports of specific commodities among different categories of restrictiveness and in the expected delays on grant and disposal of licenses, phenomena that *add* to the uncertainty inherent in the act of importation under any exchange regime. The *increased* uncertainty then leads to the holding of additional inventories to reduce the risk of losses from sudden bottlenecks in production.[59] In addition, there is the interesting argument that a general shift in import licensing from traders to industrialists—documented in Chapter 3 for many of our countries—also implied that there would be a general increase in inventories held as the economies of centralized holding by traders would be lost.[60]

The argument about individual firms holding increased inventories under exchange control regimes however relates strictly to the firms' *desire* to hold larger inventories. It may still be that the exchange control authorities may deny to the firms the ability to hold these inventories by refusing to allocate new import licenses unless the inventories are reduced. Hence any empirical examination of this thesis becomes tenuous and difficult.

The evidence on excess inventory costs, in the country studies in the Project, is mostly indirect—that is, citing the frequent changes in import policies and classifications—but there is *some* direct evidence of excess holdings.

The evidence of frequency of import policy changes for specific items is compelling for many countries. But the most detail will be found for Turkey and India.[61] There is ample documentation there of the transition of specific items from category to category (e.g., for Turkey, items moved from the liberalized list to quota list and back), of changing quantities of permissible imports (within the quota list), of the inclusion and withdrawal of the item under export-promotion licensing (e.g., under the import entitlement scheme, or the scheme for importing at international prices, in India), and so on.

As for the direct evidence on inventory holdings, there is some evidence, using international comparisons for similar industries, that suggests that there were unusually large inventory holdings in India,[62] though time-series analysis

on individual industries' inventory holdings has failed to show, so far at least, any relationship between the stringency of the QR regime and increased inventory holdings (presumably because stringency implies reduced imports and hence this tends to pull in the direction of reduced inventory holdings).

The international comparison route has been taken also by Anne Krueger for Turkey to supplement interviews. In particular, taking a sample of thirty-two Turkish firms' balance sheets, as of the close of each firm's 1969 fiscal year, she calculated the value of raw materials and other goods used in production, excluding semi-finished and finished products. The weighted average ratio of inventories of inputs to net fixed assets was then calculated as 0.4655, and the unweighted average at 0.5175, implying that inventory investment was approximately half as large as the investment in fixed assets. Comparisons with various countries tended to confirm impressions from the sample and from interviews. Table 5-3, utilizing data on national accounts, contains Krueger's estimates of the ratio of investment in inventory to fixed capital investment for a sample of countries (including Turkey). Turkish investment in stocks averaged 15 percent of investment in fixed capital, a ratio that was more than twice that of all countries in the sample except that of Japan and Spain. Krueger concluded that although this high Turkish ratio "cannot be attributed entirely to the trade regime (domestically produced goods were part of inventory accumulation, too) there can be little doubt that the import regime was a

Table 5-3. Ratio of Investment in Stocks to Fixed Investment, Various Countries, 1966 to 1968

Country	*Ratio*	*Country*	*Ratio*
Australia	0.080	Israel	0.030
Belgium	0.036	Italy	0.038
Brazil	0.074	Japan	0.135
Chile	0.081	Korea	0.060
Denmark	0.049	Netherlands	0.054
France	0.069	Spain	0.107
Germany	0.025	Turkey	0.152
Greece	0.021	United Kingdom	0.030
		United States	0.065

Note: a) Data for Brazil are for the 1965-1967 period.

b) These data cover *all* inventory investments in all sectors and are therefore not comparable with data from firms' balance sheets.

Source: SPO data for Turkey; *Yearbook of National Accounts Statistics*, United Nations, 1969, country tables for other countries; from Table VIII-2 in Krueger, *Turkey*, op. cit.

contributing factor in Turkey's high figure. . . . Nonetheless, the very high Turkish figure combined with interview impressions and sample data suggests that inventories were probably substantially higher as a result of the trade regime than they would otherwise have been."[63]

Finally, we should note that, for Ghana, Clark Leith regressed, using cross-sectional data for Ghanaian industries for 1968, the material stocks at the beginning of the period as a percent of materials used during the period (*ST/USE*) on the percent of imported material used in total material purchases (*IMP/TOT*). He found the relationship:

$$ST/USE = 25.48 + 0.805\ IMP/TOT \qquad R^2 = 0.075 \qquad (5.3)$$
$$(1.480) \qquad DF = 27$$

where the explanatory power of the equation was very low.[64] Leith, in discussing the failure of his estimation exercise to reveal the link between inventories and the exchange control system, notes that "while the restrictive regime may shift the demand for inventories outward, it may also prevent the satisfaction of that demand."[65] A further reason that could imply lack of a significant relationship is that, in a *cross-section* analysis, the requisite assumptions to put all industries in one regression are not necessarily satisfied to begin with; any "prevention" of the satisfaction of demand for more inventories should affect all industries. It seems much more likely that the cross-section analysis fails to allow for critical differences among alternative industries and firms that affect the dependent variable. For example, a high ratio of import dependence on raw materials may be correlated with larger size of firms (because larger firms are associated with the modern import-substituting sector that is characterized by high imports of raw materials and intermediates) and larger firms may also be better able to break bottlenecks arising from critical shortages of inventories just because they have better access to the licensing authorities (as has indeed been discussed in Chapter 2), so that they would need to hold less inventories, *ceteris paribus*, on that account. Cross-sectional regressions are thus likely to yield poor results for reasons different from those that afflict time-series analysis of this question.

