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Center for Latin American Development Studies

CAPITAL UTILIZATION, GROWTH, EMPLOYMENT, AND BALANCE OF PAYMENTS AND PRICE STABILIZATION

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Discussion Paper Series

Number 22 December 1976

REVISED
December 1976

CAPITAL UTILIZATION, GROWTH, EMPLOYMENT, AND BOP AND PRICE STABILIZATION

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An earlier version of this paper was presented to the Conference on Planning and Short Run Macroeconomic Policy organized jointly by the Latin American Social and Economic Planning Institute, the Ministry of Planning and Economic Policy of Panama and the NBER, held at the Isla Contadora, Panama, Oct. 31 - Nov. 2, 1975. The author wishes to thank the participants of that conference especially Drs. J. Hanson, L.E. Rozas, J. Behrman, and M.I. Nadiri for their comments. He is also indebted to Mr. Jorge Rodriguez for valuable computational help.

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I

Capital Idleness in the Midst of Capital Scarcity

Latin American countries are unanimously regarded as being well endowed with labor and scarce of capital. In such a situation, common sense leads to the conclusion that what capital exists should be intensively used and what labor exists should be extensively applied. Yet casual empiricism and as well as more careful research indicates that this natural expectation does not correspond to reality: capital, despite its scarcity, is underutilized.[1/] Parallely, large scale unemployment exists. Hence a situation reminiscent of Keynes pervades the Latin American economic scene: the coexistence of unemployed labor and unemployed capital. What is more, this underutilization of capital appears not to be a temporary phenomenon, the result of short term fluctuations in aggregate demand or of building ahead of future need, but rather it appears to be a permanent situation, where the low rate of utilization of capital reflects some more fundamental characteristics of the economic environment. A further element in the picture, which introduces a decidedly non-Keynesian note,

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1/ Early documentation on underutilization of capital can be found in various publications of ECLA, for example, ILPES/CELADE, Elementos para la Elaboración de una Política de Desarrollo con Integración en América Latina, 1968, Ch. 3. More recent data has been developed on Brazil, Chile, Colombia, Costa Rica, Peru and Venezuela in the context of a collaborative research project coordinated by the author at Boston University's Center for Latin American Development Studies. See Kogut, Edy Luiz (1975); Ramos, Joseph (1974); Thoumi, Francisco (1975); Schydlowsky, Daniel M. (1975); Abusada, Roberto (1975/a, b); CORDIPLAN (1974), Abusada (1976)

is the foreign exchange constraint affecting most of these economies. As a consequence, it is not feasible to employ the existing capital and labor simply by expanding aggregate demand. Output might well go up with such a policy, but only for a time, since the import requirement generated by such an increase in industrial production would soon exhaust the international reserves of any of the countries in the hemisphere and hence the policy would abort on its own accord. At the same time, it is true that without additional demand, additional product could not be absorbed. Hence, Latin American capital and labor idleness may well be called quasi-Keynesian.

Capital idleness takes a number of forms. The most important is the short number of hours which machines are used during the day. Indeed, one would expect that under the existing conditions of scarcity, a very large number of firms would work two and three shifts. Yet the overwhelming number of enterprises work only a single shift. Although there are significant differences between firms' behaviour in this regard, the widespread practice of single shifting is the most important contributor to underutilization of capital in the region. Second in line stands the large number of days when activities shut down. These comprise Saturdays, Sundays, holidays, and collective vacations. Again, one would think that the capital scarcity and labor plenty would dictate the use of machines and equipment on a 365 day a year basis. Yet this does not occur. Finally, there is

a significant amount of underutilization of capacity within the shifts and days in fact worked. In some cases machines are idle for large parts of the working day, in other instances intensity of utilization is lower than it well might be.

A more detailed picture of the empirical situation than was heretofore available emerges from the research on capacity utilization in six Latin American countries, coordinated at Boston University's Center for Latin American Development Studies. The countries concerned are Brazil, Chile, Colombia, Costa Rica, Peru, and Venezuela. Table I.1 shows the percentage of firms working one, two, or three shifts in five of these six countries.[1/] It appears that except in Brazil about two-thirds of the firms typically work one shift, another fifteen percent work two shifts, and the remaining twenty percent work three shifts. The country variations around this average are significant with Venezuela showing more single-shift and fewer three-shift firms and Brazil the opposite.[2/]

The pattern inside different industrial groups of course varies both accross industries and across countries, as can be seen from Tables I-2. It is very significant that there are some single shifters

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1/ For Chile, this breakdown has not been tabulated.

2/ The greater incidence of shift work in Brazil may be due to the higher representation of large enterprise in the Brazilian sample.

TABLE I-1

PERCENTAGE OF FIRMS BY NUMBER OF SHIFTS WORKED

		1	2	3
BRAZIL	1974	35.60	25.00	39.40
COLOMBIA	1973	58.79	20.46	20.75
COSTA RICA	1974	66.56	11.00	22.44
PERU	1971	63.70	16.50	19.80
VENEZUELA	1974	73.80	12.70	13.50

Source: Country studies.

TABLE I-2a

DISTRIBUTION OF PLANTS BY SECTOR AND SHIFTS WORKED

COLOMBIA 1973

	NUMBER OF FIRMS			PERCENTAGES		
ISIC	1	2	3	1	2	3
31 Food, Bev. & Tobacco Ind.	32	18	21	45.1	25.4	29.6
32 Clothing & Leather	42	12	10	65.6	18.8	15.6
33 Wood & Woodwork	19	-	-	100	-	-
34 Paper, Printing & Publish.	10	6	7	43.5	26.1	30.4
35 Chemicals & Coal	29	10	16	52.7	18.2	29.1
36 Non-Metalic Mineral	17	6	7	56.7	20.0	23.3
37 Basic Metals	3	1	3	42.9	14.3	42.8
38 Metal Working	47	17	7	66.2	23.9	9.9
39 Miscellaneous	5	1	1	71.4	14.3	14.3

Source: Data underlying Thoumi (1975)

TABLE I-2b

DISTRIBUTION OF PLANTS BY SECTOR AND SHIFTS WORKED

COSTA RICA 1974

ISIC	NUMBER OF FIRMS			PERCENTAGES		
	1	2	3	1	2	3
31 Food, Bev. & Tobacco	18	5	7	6	17	23
32 Clothing & Leather	24	5	12	59	12	29
33 Wood & Woodwork	11	-	1	92	--	08
34 Paper, Printing & Publish.	9	3	2	64	21	14
35 Chemicals & Coal	31	6	10	66	13	21
36 Non-Metalic Mineral	6	1	4	55	09	36
37 Basic Metals	1	-	1	5	--	5
38 Metal Working	21	1	5	78	04	18
39 Miscellaneous	6	-	1	86	--	14

Source: Schydlowsky (1975)

TABLE I-2c

DISTRIBUTION OF PLANTS BY SECTOR AND SHIFTS WORKED

PERU 1971

ISIC	NUMBER OF FIRMS			PERCENTAGES		
	1	2	3	1	2	3
20 Food industries	69	35	54	43.7	22.2	34.2
21 Beverage industries	33	4	6	76.7	9.3	14.0
22 Tobacco	2	1	-	66.7	33.3	-
23 Textiles	58	59	63	32.2	32.8	35.0
24 Footwear and wearing apparel	80	2	1	96.4	2.4	1.2
25 Wood and cork	22	2	3	81.5	7.4	11.1
26 Furniture	46	1	-	97.9	2.1	-
27 Paper and paper products	8	1	12	38.1	4.8	57.1
28 Printing and publishing	41	18	3	66.1	29.0	4.8
29 Leather products	20	1	-	95.2	4.8	-
30 Rubber products	11	2	1	78.6	14.3	7.1
31 Chemicals	88	12	33	66.2	9.0	24.8
32 Petroleum and coal	4	1	3	50.0	12.5	37.5
33 Non-metallic mineral products	52	8	14	70.3	10.8	18.9
34 Basic metal industries	6	4	4	42.9	28.6	28.6
35 Metal products	49	13	1	77.8	20.6	1.6
36 Machinery (non electrical)	35	3	2	87.5	7.5	5.0
37 Electrical machinery	36	7	-	83.7	16.3	-
38 Transport equipment	36	5	-	87.8	12.2	-
39 Miscellaneous	58	16	34	53.7	14.8	31.5