Basing ourselves largely on the international-comparisons type of evidence and the institutional evidence on licensing procedures that would seem to create the need for holding added inventories, we may then conclude that exchange control regimes are prone to lead to increased social costs on this account.

V. EFFECTS OF CHEAP IMPORTS OF CAPITAL GOODS AND RAW MATERIALS

One of the major aspects of the overvalued exchange rate systems in many of the countries in the Project was that intermediates and capital goods, when imported from abroad by producers under import licensing, were imported at premium-exclusive prices and at relatively low tariffs. Hence, compared to the situation where the parity would have been allowed to adjust, it can be argued that such imports were artificially cheapened by these exchange control regimes. Another aspect of the same phenomenon is that (producer-) imported intermediates and capital goods were cheaper for the favored firms under these exchange control regimes than were domestic substitutes.

Hence it is clear that the choice of technique by producers could be distorted if there was substitution between domestic and imported inputs. There is in fact plenty of evidence that, in addition to substitution between capital goods and labor, raw materials also substitute with capital and labor. For example, the loss of raw materials in production may be reduced by more expensive equipment costing more capital, rejects may be reduced by better supervision costing more salaries, and so on. Raw materials further substitute with one another as in the Egyptian analysis of Hansen and Nashashibi where low-quality imported and high-quality domestic raw cotton are considered as alternative inputs in the cotton textile industry. There are both specific examples of such substitution in the literature and econometric studies, incorporating raw materials in the specification of the production function (for gross output rather than for value added), which allow successfully for such substitution.[66]

However, in determining the resultant impact on choice of techniques and relative outputs of alternative sectors, it is important to distinguish between micro-effects and macro-effects. Assuming that the overvalued exchange rate system reduces available imports and that this translates into a lower quantity of capital goods imports, for example, we then see readily that while each micro-producer would have an incentive to shift his choice of technique toward cheaper imported equipment, the reduction in the total availability of such imports must reflect itself in the final equilibrium. It is clear then that, given the direct allocation system, we can think of each individual choice being biased in this way but the total demand for imported equipment being rationed to what is feasible, so that the additional demand will be addressed to *domestic* equipment (where available), which is both more expensive than imported equipment *and* costlier than under a more liberal trade regime. We must think therefore of a set of techniques where the imported equipment has been used at lower prices and another where the domestic equipment has been used at

higher prices—than under a more liberal regime. Each set of choices is distorted and suboptimal, in consequence. It also follows that the activities, firms, and industries that are allowed access to cheaper imported equipment (or raw materials, for that matter) will also expand relative to those that are not so fortunate.

Evidence on such effects in the countries in the Project is found in Ghana, Turkey, and Pakistan and points in direction of the conclusion that such distortions were significant. For Ghana, the argumentation is confined to micro-effects and extends to raw material imports. Basically, Leith has estimated Cobb-Douglas production functions for three industries, using cross-section data on establishments where gross output is defined on capital, labor, domestic materials, and imported materials.[67] He then proceeds to estimate the implicit subsidy on imported raw materials for each industry—by assuming that this can be defined as the proportionate cheapening of imports relative to the average cost of importation in all industries, inclusive of import premiums.[68] Using the equilibrium factor-reward conditions, the shift in technique following from such a subsidy, given the prices of all other factors, can be readily worked out. However, output levels are indeterminate unless some additional assumption such as diminishing returns to scale or increasing supply price of at least one factor, with given output price, is made. Thus Leith, who intends to consider not merely the shift in technique but also the expansion of output following the implicit subsidization of the imported inputs, assumes that labor or domestic materials are subject to increasing supply price.

Using the observed prices of inputs and outputs, the estimated Cobb-Douglas production functions and implicit subsidy on imported inputs,[69] and illustrative elasticities of supply of the factor whose supply price is assumed to be increasing, Leith works out alternative estimates of the impact of the cheapened imports of the inputs on supply of output in the industry and on relative factor proportions.

The resulting empirical estimates, thus based on Ghanaian reality as far as feasible, are nonetheless stated by Leith to be "nothing more than illustrative of the general type of response exhibited by Ghanaian industries." However, they suggest a significant response of output in Ghanaian industries to subsidies on imported inputs and a fall in the ratio of output to these inputs, conclusions that carry over *also* to subsidized capital use as well, and hence presumably to any cheapening of capital goods imports that results from the exchange control regime (as discussed already).[70]

The evidence from Turkey is focused on the substitution between imported and domestic equipment, rather than on imported *versus* domestic raw materials as in the case of Ghana. But this evidence is somewhat inconclusive, revealing no link between the relative price of imported and domestic equipment and their relative quantities. Thus Krueger cites the earlier study of McCabe

and Michalopoulos, which yielded for all of Turkey during 1950-1963 the following regression:

$$\log (I_m/I_d) = 2.40 - \underset{(0.04)}{0.03} \log (P_m/P_d) + \underset{(2.57)}{0.26} \log (R_e/R_d) \qquad (5.4)$$

$$- \underset{(-6.51)}{1.60}\, D$$

$$R^2 = 0.89, \quad F = 28$$

where I_m/I_d was the ratio of investment in imported to domestic capital equipment, P_m/P_d the ratio of the prices of the two kinds of equipment, R_e/R_d the ratio of external to internal credit (the volume of bank loans) and D was a dummy for the post-devaluation years (1959-1963).[71]

The McCabe-Michalopoulos hypothesis was that the availability of foreign credits (official and private) largely determines total capital goods imports and that the relative price of imported to domestic equipment also influences their relative use. The regression result did not, however, bear out the latter link. This may very well have been due to the fact that the (significant) devaluation dummy picked up this price effect. The evidence thus remains somewhat inconclusive, especially if we further note that the indices of capital goods prices, imported and domestic, are likely to contain more than the usual complement of errors, that the two independent variables P_m/P_d and R_e/R_d are likely to be correlated, and that external credits do not account for all capital goods imports while internal credits would generally not match the value of purchases of domestic equipment.

No output-expansion and contraction effects can be deduced from the above exercise. By contrast, the Leith exercise for Ghana did produce estimates of output expansion in specific industries in response to the implied subsidy on imported inputs in a partial-equilibrium framework for each industry. However, they rested somewhat heroically on an assumption about the presence of "diminishing returns" from one or more (arbitrarily specified) factors with rising supply price and the further assumption that the supply of the imported factors would be perfectly elastic to the favored firms up to the amount necessary to support the increased output at the new technique.

Evidence on compositional shifts in output or investment, linked to the trade regime, is available for Turkey. Phase II periods there are associated with relative expansion in the import-unintensive investment in construction relative to investment in import-intensive machinery and equipment. As Krueger notes, "the timing of the changes in importance of construction in total investment coincides remarkably closely with the delineation of Phases of

the trade regime in Turkey. During Phase II, in both the 1950's and 1960's, investment became increasingly oriented toward those sectors requiring relatively few imported capital goods. During Phase IV of the early 1960's investment shifted toward plant and machinery. . . ."[72] Evidence of compositional shifts linked to changes in international economic regimes is to be found in the Chilean study as well.[73]

Further evidence of the impact of the trade regime on choice of techniques comes from Pakistan. The cheap importation of capital goods under the overvalued exchange rate to the agricultural sector has been shown to have accentuated the tractorization of Pakistani agriculture in the Panjab, in the work of Bose and Clark.[74] Comparing the relative price of tractors to output (e.g., wheat and rice), at landed and domestic prices, these authors show that, in the domestic market, owing to the ability of the farmers to secure imports of tractors at landed (premium-exclusive) prices, the relative price of tractors was considerably more advantageous than it would have been if the exchange rate had been unified for imports of both tractors and agricultural outputs.

Citing Bose and Clark, Nurul Islam has argued that capital available to the large farms in agriculture was underpriced not only because they had access to the imported agricultural machinery at relatively low price, but also because the large farmers had access to borrowed capital from credit institutions at a rate of interest of about 6.5 percent per annum. This low rate of interest compared with the shadow price of capital, which was estimated to be between 10 percent and 15 percent. The opportunity cost of agricultural machinery such as a stationary thresher, after correction for the overvaluation of the domestic currency and for underpricing of capital, was estimated to be 40 percent to 60 percent higher than the market price at which it was available substantially below its opportunity cost.

The combined result of the above factors was that from the private point of view, mechanization in agriculture was profitable. However, its profitability was in serious doubt from the social point of view. According to one estimate, the social cost of tractor mechanization (evaluating all inputs including prices of tractors in world prices and labor at zero social cost) exceeded social benefit by 43 percent to 60 percent, depending upon the intensity of tractor use varying between two acres and three acres per horsepower. The social benefit consisted of output (evaluated in world prices) and of the opportunity cost of fodder that would be saved consequent on the replacement of the bullock by the tractor. However, private costs were not much higher than social costs evaluated in world prices because tractors were available until recently at the official rate of exchange with little or no duty. While the social rate of discount used was 10 percent, the big farmers who were using tractors could borrow at 6.5 percent. The only significant element of private cost not included in social cost was the cost of labor. Total private costs in domestic

prices were about 14 percent higher than social costs, excluding labor, in terms of world prices. But private returns were considerably higher than social returns. The evaluation of agricultural output in domestic prices was 30 percent higher than world prices, and hence private returns from output were 30 percent higher than social returns, excluding the additional value of output released from the production of fodder. Furthermore, there was the saving of labor costs, especially in the displacement of sharecroppers or tenant farmers, who received a larger share of output than wage labor. Nurul Islam therefore concludes that while the precise calculations of private versus social costs and benefits of mechanization would require further studies, the broad orders of magnitude are clear and show that "the price structure for scarce inputs, i.e., capital and foreign exchange, had the effect of increasing the private returns of mechanization above the social returns."[75]

The weight of the evidence in the countries in the Project then is in support of the hypothesis that exchange control regimes, by cheapening the cost of intermediates and capital goods, influence and distort both the choice of techniques within activities and the relative composition of outputs and investments among activities.