Source: Abusada (1975)

TABLE I-2d

DISTRIBUTION OF PLANTS BY SECTOR AND SHIFTS WORKED

VENEZUELA 1974

ISIC		NUMBER OF FIRMS				PERCENTAGES		
		1	2	3	TOTAL	1	2	3
31	Food, Bev. & Tobacco	234	62	58	354	66.10	17.51	16.38
32	Clothing & Leather	264	48	47	359	73.54	13.37	13.09
33	Wood & Woodwork	154	13	5	172	89.54	7.56	2.90
34	Paper, Printing & Publish.	70	30	18	118	59.33	25.43	15.26
35	Chemicals & Coal	171	29	78	278	61.51	10.43	28.06
36	Non-Metal Metallic Mineral	119	13	18	150	79.34	8.67	12.00
37	Basic Metals	41	6	11	58	70.69	10.34	18.97
38	Metal Working	301	40	22	363	82.93	11.02	6.06
39	Miscellaneous	29	4	1	34	85.29	11.76	2.94

Source: Abusada (1976)

TABLE I-2e

DISTRIBUTION OF PLANTS BY SECTOR AND SHIFTS WORKED

BRAZIL 1974

SECTOR	NUMBER OF FIRMS			PERCENTAGES		
	1	2	3	1	2	3
10 Non-Metallic Minerals	25	11	66	24.5	10.8	64.7
11 Metalurgical Ind.	64	60	100	28.6	26.8	44.6
12 Mecanical Ind.	56	72	20	37.8	48.6	13.5
13 Electrical Prod.	44	36	24	42.3	34.6	23.1
14 Transport Material	18	33	29	22.5	41.3	36.3
16 Furniture	35	7	3	77.8	15.6	67.0
17 Paper & Celulose	9	12	54	12.0	16.0	72.0
18 Rubber	3	7	10	15.0	35.0	50.0
19 Skins and hides	12	7	2	57.1	33.3	9.5
20 Chemicals	31	20	87	22.5	14.5	63.0
21 Farmaceuticals	42	8	8	72.4	13.8	13.8
22 Soaps and Detergents	19	3	10	59.4	9.4	31.3
23 Plastics	4	6	26	11.1	16.7	72.2
24 Textiles	22	44	132	11.1	22.2	66.7
25 Clothing	77	7	6	85.6	7.8	6.7
26 Processed foods	82	54	52	43.6	28.7	27.7
27 Beverages	26	9	2	70.3	24.3	5.4
28 Tobacco	2	4	1	28.6	57.1	14.3
29 Diverse	3	4	4	27.3	36.4	36.4

Source: Kogut (1975)

and some triple shifters in each industrial category, thus the products produced do not seem to be a determinant of the pattern of utilization. Whereas this might appear to be a phenomenon of aggregation, it holds true at the more disaggregated level also. The implications of this finding are very interesting: on the one hand, it would appear that the different behavior patterns of different enterprises would reflect a combination of different preferences and different environments; on the other, it indicates that it is not impossible to work more shifts in any sector, as some of the single shifting firms allege.

Table I-3 tabulates the number of days worked in Peru. It is significant that the median firm works a 6-day week throughout the year. On the other hand relatively few firms are true "continuous process" firms, where the costs of stopping or starting the factory are tremendously large and where round-the-clock and round-the-year operation would thus appear to be indispensable.

An equally interesting view is offered by Table I-4 which shows the percentage of capital stock which operates one, two and three shifts with the percentage of labor employed and value added generated in plants working different number of shifts. It can be deduced from this table that the more capital-intensive firms operate a greater number of shifts. A similar conclusion is reached by cross-classifying firms by shifts worked and capital/labor ratios.[1/] Further confirmation

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1/ Note, however, that the K/L ratio must be defined as the ratio of capital services to labor or a distorted measure will result.

TABLE I-3

PERU 1971: NUMBER OF DAYS WORKED PER YEAR IN MANUFACTURING PLANTS

Number of days	One Shift	Two Shifts	Three Shifts	TOTAL
Less than 100	8	-	-	8
100 to 150	18	5	1	24
151 to 200	31	7	6	44
201 to 250	104	15	16	135
251 to 270	95	15	17	127
271 to 290	113	50	55	218
291 to 310	317	71	62	450
311 to 330	48	9	22	79
331 to 360	13	2	28	43
361 to 365	22	18	24	64

Mean = 282
Median = 298
Mode = 302

Source: Ministry of Industry and Commerce, Industrial Statistics for 1971.

TABLE I-4

COMPARISON OF SHIFT-WORK MEASURES

PERU

	Single Shift Firms	Double Shift Firms	Triple Shift Firms
% of Firms	63.7	16.5	19.8
% of Employment	46.0	17.5	36.5
% of Capital Stock	21.9	13.9	64.2
% of Value Added	33.1	18.3	48.6

VENEZUELA

% of Firms	73.8	12.7	13.5
% of Employment	50.5	16.3	33.2
% of Capital Stock	24.8	10.0	65.1
% of Value Added	41.8	15.3	42.9

is obtained from logistic regression analysis.[1/] This result is encouraging since it indicates a lower degree of capital idleness than appears from looking at the number of firms working multiple shifts. It should be borne in mind, however, that low capital-intensive processes have high output/capital ratios and high labor/capital ratios, which means that the amount of output and employment forgone by low capital use in low capital-intensive firms is very much higher than would occur if it were the capital-intensive firms which were underutilizing their capital stock.

The size of the establishment can also be seen to have an effect on the utilization of capital. Analysis of this variable must proceed with caution, however, since firms which work more shifts will simply by that fact be larger, thus output and employment must first be standardized at the single shift level before an impact on utilization can be derived. In the absence of this adjustment, one would pick up the impact of shifting on size and not the impact of size on shifting. Nonetheless, with this correction made, size continues to show an impact on utilization. This can be seen in summary form in Table I-5 which shows data for Colombia, Costa Rica, Peru, and Venezuela on utilization by size of firm.[2/] The Abusada logistic regressions also bring out size as a significant determinant of utilization in a multiple regression framework.[1/]

1/ See Abusada (1975a) and (1976)

2/ Note, however, that in Costa Rica, the percentage of firms working only one shift rises as one goes to the highest size group.

TABLE I-5

SHIFTWORK BY SIZE OF FIRM

NUMBER OF WORKERS PER SHIFT:	1 - 20			21 - 50			51 - 100			> 100		
SHIFTS WORKED	1	2	3	1	2	3	1	2	3	1	2	3
	PERCENT OF FIRMS											
COLOMBIA	73	18	9	71	21	8	47	29	24	36	16	48
COSTA RICA	73	9	18	73	6	20	50	15	35	67	20	14
PERU	n. a.			61	18	21	68	15	17	67	12	21
VENEZUELA	n. a.			75	13	12	77	11	12	67	15	18

The quality of organization is obviously also an important element affecting the level of utilization. The Chilean data show that family firms do not multiple shift nearly as much as do corporations. Indeed, when firms are classified by their form of legal organization (i.e. between corporations and non-corporations) it is found that corporate firms work more shifts than non-corporate ones. A similar variable also helps explain utilization in Colombia. Finally, a related variable, that of foreign participation, appears to have a positive correlation with utilization in both Peru and Costa Rica.

A further major variable which affects utilization is the extent to which a firm's output is exported. In the presence of economies of scale, protected domestic markets tend to develop oligopolistic structures, which hamper expansion of sales and multiple shifting. Exporting provides a "vent for surplus" for the production of additional shifts while not upsetting the domestic oligopolistic structure. Exports seem to be related to utilization in the Costa Rican and Peruvian data, but less so in the Colombian data.