VI. MISCELLANEOUS EFFECTS

Before we proceed, in Chapter 7, to discuss their additional allocative effect in the shape of discrimination against exports, we need to complete the present analysis by reference to yet other effects of exchange control regimes.

A. Reduced Competition

The availability to domestic producers of protection against imports was a major aspect of Phase II type regimes, as we have already noted. It should also be noted, however, that this form of QR-generated protection could take extreme forms, as in the Indian rule that importation of an item generally required the production of "non-availability" certificates from indigenous suppliers, or be operated somewhat less drastically as in Turkey or Colombia. Moreover, over time, there is evidence that both the pressure from user industries, who were forced to use costly and/or inferior substitutes, and also the independent realization that automatic protection with QRs could lead to extremely high protection, led to the establishment in many countries of modified procedures and practices to reduce the incidence of automatic protection. Thus, in Israel, ceilings were established on the amount of price differential that domestic import substitutes were entitled to. In India, the possibility of securing imports of

materials despite the law of indigenous availability was, *de facto*, made somewhat easier after the recession following the 1966 liberalization had given way to improved levels of activity, and a cell was established in the Ministry of Industry to monitor foreign-domestic price differentials. In Brazil, the law of similars, parallel to the Indian law of indigenous availability, was also progressively eased. And in South Korea, automaticity in domestic protection was progressively dismantled through the 1960s. For both Israel and South Korea, furthermore, the use of QRs was progressively reduced and (relatively moderate) tariff protection took over, implying that protection was no longer total and that the import-substituting firms had to face a relatively elastic supply of imports at the tariff-inclusive price. During the bulk of the Phase II regimes, however, the effect of the QRs was indeed to confer fairly automatic protection to domestic production in nearly all of the countries in the Project. Two negative consequences of this elimination of foreign competition must be noted.

1. The lack of foreign competition could imply that the domestic firms had less reason to be conscious of reducing costs. As Hicks once remarked, a monopolist's chief revenue is leisure. This effect does not necessarily follow insofar as free entry of domestic firms into production could serve to eliminate excess costs. However, in many of the countries in the Project, such free entry was generally not possible because of either industrial licensing or capital-goods-imports licensing. Given raw-material-imports licensing *pro rata* to capacity, efficient firms could not expand and compete effectively with the inefficient firms either. Hence, domestic entry was not free and the restriction or elimination of foreign competition through use of QRs for conferring automatic protection meant that the prospect of having effective competition was often reduced to negligible levels. The only substantial exceptions to this situation were to come from fortuitous overexpansion of capacity by all firms taken together or the possibility of competitive expansion by firms using domestic inputs and equipment outside of the control framework. Such exceptions were therefore generally not important.

2. The lack of attention to cost reduction was not the only consequence of the elimination or significant reduction of competition. One could also have monopolistic restriction of output. In fact, given the relatively small (economic) size of the market and the possibly large economies of scale in many modern industries, it is clear that the elimination of foreign competition could leave the domestic field open to successfully collusive behavior on the part of the few firms that could supply the (small) market. The welfare losses from such growth of domestic monopolies, in the sheltered markets created by QRs, may be quite significant even if we rule out the cost-raising inefficiency discussed immediately prior to the present point.[76]

Both the above effects are difficult to quantify in practice and there is

therefore scant, direct evidence on them in the country studies in the Project, an excellent example being provided, however, by the case of the tire industry in Egypt.[77] However, there is considerable institutional evidence of the automaticity of protection, and the methods of allocation of raw material and capital goods licenses, to support the contention that the exchange control regimes in many of these countries did manage to blunt competition seriously and thus to make the economy liable to the inefficiencies of the two types just detailed. The only systematic analysis of the effect of the reduced competition in the Project is in regard to possible reduction in the incentives to conduct research and development or improve quality matters taken up in Chapter 7 later.

B. Delays, Administrative Costs, and Resource Loss

The process of getting licenses allocated under the exchange control regimes requires resource input that is likely to exceed the corresponding demands made under a market system. This is because the bureaucratic regimes that oversee and administer the license allocations are characterized by varying degrees of delays arising from bureaucratic procedures, which are unlikely to exist on the same scale in a market-oriented system. The authors of the study of India, for which serious delays have been amply documented, argue as follows:[78]

> The working of any system of allocation will take a certain amount of time. Even if a free foreign exchange market were to operate, the participants in the market would have to expend time, for example, in acquiring information about availabilities of different kinds of foreign exchange. In principle, the administrative system of allocations need involve no significant increase in time, and hence in "delays," over a price system under which scarce foreign exchange is rationed out in the market: the introduction of priorities would, in principle, be equally time-consuming in both cases, though the procedure would be different, since the price system would involve administrative decisions as to tax and subsidy incentives whereas the control system would involve administrative decisions as to quotas.
>
> In practice, however, the exchange control system seems to degenerate into an inordinately time-consuming allocational device. There are essentially three reasons for this. (1) In a situation of general scarcity of foreign exchange, the definition of priorities becomes exceptionally difficult. . . , and the system ends up having to accommodate all conceivable demands on some "equitable" basis, while making a pretense of administering priorities, this pretense frequently taking the form of collection of yet more information from applicants and time taken in "scrutinizing" it and "arriving at an informed decision." Delays become, sociologically, the "conspicuous" substitute for exercise of priorities by