The utilization picture is thus both varied and complex and its explanation requires a multidimensional framework. The next section surveys some recent thinking in this regard.

II

The Private and the Public Calculus of Capital Utilization

The common sense notion that when capital is scarce and labor is plenty the former should be used very intensively withstands rigorous analysis. At the same time, it rapidly becomes evident that there may be circumstances when it is preferable to use more capital than to work longer hours. Essentially, one is confronted with a trade off between working at less desirable hours, i. e., using higher cost labor, and using expensive capital. Such trade-offs are emminently amenable to economic analysis and indeed a number of models have been developed to analyze the optimality of different levels of capital utilization under varying conditions.[1/] All these models maximize an objective, generally profits, but in a few instances the average income of labor, subject to the constraints imposed by a production function and the conditions in the factor and product markets. It turns out that the desirability of an intensive utilization of capital, i.e., shift work, depends essentially on six elements: 1) factor intensities, 2) relative factor prices and particularly, the cost differential between different shift labor i. e. the shift premium, 3) the extent of the economies of scale, 4) the elasticity of substitution between the inputs, 5) the price elasticity of demand, and, 6) the price and availability of working capital.

1/ See for example Abusada & Millan (1973), Betancourt & Clague (1975,a,b,c), Baily (1972), Millan (1973), (1974), Schydlowsky (1974), Winston (1972.)

A high shift premium by itself can make it optimal to keep capital idle. This is intuitively plausible since if the cost of higher shift labor is sufficiently expensive, it pays to buy additional capital for use with more first shift labor rather than incurring the higher labor cost and using the existing capital more intensively. Strong economies of scale may also make single shift work optimal, since the cost savings due to greater volume of output per hour may more than outweigh the cost of keeping the capital idle part of the time. The price and availability of working capital may also make single shifting optimal whenever the cost of such capital is either very high or alternatively is tied in some fashion to the fixed assets owned by the firm. Even if the existence of each of these factors is sufficient to itself generate single shifting, the precise way in which they each affect optimal utilization is naturally the result of interaction between all of the six elements mentioned, none acting independently of the others.

The trade-offs entering the private and the public calculi on capital utilization are the same. Hence, in a perfectly functioning competitive economy, both calculi would yield the same result and the market mechanism would automatically bring about socially optimal capital utilization. In Latin America we observe actions of entrepreneurs which fly in the face of prima facie desirable social behavior. Thus either entrepreneurial behaviour is optimal and our prima facie impression of socially optimal capacity utilization is wrong; or the prima facie impression of socially optimal behaviour is right and entrepreneurs are irrational; or yet again the socially

optimal capacity utilization is a high level of utilization and entrepreneurs are rational but there are distortions in the markets facing entrepreneurs which explain the shortfall of the private from the social optimum.

Three kinds of factors cause divergence between the private calculus and the public good: 1) the prices at which entrepreneurs maximize; 2) the objective function maximized by entrepreneurs; and 3) non-price factors.

It is well known that for private profit and the public good to coincide in a profit and utility maximizing society, prices must accurately measure marginal social utilities and marginal social costs. Unfortunately, a number of distortions exist in the Latin American price systems which systematically lead privately optimal capital utilization to fall short of the corresponding social optimum. The best known of these distortions relates to the wage rate, which is maintained above the social opportunity cost of labor by a combination of legislation and trade union pressure. The social calculus done at the shadow wage rate will thus naturally lead to higher utilization of labor and therefore a higher preference of more hours worked as opposed to more capital bought, when compared to the private calculus. In addition to the divergence between the market wage and the shadow price of labor, the legislation of wage premia, in those countries in which it exists, further reinforces the distortion against extensive use of existing manpower. Rules on overtime pay and nighttime pay are derived

from precedents in the developed world, international custom, and political pressures and appear to have no relationship to the preferences of the workforce to which they apply. An excess of a market night premium over the shadow night premium would by itself lead to under-utilization of capital; in combination with a basic market wage in excess of the basic shadow wage, that effect is multiplied.[1/]

Distortions also exist on the side of capital. The most well-known of these distortions refers to the ceiling on interest rates, which are held below equilibrium level by a combination of government regulation and rationing. Equally important, however, are the duty exemptions for the import of capital goods, which lower the private price of these below the social opportunity cost of either the savings or the foreign exchange. Further reinforcing this lowering of the price of capital are the tax provisions which allow deduction from the corporate income tax base of part or all of reinvested funds, provided these are put in real assets. Such deductions are equivalent to lowering the purchase price of new equipment to the private buyer, thus creating a further understatement of the cost of capital. As a final twist, many tax legislations specify depreciation of equipment in relation to a fixed lifetime, rather than proportional to use. This

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1/ Note that what is at issue is a comparison between the undistorted supply price of higher shift labor on the part of Latin America's unemployed and the market wage the regulations require paying.

implies that profits deriving from second and third shift output pay a higher effective tax rate than profits from first shift operations, thus distorting the choice between producing an additional shift and expanding the plant.

It is evident that as the private price of capital diverges on a low side from its social opportunity cost, the private decision will tend towards the utilization of more capital-intensive processes and more machines utilized fewer hours compared to what could occur at the proper scarcity prices. Hence on this account also the private decision deviates from the public welfare towards low utilization.

A further element affecting the utilization decision relates to the availability of working capital. Typically, loans are plentiful and cheap for the purchase of capital equipment but expensive and few for the funding of working capital. What is more, in many instances loans are tied to the pledging of real assets. The net effect is to make the intensive utilization of capital either very expensive or impossible and to bias the private decision further towards the expansion of plant and equipment in preference to its utilization.[1/]

Finally, the international trade policy of the Latin American countries with their well known import-substitution and anti-export biases lead to relatively small domestic markets, often served by

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1/ For a detailed analysis of the role of working capital in utilization see Betancourt & Clague (1975c), and Schydlowsky (1974).

tight oligopolies, in which the economies of scale cannot be appropriately exploited. In this situation, the marginal social utility of export sales is well above the marginal private revenue. As a result, exports do not take place and the rate of utilization is artificially depressed compared to the social optimum.

In summary, private profit maximization cannot lead to the maximization of social welfare and to a socially optimal utilization of existing capital stock nor of new, to be installed, capital stock, in view of the major distortions which exist in the price system: the overpricing of labor, the underpricing of capital, the discriminatory taxation of intensive utilization of capital, and the artificial limiting of the size of the market with the consequent underutilization of economies of scale.[1/]

Consider now the possibility of entrepreneurs not maximizing profits. In this case, naturally the coincidence between the private and the public good, even at the optimal prices, need no longer hold. The principal non-profit variables which entrepreneurs appear to be concerned with are two: (i) control over their enterprise and (ii) "tranquility".

1/ It could, of course, be argued that if governments have rigged market prices in Latin America they have good reasons for so doing and hence market prices are optimal. This writer's observation of the policies and how they are generated makes it impossible for him to accept such a view.

Concern with control arises out of two situations. The first of these is concerned with the explicit loss of property rights, the second with loss of quasi-rents. Fear of loss of property has affected utilization in Peru and in Chile. In the former, industrial law specifies a gradual transfer of shares to firms' workers with the consequence of participation of these in management. Under the provisions of the law, reinvestment postpones the time when workers achieve a 50% shareholding As a result, entrepreneurs have great interest in expanding capital stock in order to postpone the day when their workers will be equal owners. This results in the acquisition of new fixed assets in lieu of utilization of existing assets. Furthermore, the incentive to adopt very capital-intensive processes of production within shifts is extremely strong. Finally, the workers themselves prefer expansion of fixed assets and greater capital intensity to expansion of the labor force, since every new worker dilutes the equity of the previously employed. A similar situation arose in Chile under Allende, where firms with larger work forces perceived themselves as being more liable to early takeover than firms with smaller work forces. In consequence, entrepreneurs preferred not to use their capital intensively in order to avoid provoking takeovers.