> the bureaucracy. (2) Equally important, the multiplication of the bureaucratic apparatus leads inevitably to files failing to move quickly and decisions being delayed because procedures are time-wasting. . . . much of the delay to which the Indian import-control system was subject can be put down to the inefficiency of administrative procedures. For example, where indigenous clearance had to be obtained by the DGTD [Directorate General of Technical Development] from two or more other directorates, these were to be sought sequentially rather the simultaneously. (3) Finally, some significance must be attached in explaining delays under the Indian allocation system, to the fact that, with files often moving from the bottom to the top in the Indian administrative system, they often fail to move until suitable graft is paid to the lower-level clerks. If all graft were paid promptly, there should be no delay on this account; but newcomers and honest applicants are unlikely to conform readily to this widespread practice, hence delays occur on this count in the system as well.

These delays (which are also documented for restrictionist periods in Chile[79]) mean, of course, that it (privately) pays firms to engage in hiring resources (e.g., contact men) to expedite the moving of licenses and, where corruption arises, to secure for themselves the licenses that should have gone to others (the case of normal corruption) or licenses that should have come their way anyway but which were being held up merely for collecting bribes (the case of "ultimate" corruption). In short, the exchange control regimes are likely to wind up using real resources, which could well have been utilized productively under alternative regimes, merely in order to minimize delays and to deflect licensed allocations in desired directions.

In addition to these losses, we must reckon the *direct* costs of administration that exceed the market system's costs. Not merely are the administrated exchange allocations costly in inducing firms to expend resources in minimizing delays and maximizing access to licenses, they also are likely, in practice, to cost more administrative resources per se. In the absence of the constraint provided by the profit motive, the bureaucracy is likely to proliferate beyond the optimal level necessary to administer.

Little hard evidence can be produced on these resource effects, and practically none is available for the countries in the Project. Again, however, the evidence is inferential and relates to the great delays in licensing, the growth of resources devoted to tackling the licensing system (in the shape of air travel to centers of bureaucratic allocations, hiring of contact men, etc.), and the growth of the bureaucracy in general in some of the countries in the Project, especially India, Egypt, and Turkey, during their Phase II years.

C. Other Effects

Finally, although the evidence on them is somewhat scant and sporadic, it is worth noting a few additional effects. Thus, Hansen and Nashashibi note for

Egypt that the import-licensing policy typically failed to allow for sufficient imports of spares for maintenance of equipment.[80] This was a problem with the Indian policy as well, and it also arose in Chile, requiring attention *via* appropriate modifications permitting freer access to foreign exchange for the importation of spare parts. Identical problems arose, of course, with the imports of equipment for replacement.

The desire to enforce investment controls strictly was responsible for such a policy. It also led, as in India, to preoccupation with the prevention of imports of "balancing" equipment to augment capacity at low marginal cost. The licensing authorities would frown on these as attempts to get around controls on capacity. The result was often to inhibit low-cost additions to capacity. The prevention of expansion of capacity by working more shifts, and hence economizing the use of capital, also could follow (though, as with underutilization of capacity given the number of shifts, the factors affecting the lack of multiple-shift working are numerous).

Then, we must also note the effect of source-tying of aid and source restrictions *via* bilateral agreements on the choice of technique. Artificially high prices of capital goods, as a result of purchases forced from more expensive sources, should shift the choice of technique toward labor-intensive goods. But in densely populated countries such as India, Pakistan, and Egypt, where labor's shadow wage *might* be considered to be lower than its actual wage, this may not necessarily be an adverse effect. On the other hand, such source-tying could also mean importation of capital-intensive technology. For example, U.S. machinery (imported with U.S. aid) may be more automated then Japanese machinery. Similarly, Kidron has noted how source restrictions have often led to strange amalgams of disparate components from different sources into a working whole, giving the visitor to a plant in India the recurrent impression that he was visiting a museum.[81] Needless to say, in such cases, the productivity of the plant, so assembled, cannot have been as high as when the equipment was put together without source restrictions in the most economical way.

In conclusion, we may close this chapter with the judgment that, while part of the evidence is inferential in deducing effects from the observed institutional features of the exchange control regimes of the Phase II variety and only part is direct, the overwhelming bulk of it is consistent with the view that the static efficiency effects of such regimes have been adverse in practice.

NOTES

1. If we take "structural" models (e.g., the Feldman-Mahalanobis type of model discussed in Chapter 6), the current allocation of investments may critically affect growth. We leave out this and other such problems (e.g., second-best savings arguments) from the present analysis.

2. Of course, it is possible to show that the long-run rate of growth *asymptotically* may be independent of such a productivity loss: as in R. Solow, "A Contribution to the Theory of Economic Growth," *Quarterly Journal of Economics* 70 (February 1956):65-94.

3. Allocative inefficiency resulting from bias against *exportation* is discussed, however, in Chapter 7.

4. Ghana, op.cit., Section 2. For the supporting statistics, see Table IV-2 on p. 84. Leith also has a rough Kendrick-type calculation for Ghana; ibid, p. 82, footnote 6.

5. *Israel*, op.cit., Chapter 6, Section (3), pp. 159-163.

6. *Israel*, ibid., p. 163.