The second kind of control issue arises in fairly small owner-managed firms in which the technology of production or management is essentially the scarce asset. A good example is shoe production. In these situations, the entrepreneur perceives a continuous danger that his better foremen will set themselves up in business as rivals, and he thus wishes to minimize the amount of information his workmen have access to. This implies an obstacle to decentralization and growth of the firm and naturally an obstacle to multiple shift work since the night shift labor cost of the entrepreneur himself or of his family members is extremely high.

The concern with tranquility arises essentially from labor-management relations. Depending on the institutional framework and the labor climate, entrepreneurs often prefer to keep their firms small and their labor forces decentralized. Thus it appears preferable to a good many of them to have 150 workers spread over three firms with three plants of 50 workmen each, working one shift in each plant, rather than having a single firm with a single plant working three shifts and having the same 150 workers. In the first case, there will be three different unions, each of which can be bargained with separately, whereas in the second case there will be one much more powerful and larger union. The entrepreneur decentralizes his risk and increases his "tranquility" by fragmenting his labor force.

Non price factors are also at work in the utilization decision, and may well contribute a significant explanatory element to the observed situation. A major non-price factor is the problem of minimum scale plants. In many cases it is simply not possible to buy a plant small enough to serve the domestic market on a three shift basis. (In other cases the alternative is between a second hand large plant which is inexpensive and a new small plant which is significantly more expensive. In this case, to buy the large one and underutilize it is better both from a social as well as from a private point of view. It would be even better, however, to buy the large plant and use it intensively, which would require a change in trade policy; exports would have to be profitable. In these situations, however, it is price which is at work). Another non-price element which appears to be important is sheer imitation of the way plants are organized in the more industrial countries. The simple fallacy of "what is good for the industrialized countries is good for us" leads not only to factor proportions inappropriate to the factor endowments of developing countries but also to patterns of

utilization which are more appropriate to capital-rich labor-scarce countries than to the reality of Latin America. Product diversification contributes a causal element as well. Rather than having long production lines of standardized product, small production lines of many products lowers the output obtainable per unit of time. Whereas capital is not idle longer because it produces a more diverse output, it nonetheless is underutilized in the sense that production falls short of the potential. Again, trade policy may well be part of the problem, since greater specialization would be possible only if a greater integration through world trade were achieved.

Social "custom" also hampers night work, since transportation systems and other amenities may not be geared for round-the-clock operation. Evidently, if industry moved massively toward multiple shifting, these services would appear, thus we have here a classic case of pecuniary external economies. Finally two additional non-price factors should be mentioned. The first of these is the phenomenon of building ahead of demand, which indicates a rational decision both in the private and in the public calculus, but where divergencies in both will still arise due to the distortions discussed previously as well as in the discount rate. The second element relates to the transition from the present pattern to one of greater shifting, and refers to the risk inherent in a multiple shift operation. This risk takes two forms, one refers to the physical risk of breakdown of the machines, which is

much more costly if there are fewer machines which produce more output than if there are many machines each of which produces little output. The second relates to the labor problems inherent in having larger work forces and even more to expanding the labor force through the addition of a shift, under conditions where firing of labor may be hard or impossible. Under some Latin American regimes which have legislated labor tenure, the choice of a second shift in an existing enterprise vs. the creation of a new first shift in a new enterprise entails taking on very different risks. Were the expansion of output not to be sustainable, it would be impossible to fire the second shift work crew, however a new firm could be closed down and go out of business. Had the existing firm added a second shift, its first shift profits would be compromised and perhaps the existence of the whole firm would be in question; had it decided to create a subsidiary starting a new first shift, its liability would have been limited due to the normal protection of corporate liability.

The preceding discussion has brought out the wide variety of causal elements that enter into the underutilization of capital in Latin America. It is not surprising that many of the causal factors are there at the same time. Nor is it suprising that there is excess causation of underutilization. After all, for single shifting to occur it is sufficient that it be more profitable than multiple shifting, it is not necessary that it be more profitable

by, say, a factor of five; nor is it necessary that in addition to being unprofitable it be risky, not consistent with "tradition" and not conducive to entrepreneural "tranquility." Once the scales are tipped against the intensive utilization of capital, additional causes do not change the decision, they merely generate over-causation.

The existence of over-causation causes significant difficulties both in identifying the causal structure of idle capital as well as in designing the policy to cope with it. When more than enough causes are present, no single cause or cluster can be identified as "the" cause or causes; we simply know that there are a set of alternatively necessary and collectively over-sufficient causes, many of which are present simultaneously. For policy design, the implication is that as many as possible of the causes should be neutralized by policy, since we do not know which one would be residually operative and sufficient to cause the underutilization. Such a situation can certainly compound the policy design problem. 1/

1/ For a more extensive discussion of these problems see Schydlowsky (1973).

III

Necessary Conditions for the Full Utilization of Installed Capital

Given the fact that capital is now underutilized, what conditions must be fulfilled in order to make full utilization of existing installed capacity possible and, further, to enable newly installed capital to be used more fully as well? The answer involves macroeconomic factors as well as microeconomic firm theoretic ones, since the purpose is to move not just individual enterprises but the whole industrial sector and perhaps some of the service sectors to multiple shifting. Furthermore, there is a distinction to be made between the short run, which involves increasing the utilization of already installed capital, and the longer run which implies a change in behavior on newly added capital stock.

At the macroeconomic level, three necessary conditions must be fulfilled for making the utilization of existing capital possible: a) demand must be available; b) imported inputs complementary to domestic production must be available, c) credit for working capital to finance the period of production must be available.

The availability of demand seems an obvious necessary condition, since without a market additional output could not be sold. At the microeconomic level, it could be argued that competitive firms face no market problem: minimal price reductions would create a market; alternatively, if markets are not competitive then the microeconomic solution is still price reduction.

At the macro level, however, increased output of a major part of the economy is at issue, hence price elasticities are of necessity low; furthermore, cost reductions would not be more than the per unit reduction of depreciation attendant to multiple shifting. Therefore the increase of demand for industrial output produced by price reduction will perforce be low. On the other hand, it is true that where multiple shifting is massively implemented, the new supply will generate some of its own demand, via the so called "Nurkse effect." In other words, additional output arising from multiple shifting will be accompanied by increases in income which will generate increases in demand, some of which will be for precisely those products of which additional output has become available. Whereas in the aggregate expenditure will equal additional income, except for the amounts flowing into monetary savings, such balance does not hold at the sectoral level. There will be excess supply of those items produced by sectors with newly increased utilization of capital, i.e. industry, and there will be excess demand in the sectors for which output has not gone up, principally agriculture (it can be argued that services have a very highly elastic supply curve and hence will respond rapidly to the increased demand). These imbalances in sectoral demands and supplies can best be dealt with if recourse is had to the international market, the excess supplies are exported, and excess demands lead to competitive imports. In turn, such a

solution requires export protection to compensate for the high cost of industrial products in most Latin American countries as well as liberalization of import regulations to allow in the goods necessary to satisfy the excess demand. Since exports as well as imports expand, a balance of payments deficit does not necessarily have to result.[1/]

The availability of imported complementary inputs is an equally obvious necessity for the more intensive utilization of the existing installed capital, since without indispensable raw materials it is not possible to produce. The question becomes one of how to pay for these imports and it is clear that the most immediate and easily available source of such foreign exchange is the sale abroad of part of the output to be produced with those inputs. Hence the need to find a foreign market for the output dovetails very neatly with the need to earn the foreign exchange to pay for the inputs to produce that output. Both supply of output and demand for inputs lead naturally to a very active participation in international trade.

The need of credit for working capital results from the fact that production is not instantaneous, and hence firms hold inventories of embodied factors and raw materials as goods in process. Such goods in process involve the investment of national savings

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1/ See Section VI for a discussion and quantification of BOP effects.

in inventories and rapid increases in their size would ordinarily not be directly financiable by the producing firms themselves. At the same time, the higher level of output will generate higher demand for monetary balances, thus generating national savings in the form of money holdings. The creation of the respective money supply can take place through the extension of credit for working capital, thus neatly transferring the monetary savings to the firms that require those savings for investment in the working capital needed to make increased output possible.

The macro conditions which hold for the short run also hold for a new investment: unless the foreign exchange constraint is removed through a trade policy aimed at active participation in the world markets, particularly one supporting export expansion, it will not be very helpful to depress the capital/output ratio through higher utilization of the investment. The only thing that would happen is that the trade constraint would become even more binding and no change in output would occur, just a shuffling around of the excess capacity from one sector to another. With the elimination of the trade constraint through an appropriate trade policy, however, the full benefits of a lower capital/output ratio and possibly a higher savings ratio can be realized. A shift in investment towards inventories (working capital) is also required for the longer

run.[1/]

On the microeconomic side, two conditions for full utilization of capital are necessary: a) the profitability of such utilization; and, b) the relative unimportance of the non-price factors restricting utilization.

With regard to profitability, in the short run all that is needed is that the revenue from increased output exceeds the costs. This is usually a condition which is easily achieved, particularly if the necessary macroeconomic conditions have been met. The longer run condition is more difficult to achieve, since any expansion of utilization in the short run can be substituted in the long run by a reduction of utilization and an expansion of capital stock. For the long run, therefore, it is necessary to eliminate the distortions that now make expansion of capital stock more desirable than utilization, i. e. the relative profitability of working one, two, and three shifts has to be shifted sufficiently to make two and three shifts more profitable than single shifting. Under the prevalent con-

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1/ Note that a constant ratio of inventories to the input of capital services translates to a higher ratio of inventories to capital stock when utilization is increased. Hence a higher ratio of working capital to fixed capital is a necessary feature of long term higher utilization of fixed capital.

dition of overcausation, it may not be necessary to remove all the separate incentives for single shifting, but enough of them need to be dealt with so that the scales are tipped in favor of multiple shifting.

Some of the non-price factors are dealt with automatically through the side effects of the macroeconomic requirements for utilization. For example, product diversification and a minimal sized plant are dealt with automatically by the increased participation in the world market; externalities are dealt with by the simultaneous introduction of multiple shifting in all of industry. Risk is still a serious problem, however, and may require special treatment, particularly where labor legislation hampering the flexibility of hiring and firing is involved.

Surveying the macroeconomic and microeconomic necessary conditions for full utilization of installed capital brings out the manner in which the existing idleness of capital and labor in Latin America is non-Keynesian: the trade constraint must be removed and domestic price distortions must be dealt with. At the same time the similarity with the Keynesian analysis is also striking: demand must be created, albeit foreign demand, fiscal and tax measures are appropriate and an expansion of the money supply is part of the package. The characterization of the situation as quasi-Keynesian seems indeed appropriate.

IV

The Growth Potential of Capital Utilization

Capital utilization provides two kinds of growth effects: a once and for all effect arising from the intensive utilization of already installed capital, and a continuous growth effect arising from a lower capital/output ratio on new investments planned to work more shifts.[1/]

The mechanism by which the once and for all effect takes place can be very simply stated. The more intensive utilization of existing industrial capital raises industrial output and incomes. The additional output obviously constitutes new supply, whereas the increase in incomes generates increased demand for agricultural and industrial goods and for services. In the absence of a positive and high short run supply elasticity of agriculture goods, the increased demand for such goods translates directly into demand for imports. The increased demand for industrial goods can be satisfied in part by the increased industrial output, but sectoral differences in the composition of supply and demand will lead to net export supply in some industrial sectors and net import demands in others. Finally, the demand for services must be satisfied domestically thus

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1/ When the elasticity of substitution between capital and labor is greater than 1 a multiple shift plant will have a higher capital output ratio than a single shift plant at the same factor prices. A change in the shift pattern usually requires a fall in the wage/rental ratio, hence on balance the capital/output ratio will ordinarily fall.

leading to another round of income, output, and demand creation. The excess supply of some industrial goods will require government support for sale abroad, thus causing some fiscal expenditure. On the other hand, additional imports will signify the collection of new import duties, and the higher levels of domestic income and output will signify higher payments of domestic taxes, both thus offsetting the export subsidies required to make selling abroad possible. The output and income increases which begin in the industrial sectors thus spread very rapidly to the rest of the economy, causing secondary income increases wherever supply elasticities are high, principally in services.

A higher level of utilization of new investment does not have a similarly complex set of macroeconomic interactions; however that higher level of capital utilization may well shift the comparative advantage of the economy, since capital costs are lower under multiple shift operation. Such changes in comparative advantage if they do occur, may well signify major structural changes in the economy over the long run. Furthermore, the policies adopted to achieve the higher level of utilization (e.g. export promotion) will by themselves change the growth path of the economy bringing it closer to that dictated by the underlying comparative advantage of the country.

In order to obtain a sense of the magnitudes of the static, once and for all, contribution to growth which the utilization of

capital can make, it is useful to derive a simple GNP projections model. This model is developed in the following paragraphs and applied to six Latin American countries: Brazil, Chile, Colombia, Costa Rica, Peru, and Venezuela.

We begin by defining the GNP increase (V) as composed of increases in three sectors: increase in agricultural value added (V_A) increase in industrial value added (V_I) and, increase in service value added (V_S).

$$V \equiv V_A + V_I + V_S \qquad \text{(IV-1)}$$

The characteristics of the agricultural sector imply that a significant increase in output in the short run without substantial investment is highly implausible i.e. its "installed capacity" is fully utilized.

$$V_A = 0 \qquad \text{(IV-2)}$$

The increase in value added of the industrial sector is related to the amount of additional shift work as well as to the amount of initial value added being produced under current levels of utilization of capital. Equation IV-3 specifies the increase in industrial value added as a linear function of the existing level of value added and a proportional increase in shifts (S).[1/]

1/ If industry is working currently at 1.25 shifts on the average and if the level of activity is projected to go to two shifts, the value of the shift coefficient will be .6.

$$V_I = \bar{V}_I \cdot S \qquad \text{(IV-3)}$$

In the service sector, it is assumed that any increase in demand must be satisfied from domestic supply, since imports are not usually possible. On the other hand, the supply response to an increase in demand is assumed to be high. Indeed, to the extent that personal services or other highly labor intensive output is involved, high unemployment implies a supply curve of services which is infinitely elastic for a range. Even where some investment is required, it is often possible to raise output by a multiple very rapidly. Such is the case, for example, in construction. On the other hand, for some subsectors of the service sector, such as the generation of electricity, the elasticity of supply is rather low. For the purpose of the model, it has been assumed that the elasticity of supply of the service sector taken as a whole is infinitely elastic. This implies that some investment in this sector will be required to offset the low short run supply elasticity of some of the subsectors. Equations(IV-4) specify this behavior and also note that services have an import component.

$$V_S(1 + m_s) = E_S \qquad \text{(IV-4)}$$

$$V_S = \frac{1}{1 + m_s} E_S \qquad \text{(IV-4a)}$$

where E_S is the new private expenditure on services, m_s is the part of that expenditure which covers the import component of services

expressed as a proportion of the respective national component.