7. *Chile*, op.cit., Chapter 12, pp. 276-280.

8. *Chile*, op.cit., Chapter 4; *Colombia*, op.cit., Chapter 6; *Egypt*, op.cit., Chapter 2; *India*, op.cit., Chapter 2; and *Turkey*, op.cit., Chapter V.

9. *India*, op.cit., p. 38.

10. However, as we note below, Hansen and Nashashibi have attempted a more ambitious analysis than DRC computation for Egypt with care and ingenuity.

11. However, as noted in the next footnote, the shadow prices will equal the market prices of factors under *ad valorem* trade and product market distortions.

12. While it is relatively straightforward to argue that the appropriate shadow prices on factors should be used for calculating DRCs, their derivation is not an easy matter, either analytically or empirically. Thus, for example, in the context of project analysis, Srinivasan and Bhagwati ("Shadow Prices for Project Selection in the Presence of Distortions: Effective Rates of Protection and Domestic Resource Costs," *Journal of Political Economy* 86 (February 1978):97-116 have shown that the valuation of factors used in the project in question must be such as to reduce the DRCs in the *existing*, trade-distorted activities to unity! On the other hand, if DRCs are computed for the purpose indicated in the text above, that is, to indicate disparities in economic returns arising from existing allocations in a regime of trade distortions, then the DRCs would have to be computed at existing *market* prices of primary factors; but, to anticipate later discussion in the text above, the DRC ranking would not generally reflect the relative expansion or contraction of activities vis-a-vis their optimal level. It might be added that, for the latter questions, the computation of DRCs when distortions other than trade distortions are present, for example, under factor market distortions, would presumably require *some* shadow pricing of factors but, as of the present date, no theoretical exercise that does this explicitly seems to have been undertaken.

13. For this reason, Hansen and Nashashibi make their DRC estimates using *both* c.i.f. and f.o.b. prices for a number of commodities in Egypt. Cf. *Egypt*, op.cit.

14. I. Kravis and R. Lipsey, *Price Competitiveness in World Trade* (New York: National Bureau of Economic Research, Columbia University Press, 1971).

15. This corrective is perhaps essential as there is ample evidence elsewhere of enthusiastic inferences from these arrays of ERPs and DRCs about which industries should be expanded and which contracted, and where a planning commission is wrong in its choice of targets, and so on. Rather we plan to use these estimates much more "weakly" as a broad piece of evidence pointing to the general misallocation that can be inferred as likely to result from the operation of a foreign trade regime that pays little or no attention to economic costs and benefits, without pretense that the numbers tell you anything more than that.

16. *Turkey*, op.cit., pp. 219-222. A still higher variance—43,737.12—is reported for iron and steel products, but Krueger notes (p. 224) that this result is dominated by an extreme observation for bolts and nuts.

17. Ibid., p. 225.

18. See *India*, op.cit., Chapter 13, Tables 13.3 and 13.4, in particular. *Turkey*, op.cit., Chapter VIII, pp. 216-226, including Table VIII-1, also has some factory- and firm-level DRC estimates, suggesting significant variability.

19. Cf. *South Korea*, op.cit., p. 201; and *India*, op.cit., pp. 178-182. On South Korea, note that the low rates of dispersion apply to estimates of effective protection after deleting all activities with ERP rates over 500 percent; and that "the degree of dispersion increases as the measure of protection includes more of the incentive policies" (pp. 200-201). Note also that the Korean study reduces a number of quantitative measures to *ad valorem* "equivalents" and that the resulting statistical picture of low dispersion rates probably hides substantial differences and selectivity in effective incentives to different industries: a point to which we return in Chapters 7 and 8.

20. Cf. Hansen and Nashashibi, op.cit., pp. 167-194.

21. *Egypt*, op.cit., p. 169. They argue that:

> A comparison between prediction 1 and actual crop areas will yield an estimate of the extent to which the government's interference has forced cultivators to deviate from the cropping pattern they would have chosen at the given domestic prices without government area interference.
>
> A comparison between prediction 2 and actual crop areas will tell us whether or not government area interference has forced cultivators to adopt a crop pattern similar to what they would have chosen themselves had the domestic prices been equal to international prices. Should this happen to be the case, the government has performed as well as the market forces would have done at the given international prices without area controls.
>
> A comparison between predictions 2 and 1 will show the difference between the result of private market forces at actual domestic prices and at perfectly free trade and thus illustrate the effects of price distortion.
>
> A comparison between prediction 3 and actual crop area will indicate the distance of the actual pattern from the optimal crop pattern—assuming that the cultivators' long-term response is optimal. If the government could instantly accomplish a cropping pattern according to this prediction, area allocation would be optimal and perhaps better than what the cultivators could accomplish under free trade. It should be understood that such perfect planning would require that there be no extra (social) costs involved in instantaneous adjustment, and that the government be capable of making perfect forecasts of both prices and yields for the crops to be sown. We assume that these conditions are fulfilled.

22. Ibid., pp. 189-190.

23. This distinction between the pattern and degree of import substitution, as two separate aspects of the analysis of the efficiency of import substitution, was developed earlier in J. Bhagwati, "Trade Policies for Development," in G. Ranis, ed., *The Gap Between the Rich and the Poor Nations* (London: Macmillan), Proceedings of the International Economic Association Conference at Bled, Yugoslavia, August 27 to September 2, 1970. Note that "interindustrial" includes "intercommodity" or "interactivity."