We can now rewrite the increase in total value added as a function of the increases in value added in the industrial and service sectors:

$$V = V_I + V_S = \bar{V}_I \cdot S + \frac{1}{1 + m_s} E_s \qquad \text{(IV-5)}$$

The increase in total of private consumption and investment expenditures is taken to equal the increase in private disposable income, i.e. the increase in total income minus domestic taxes.[1/] In turn, the new private expenditure can be disaggregated into its sectoral components, and the distribution of expenditure takes place in accordance with the respective marginal propensities to spend.

$$E = V(1 - t_1) \qquad \text{(IV-6)}$$

$$E \equiv E_A + E_I + E_S \qquad \text{(IV-7)}$$

$$E_A = e_A E = e_A V(1 - t_1) = c_A V(1 - t_1) \qquad \text{(IV-8)}$$

$$E_I = e_I E = e_I V(1 - t_1) = (c_I + i_I)V(1 - t_1) \qquad \text{(IV-9)}$$

$$E_S = e_s E = e_s V(1 - t_1) = (c_s + i_s)V(1 - t_1) \qquad \text{(IV-10)}$$

$$e_A + e_I + e_s \equiv 1 \qquad \text{(IV-11)}$$

1/ Note that the model therefore excludes both monetary savings and credit. Both could easily be introduced; however the simultaneous exclusion is unimportant as long as bank credit is neutral i.e. neither inflationary nor deflationary.

Note that in these equations the marginal propensities to spend (e_i) are composed of the marginal propensities to consume and to buy for investment purposes the goods originating in the respective sectors. Thus, for example, the expenditure on industrial goods (E_I) is determined by the propensity to consume industrial goods (c_I) and by the propensity to use industrial goods for investment purposes (i_I). The same holds for expenditure on services, since investment has a component originating in the service sector, particularly when construction is involved. On the other hand, the demand for agricultural goods does not include an investment component, due to the particular nature of the goods involved.

Inserting equation (IV-10) in equation (IV-5), collecting terms and solving for the increase in GNP, shows the total increase in value added arising from the more intensive use of existing installed capacity as depending on the initial level of industrial value added, the amount of increased shifting, and a multiplier which reflects the proportion of the new income spent on domestic services. Equations (IV-12) to (IV-13) portray this outcome symbolically.

$$V = \overline{V}_I \cdot S + \frac{1}{1 + m_s} e_s V(1 - t_1) \qquad \text{(IV-12)}$$

$$V = \frac{1 + m_S}{1 + m_S - e_S(1 - t_1)} \bar{V}_I \cdot S \qquad \text{(IV-13)}$$

In empirical applications, it is often difficult to determine the imported input into services and thus it is useful to simplify the formula with the assumption that no complementary imports exist in the service sector.[1/] This leads to the expression shown in equation IV-14.

$$V = \frac{1}{1 - e_S(1 - t_1)} \bar{V}_I S \qquad \text{(IV-14)}$$

It is worth pointing out that the multiplier in this expression has the same rationale as the conventional Keynesian macro multiplier: in that theory, we subtract the marginal propensity to consume because it constitutes that part of income which gets respent; in this model we subtract in the denominator the marginal propensity to spend on services out of disposable income multiplied by the ratio of disposable to total income, i.e. again that fraction of income which will stay in the domestic spending stream and be spent on domestic goods.

To make empirical applications of the formula more readily understandable, it is useful to standardize the increase in value added with regard to the initial levels of GNP. This can be done by

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1/ This assumption is equivalent to having the user "assemble" the domestic and imported components of services.

dividing both sides of equation (IV-14) by the initial GNP level, yielding the following:

$$\frac{V}{\overline{V}} = \frac{1}{1 - e_s(1 - t_1)} \quad \frac{V_I}{\overline{V}} \cdot S \qquad \text{(IV-15)}$$

Table IV-1 shows the parameters necessary for empirical evaluation of the once and for all growth potential for six Latin American countries. It is interesting to note what range of variation exists for the marginal propensities to spend, particularly for agriculture. Evidently, the classification of processed foods as industrial output is a factor reducing the agricultural coefficient, however other factors are surely at work too. The levels of domestic taxation and the shares of industry also differ by large amounts. It is not surprising therefore, that the income multipliers vary as well.

Table IV-2 shows the increases in GNP obtainable by raising shift work to two and three shifts in each of the six countries, and compares these increases to recent per capita growth rates. It appears that for these countries moving to two shifts is equivalent to between one half and five years of per capita growth, whereas moving to three shifts would imply an equivalent of between three and eleven years of growth.

It should be remembered that the foregoing analysis and numerical evaluation refers only to the once and for all impact of utilization.

TABLE IV-1

PARAMETERS ENTERING ESTIMATION OF GNP INCREASES FROM MULTIPLE SHIFTING

1. Marginal Propensities to Spend:

	e_A	e_I	e_S
Brazil	.17	.32	.51
Chile	.128	.4059	.4658
Colombia	.16	.28	.55
Costa Rica	.15	.36	.48
Peru	.14	.40	.46
Venezuela	.18	.32	.50

2. Domestic Taxation, Share of Industry, Average Shift Work.

	t_1	$\bar{V}_I/\bar{V}$	$\bar{S}$
Brazil	.1707	.24	2.01
Chile	.181	.28	1.69
Colombia	.0848	.225	1.67
Costa Rica	.156	.19	1.55*
Peru	.1063	.287	1.69
Venezuela	.045	.171	1.84

(*) Production increases possible without additional shifting imply an equivalence of 1.33 shifts worked on average.

TABLE IV-2

ESTIMATED GNP INCREASES FROM MULTIPLE SHIFTING

SHIFT BASIS:	BRAZIL 2	BRAZIL 3	CHILE 2	CHILE 3	COLOMBIA 2	COLOMBIA 3	COSTA RICA 2	COSTA RICA 3	PERU 2	PERU 3	VENEZUELA 2	VENEZUELA 3
Absolute Increases:												
Industrial VA	14562.	87060	4787.7	20232.0	15340.8	33293.5	773	1928.6	7,739	28,268	828.3	6005.5
Service VA	10673.9	63814	2953.0	12478.9	15555.5	33759.6	324.6	810	5,401	19,731	685.9	4972.6
Total VA	25235.9	150874	7740.7	32710.9	30896.3	67053.1	1097.6	2738.6	13,140	47,999	1514.2	10978.1
Percentage Increases:												
Industrial VA	2.07	12.42	5.16	21.83	8.27	17.94	9.4	23.46	3.75	13.72	1.48	10.78
Service VA	1.52	9.1	3.19	13.47	8.38	18.20	2.95	9.86	2.62	9.58	1.23	8.93
Total VA	3.6	21.52	8.35	35.3	16.65	36.14	13.35	33.32	6.37	23.30	2.71	19.71
Recent per Capita Growth Rate	7.8		-3.1		4.1		3.6		3.0		2.3	
Memorandum:												
Average Shifts Worked	2.01		1.69		1.67		1.55		1.69		1.84	
Income Multiplier	1.7330		1.6168		2.014		1.42		1.698		1.828	
Units in millions of	Cruceiros		Escudos		Pesos		Colones		Soles		Bolivares	
Base Year	1974		1970		1972		1972		1971		1971	

Naturally this once and for all change will raise the base from which future growth will take place and thus will provide a lasting absolute effect throughout time. A further growth effect is obtained, however, through the impact which the full utilization of newly installed machinery will have on the marginal capital/output ratio. The precise impact of such changes depend naturally on the extent of availibility of cooperating factors, on the elasticity of substitution between capital and such factors and on the relative price changes of capital and labor which might accompany the process.

An upper bound of this effect on the growth rate can be obtained by assuming that there is no substitution between capital and labor and that even after all existing capital is fully utilized, unemployed labor will continue to exist i.e. by adopting strict Harrod-Domar assumptions. Under these assumptions, the increase in the growth rate is directly proportional to the change in the capital output ratio resulting from multiple shifting and to the proportion of economic activity affected by such an increase. This can be seen from equations (IV-16) through (IV-21), where g signifies the rate of growth, s signifies the average savings rate, k stands for the output/capital ratio, the subscripts represent before and after, p is the share of industrial value added in total value added, w is the proportional change in the output/capital ratio and the superscripts refer to non-industrial and industrial output/capital ratios respectively. Moreover, w is also the proportionate increase in shift work.

$$g_o = s_o k_o = S_o \left[k_o^{nI} (1 - p) + k_o^{I} (p) \right] \qquad \text{(IV-16)}$$

$$g_1 = s_o [k_o^{nI} (1 - p) + k_o^{I} (p)(1 + w)] \qquad \text{(IV-17)}$$

$$g_1 = s_o [k_o^{nI} (1 - p) + k_o^{I} (p) + k_o^{I} pw] \qquad \text{(IV-17a)}$$

$$g_1 = s_o k_o + s_o k_o^{I} pw = g_o + s_o k_o^{I} pw \qquad \text{(IV-17b)}$$

$$g_1 - g_o = s_o k_o^{I} pw \qquad \text{(IV-18)}$$

$$w = S \qquad \text{(IV-19)}$$

$$g_1 - g_o = s_o k_o^{I} p S \qquad \text{(IV 20)}$$

$$\frac{g_1 - g_o}{g_o} = \frac{k_o^{I}}{k_o} p S \qquad \text{(IV-21)}$$

An evaluation of the value of the maximum growth effect for the six countries previously mentioned is shown in table IV-3. It is clear that the relative size of the industrial sector in the various countries has significantly affected the growth impact. Were it to be ascertained that excess capacity exists also in services, as most likely is the case in view of the extensive underutilization of transportation systems, restaurants, and recreation facilities during the night hours, it might well be that this growth effect

TABLE IV-3

INCREASES IN THE GROWTH RATE DUE TO MULTIPLE SHIFTING

	BRAZIL	CHILE	COLOMBIA	COSTA RICA	PERU	VENEZUELA
Share of industry	.24	.28	.225	.19	.18	.171
Ratio of industrial to total output/capital ratio (assumed)	2	2	2	2	2	2
Proportionate shift increase to two shifts	.25	.185	.198	.5	.205	.087
Proportionate increase in growth rate at two shifts	.12	.1036	.0891	.19	.07	.03
Absolute increase in growth rate at two shifts	1.24%	.17%	.65%	1.3%	.45%	.156%
Proportionate shift increase to three shifts	.875	.778	.796	1.26	.75	.63
Proportionate increase in growth rate at three shifts	.42	.436	.358	.479	0.27	.215
Absolute increase in growth rate at three shifts	4.3%	.7%	2.6%	3.16%	1.63%	1.14%

would rise. On the other hand, if substitution exists in the production function, the fall in the capital output ratio would be less, and if most or all unemployment were absorbed by the utilization of already existing capital, then evidently the growth effect would be even lower.

It should also be borne in mind that the static and dynamic effects interact in view of the change of the base of growth. Table IV-4 shows the income levels at the year 2000 for growth at the current levels of shifting, at two and at three shifts, under the assumptions made in Tables IV-2 and IV-3. It will be noted that the income level after 25 years of growth is more than doubled by triple shifting in four out of six of the countries while it rises 60 % and 80 % in the remaining two.

TABLE IV-4

GROWTH 1976-2000 UNDER SINGLE AND MULTIPLE SHIFTS

	Index of Per Capita Income, Year 2000		
	Current Shifts Pattern	Two Shifts	Three Shifts
BRAZIL	654	901.6	2112.4
CHILE (*)	149	168	238.9
COLOMBIA	273	372	689
COSTA RICA	242	374	691
PERU	209	248	382.2
VENEZUELA	177	188.8	279.5

(*) Based on 1965-1970 per capita growth = 1.6 %
1976 = 100

V

The Employment Potential of Capital Utilization

As is the case with the effects on growth, capital utilization provides two types of effects on employment: there is a once and for all employment effect arising from the utilization of existing installed capacity and there is a continuous cumulative effect associated with the change in the growth path resulting from higher utilization of newly invested capital.

The first of these effects is distributed between the industrial and the service sectors. In industry, employment increases as a direct effect of increased shift work. This effect may be proportional, with no economies of scale with regard to labor, it may be less than proportional, where economies of factor inputs are possible such as in administration and supervision, or it may be more than proportional where the expansion of output requires greater complexity of tasks. Evidently productivity differences in different shifts will also affect the employment generated.

New employment will be generated in the service sector, as a result of the increased output called forth in this sector by the higher level of income generated in industry. This increase in service employment may accompany more intensive utilization of existing capital in these sectors (e.g. transportation, restaurants, banks,

commerce) or may imply expansion of capital stock (e.g. energy). Since the service sector is generally more labor intensive than industry, the importance of the derived employment generated in services should not be underrated.

The effect on employment of a new "multiple shift" growth path is a composite result of several factors. The first of these is a lowering of the capital stock to employment ratio, which occurs as a simple result of the more intensive use of capital. This ratio is to be distinguished from the ratio of capital services to employment, commonly referred to as a capital/labor ratio, which may well be invariant to shift work, and which is related to the capital stock/employment ratio by the coefficient of shift work. A second element affecting the growth of employment originates in the higher absolute and possibly relative level of investment. A third element affecting the demand for labor arises from the change in the marginal product mix. Whereas under current shift work arrangements economic growth is inward looking, under a multiple shift policy the pattern of growth is export led; the attendant trade policy allows growth to correspond more closely to the comparative advantage of the country. This will naturally imply the more intensive use of the plentiful factors and hence a better demand for labor. Finally, the outward looking policy required by a multiple shift strategy will simultaneously attract more foreign private investment and make it more acceptable

to the host country,[1/] thus raising the level of investment and employment even further.

The projection of the employment effects arising from the utilization of the existing capital are best done on a sector by sector basis. For each branch of industry, the following relation will hold:

$$E_2 = E_1(1 + \lambda)$$

$$E_3 = E_1(1 + 2\lambda)$$

where E stands for employment, the subscripts refer to the number of shifts worked and λ is the coefficient of increased employment in an additional shift with regard to the first shift.

In turn, actual employment, E_A, can be defined as follows:

$$E_A = E_1 [1 + \lambda(n - 1)]$$

where n is the number of shifts actually worked.

Increases in employment can now be defined by combining the previous formulae as follows:

1/ In the context of a higher growth rate and of a more broadly based export sector, foreign capital is less of a threat because the alternatives to it are more plentiful than under stagnation and BOP penury.

$$E_i = \frac{1 + \lambda(i - 1)}{1 + \lambda(n - 1)} E_A \qquad \begin{matrix} i = 2, 3 \\ i \geq n \end{matrix}$$

Information on λ, the employment coefficient of increased shifting is not easy to come by. Observations on existing relative size of different shifts is not a fully reliable estimator since under existing conditions, it is often profitable to work with less than full crews in the second and third shift. Furthermore, different capital intensity of different processes often makes it optimal for the entrepreneur under current institutional arrangements to operate some sections of the plant for a single shift but at a larger scale in order to process the second and third shift output of other sections. This is particularly the case in finishing and/or packaging, where the day shift often packages production which has taken place during the afternoon or night shift. Under such circumstances, a comparison of day and night shift is obviously a misleading guide to what would happen if multiple shifting were widely applied. A further source of information is observed productivity of second and third shift workers as opposed to first shift workers. Again, existing practice is not a fully reliable guide to what would occur if multiple shifting were more widely practiced; furthermore, productivity differentials between shifts vary significantly across industries, with most industries showing lower productivity on the second and third shift but some showing higher productivity as well.

Table V-1 shows a projection of increases in industrial employment for six Latin American countries on the assumption that blue

TABLE V-1

ESTIMATED INCREASES IN EMPLOYMENT DUE TO MULTIPLE SHIFTING

	BRASIL	CHILE	COLOMBIA	COSTA RICA	PERU	VENEZUELA
TWO SHIFT OPERATION:						
Increase in Industrial Employment	194,528	111,400	18,424	103,700	156,869	78,990
% of Present Employment	0.5	4.0	2.6	2.1	4.84	2.6
Increase in Service Employment	95,601	318,924	18,989	278,000	110,709	22,758
% of Present Employment	0.25	10.86	2.6	5.5	3.42	.74
TOTAL	290,129	430,324	37,413	381,700	267,578	101,748
% of Present Employment	0.75	14.86	5.3	7.6	8.26	3.34
THREE SHIFT OPERATION:						
Increase in Industrial Employment	987,616	343,400	45,891	225,100	473,000	227,999
% of Present Employment	2.58	12.2	6.4	4.5	14.6	7.43
Increase in Service Employment	571,556	1,347,721	47,385	603,400	427,768	164,993
% of Present Employment	1.49	47.68	6.7	11.9	13.2	5.37
TOTAL	1,559,172	1,691,121	93,276	828,500	900,768	392,992
% of Present Employment	4.07	59.88	13.1	16.4	27.81	12.8

SOURCE OF TABLE V-1

Industrial Emplyment: Country study estimates adjusted to standard size shifts and National Accounts level of industrial output.