24. *Colombia*, op.cit., p. 226.

25. The superiority of the Corden technique has been demonstrated in general equilibrium theory by A. Ray in his excellent contribution to the *Symposium* on the Theory of Effective Protection in the *Journal of International Economics*, 3, 3 (August 1973). For a fuller and more definitive treatment, see also H. Suzuki, "Nontraded Inputs and the Effective Rate of Protection," *Journal of International Economics*, 1978, forthcoming. Note however that, in the case of Chile at least, the distinction between the two measures is not empirically important. Cf. *Chile*, op.cit., Appendix B, p. 375.

26. *South Korea*, op.cit., Chapter 10, pp. 206-208.

27. *South Korea*, op.cit., Chapter 10, pp. 207-208.

28. See J. Behrman, *Chile*, op.cit., Chapter 12, for full details of this analysis.

29. Ibid., Chapter 12, page 271.

30. Nor, for that matter, did Behrman manage to find any significant association between DRCs and growth indices.

31. S. Guisinger, "The Characteristics of Protected Industries in Pakistan," in H.G. Grubel and H.G. Johnson, eds., *Effective Tariff Protection* (General Agreement on Trade and Tariffs, Geneva: 1971).

32. "Tariff Protection and Industrialization via Import Substitution: An Empirical Analysis of the Nigerian Experience," *Bangladesh Economic Review* 1, 4 (October 1973):331-340.

33. However, Alan Deardorff has recently shown, in R. Dornbusch and J.A. Frenkel, eds., *International Economic Policy: Theory and Evidence* (Baltimore: Johns Hopkins Press, 1978), that when *n* prices change as a result of $n>2$ different tariffs, a *correlation* will exist between the tariff rates and the changes in the *n* activities' outputs.

34. In fact, for predicting *output* changes, as distinct from "value-added" changes, in models with imported inputs, the effective protection measures run into trouble *even if* we confine ourselves to *two* goods. This problem was first raised by V.K. Ramaswami and T.N. Srinivasan, "Tariff Structure and Resource Allocation in the Presence of Substitution," in J. Bhagwati, et. al. eds., *Trade, Balance of Payments and Growth* (Amsterdam: North-Holland, 1971) and is extensively analyzed in the contributions of M. Bruno and J. Bhagwati and T.N. Srinivasan in the symposium on the theory of effective protection in general equilibrium in the *Journal of International Economics*, 3 (August 1973).

35. Thus, the causal relationship may well run from the growth and size of an industry to the magnitude of its tariff protection. In fact, it is only recently that economists have begun to concern themselves with the question of why tariff structures are what they are, as distinct from what they should be. At an institutional-analytical level, the work of Padma Desai on the criteria used by the Indian Tariff Commission in granting tariff protection represents one approach of interest and importance (cf. her *Tariff Protection and Industrialization: A Study of the Indian Tariff Commission at Work*, Delhi: Hindustan Publishing Corporation, 1970). At a statistical-econometric level, the work of Travis, Basevi, et. al. on examining the factor intensity of protected industries in the United States represents a different, and equally useful, approach; for an interesting analysis of the relationship between the labor force characteristics of an industry and the degree of exemption secured by it from the across the board 50 percent tariff cut in the Kennedy Round, see John Cheh, "United States Concessions in the Kennedy Round and Short-Run Labor Adjustment Costs," *Journal of International Economics*, 4 (November 1974):323-340.

36. See J. Bhagwati, "On the Equivalence of Tariffs and Quotas," op.cit.; and G. Fishelson and F. Flatters "The (Non-) Equivalence of Optimal Tariffs and Quotas under Uncertainty," op.cit.

37. In consequence, a high import premium may merely reflect the fact that *both* imports and domestic production are controlled, so that the correspondingly high ERP, instead of reflecting the excessive growth of domestic production, may indicate the opposite, namely, that domestic production has been severely curtailed!

38. Evidence on this is available for India and Pakistan. See Padma Desai, *Tariff Protection. . . ,* op.cit. (1970); and Nurul Islam, *Pakistan*, op.cit.

39. This view, of course, has its parallel in the view expressed earlier that the differential DRCs among activities must be taken also to imply, only in a broad and rough manner, the differential *returns* to different activities in the system, stemming from the presence of the exchange control regime.

40. The discussion below follows closely the detailed argumentation in *India,* op. cit., Chapter 13, Section 2. The effects on multiple-shift working are discussed later.

41. This could happen, to some extent, through illegal purchases in the black market, as discussed in Chapter 4.

42. Needless to say, this incentive becomes relevant only if the gain from import-premium-exclusive access to materials exceeds the cost of installation of yet more capacity. Hence, the likelihood of the bias leading to installation of yet more capacity (despite current underutilization) increases with the import premium and the proportion of imported inputs to value added and decreases with the cost of capacity installation.

43. G. Winston, "Capital Utilization in Economic Development," *Economic Journal* 81 (March 1971):36-60.

44. This argument has subsequently been shown to have an analytical weakness; see the discussion in Mary Ann Baily, *Capital Utilization in Kenya Manufacturing,* Ph.D. dissertation submitted to M.I.T. (February 1974).

45. This argument is not persuasive as it equates increased numbers with increased competition: an issue that is well recognized in the theory of imperfect competition.

46. This argument is also therefore not persuasive.

47. Islam, *Pakistan*, op.cit., Part IV, Chapter II, pp. 30-31.

48. Cf. *Chile*, op.cit., Chapter 9, pp. 231-236 for full discussion.

49. Ibid., Chapter 9, p. 231.

50. Behrman refers in this regard to "frequent policies of increasing food imports as part of the anti-inflationary strategy" and notes that such imports may have had a negative impact on capacity utilization in agriculture (Behrman, op.cit., p. 234).

51. Ibid., Chapter 9, p. 236.

52. *Colombia*, op.cit., Chapter 8, pp. 118-119.

53. For detailed evidence, see Bhagwati and Desai, op.cit., pp. 321-323.

54. In both cases, the authorities not merely wished to constrain the pattern and level of output but were occasionally unwilling to relent because they felt that the firms were trying to dodge the rules.

55. *India*, op.cit., Chapter 2, p. 46; see also Chapter 8 and 11.

56. *Ghana*, op.cit., pp. 154-156.

57. But, again as with most other countries, Leith found no meaningful regression link between capacity utilization and other variables. For details on some regressions that he tried, see ibid., pp. 105-108.

58. *Turkey*, op.cit., p. 230.

59. To the extent therefore that firms do so, the bottlenecks experienced will be reduced: hence excess capacity costs discussed in the preceding section, (only) insofar as they result from such bottlenecks, are less the greater the excess inventory costs.

60. This argument becomes yet more cogent in the case of exchange control regimes that prevent legal resale of imports.

61. Cf. Krueger, *Turkey*, op.cit., Chapters V and VIII; and Bhagwati and Desai, op.cit., Chapters 15 and 16.

62. Among several contributions, see A.K. Sen, "Working Capital in the Indian Economy," in P.N. Rosenstein-Rodan, ed., *Pricing and Fiscal Policies* (London: George Allen & Unwin, 1966).

63. *Turkey*, ibid., pp. 228-229.

64. *Ghana*, op.cit., pp. 106-107.

65. Ibid., p. 107.

66. Cf. Z. Griliches and V. Ringstaad, *Economies of Scale and the Form of the Production Function* (Amsterdam: North-Holland, 1971), for such estimates using Norwegian data; Padma Desai, "Technical Change, Factor Elasticity of Substitution and Returns to Scale in Branches of Soviet Industry in the Postwar Period," paper presented to the Reisenberg Symposium, *On the Measurement of Factor Productivities: Theoretical Problems and Empirical Results*, (June 23-27, 1974, Munich), published in the series: *Mathematical Studies in the Social and Behavioral Science*, F.L. Altmann, O. Kyn, and H. Wagener, eds. (Gottingen-Zurich: Vandenhoeck and Ruprecht, 1976), for Soviet Union; and D.F. Burgess, "Production Theory and the Derived Demand for Imports," *Journal of International Economics* (May 1974), for Canada.

67. *Ghana*, op.cit., pp. 97-105. The estimation uses value data rather than deflated data owing to lack of information on quantities; and for a fourth industry (radio/TV), the Cobb-Douglas form is merely assumed rather than estimated, the exponentials being estimated from the shares.

68. Leith is therefore assuming that a liberalized regime would have been characterized by an import parity equivalent to that obtained by looking at the import EER (*inclusive* of the import premium). This however would be an overstatement if, as argued in the text, foreign exchange earnings would improve under a liberalized regime, *ceteris paribus*.

69. Leith also adds in the cheapening of capital that follows from low real interest rates.

70. See, in particular, Tables IV-9 and IV-10 in *Ghana*, ibid. The methodology underlying the calculations is also spelled out more fully in Appendix D in that volume.

71. *Turkey*, op.cit., pp. 236-238.

72. Ibid., p. 237.

73. Cf. *Chile*, op.cit., Chapter 6.

74. S.R. Bose and H.H. Clark, "Some Basic Considerations in Agricultural Mechanization in West Pakistan," *Pakistan Development Review* (Autumn 1969); cited in Nurul Islam, *Pakistan*, unpublished manuscript (NBER).

75. *Pakistan*, op.cit., Chapter II on "Choice of Techniques, Capital Utilization, Scale and Productivity." Footnotes have been omitted from the quotes.

76. The work of Arnold Harberger, "Monopoly and Resource Allocation," *American Economic Review Proceedings*, 44 (May 1954):77-87, has contributed to the notion that such welfare losses are generally small. However, doubt has been effectively raised on this issue by A. Bergson, "On Monopoly Welfare Losses," *American Economic Review* 63 (December 1973):853-870.

77. Cf. *Egypt*, Chapter 9.

78. *India*, op.cit., pp. 41-42.

79. *Chile*, op.cit., Chapter 4, pp. 14-16.

80. *Egypt*, op.cit., Chapter 5. Earlier, we discussed the *separate* point that delays characterized the *access* to (given) spares.

81. Cf. Michael Kidron, *Foreign Investments in India* (London: Oxford University Press, 1965).