Service Employment: based on following employment/value added coefficients

Brazil 23.57 per million Cr. in 1969 prices; Chile 108 per millios Esc. in 1970 prices; Costa Rica 58 per million Col. in 1972 prices; Colombia 76.3 per million Pesos at 1958 prices; Peru 21.68 per million Soles at 1970 prices.

collar labor has an expansion coefficient of 1. The values of the estimated employment creation are staggering: for the medium-sized countries a full second shift is worth one hundred thousand new industrial jobs. Full two shift operation of only industry increases employment by a proportion ranging from less than 1% in large Brazil to almost 5% in Peru and Chile. Three shifts imply employment expansion of from 2.5% in Brazil to almost 15% in Peru.

The projection of increased employment in the service sector is much more difficult, since only an aggregated output projection is usually available. It is necessary therefore to use a single marginal output/labor ratio for the whole service sector taken together and to apply that to the increased output projected as a result of multiple shifting. The respective projections are also shown in Table V-1. It is interesting to note that the volume of employment generated in services is very considerable, in some cases exceeding our estimates for expansion of employment in industry.

The potential combined effect of new industrial and service employment is of such a magnitude as to have the potential for drastically changing the relative scarcity of the primary factors.

VI

Capital Utilization and Balance of Payments and Price Stabilization Policy

When for whatever reason the balance of payments situation is not satisfactory or prices are rising too rapidly, policy typically focuses on the demand side, either depressing aggregate demand to simultaneously reduce imports and demand-pull on domestic goods, or raising the price of imports to choke off the outflow of foreign exchange, even if at the price of a once and for all rise in domestic prices.

It is remarkable, by contrast, that the supply side has received little or no attention. Yet recognition of the supply potential inherent in underutilized capital makes a supply oriented balance of payments policy or price stabilization policy feasible. To counter a balance of payments deficit, the whole of the industrial supply which can be produced with the existing installed capacity is potentially exportable. For a small country which takes its terms of trade as given, exporting then becomes largely a matter of meeting the world price for goods of the respective quality.[1/] To stabilize domestic prices, the additional output can be used to offset existing demand. It is important to assure, however, that the additional income created through the mobilization of

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1/ It is also essential that the exports have a positive value added at world prices, i.e. that the direct and indirect foreign exchange costs do not exceed foreign exchange revenue.

existing capital not increase the demand for goods to an extent which negates the effect of the additional supply. Monetary and fiscal policy have an important role in preventing such an outcome.

It is apparent that a supply oriented balance of payments or price stabilization policy is significantly less painful and costly in welfare terms than a demand oriented policy. Whereas the latter implies deflation and unemployment, the former implies expansion and employment. Whereas the latter requires an addition to savings out of a reduced income, the supply policy at best requires an increased rate of savings out of new income.

From the quantitative point of view, the relationship between additional output, additional expenditure, additional exports and new import demand is of the essence. We will therefore extend the GNP generation model developed in Section IV to explore the implications for the balance of payments and domestic inflationary pressures.

Consider first the balance of payments effects of shift work. Imports of two different kinds will increase: complementary imports (M_1), which are inputs needed for production to go forward; and, competitive imports (M_2) which will supply the excess demand of domestically produced import competing goods. Increase in complementary imports in turn depends on the import intensity of industrial (M_I) and service (M_S) production and increases in the value added in these sectors (V_I, V_S). Competitive imports are composed of competitive

agricultural imports (M_A) and competitive industrial imports (M_I). All these relationships are symbolically shown in the following equations:

$$M = M_1 + M_2 \qquad \text{(VI-1)}$$

$$M_1 = m_I V_I + m_s V_s \qquad \text{(VI-2)}$$

$$M_2 = M_A + M_I \qquad \text{(VI-3)}$$

Note that since by assumption there is no increase in the production of the agricultural sector, the total increase in agricultural demand (E_A) must come from imports. That is shown by equation (VI-4). On the other hand, the situation in industry is more complex. In those industrial sectors in which the new supply exceeds the new demand, which will be typically those sectors in which output has gone up the most, there will be export supply. Under our small country assumption and an export policy appropriate to allow domestic producers to meet the going world market price, this export supply will be equal to new realized exports. At the same time, those sectors in which the new demand exceeds the new supply, which will typically be those sectors in which supply increases were low, there will be new imports. At the aggregate level it is possible to define directly the increase in the balance of trade which results from the newly generated industrial value added as well as from the new derived demand which results from the increased shifting. This is shown in equation (VI-5). Note that the new supply of industrial goods is greater than domestic industrial

value added in view of the existence of an import component in industrial goods. Recall also that all variables are defined at domestic prices:

$$M_A = E_A \qquad \text{(VI-4)}$$

$$(X-M_I) = V_I(1+m_I) - E_I \qquad \text{(VI-5)}$$

The total change in the balance of trade at domestic prices can be derived by appropriately consolidating equations (VI-1) to (VI-5) and using (IV-4). The procedure is shown in equation (VI-6) through (VI-6d). As one can see from the last of these equations, the balance of trade at domestic prices is equal to the difference between the new income generated as a result of the use of shifts (new value added) and the new private expenditure resulting therefrom. This difference in turn is equal to the internal taxes collected on that value added.

$$X-M = V_I\ (1+m_I) - E_I - E_A - m_I V_I - m_S V_S \qquad \text{(VI-6)}$$

$$= V_I - E_I - E_A - E_S + E_S - m_S V_S \qquad \text{(VI-6a)}$$

$$= V_I - E + E_S - m_S V_S \qquad \text{(VI-6b)}$$

$$= V_I - E + V_S(1+m_S) - m_S V_S \qquad \text{(VI-6c)}$$

$$X-M = V_I + V_S - E = V - E = t_1 V \qquad \text{(VI-6d)}$$

To calculate the balance of trade at world prices, it is obviously necessary to deflate exports and imports to their international values by the appropriate subsidy or tariff:

$$(X\text{-}M)_{INTL} = \frac{X}{1+d} - \frac{M}{1+t_2} \qquad \text{(VI-7)}$$

$$= \frac{X}{1+d} - \frac{M_1}{1+t_{12}} - \frac{M_2}{1+t_{22}} \qquad \text{(VI-7a)}$$

$$= \frac{X}{1+d} - \frac{M_I}{1+t_I} - \frac{M_A}{1+t_A} - \frac{m_I V_I}{1+tm_I} - \frac{m_s V_s}{1+tm_s} \qquad \text{(VI-7b)}$$

where t_{12} is the average import tariff on complementary imports, t_{22} is the average tariff on competitive imports, t_I is the average tariff on competitive industrial imports, t_A is the average tariff on competitive agricultural imports, tm_I is the average tariff on complementary imports of industrial inputs and tm_s is the average tariff on complementary imports of service inputs.

Since the model does not separately generate the absolute value of the new exports nor the new imports, it is necessary to derive an approximation to equation (VI-7b), by using the balance of trade at

domestic prices and deflating it directly to international prices on the assumption that the subsidy to new exports will on the average be equal to the import duty on the new imports. The appropriateness of the assumption depends on the particular mix of exports and imports, and the ratio of domestic to world prices reflected by the tariffs or subsidies on the flows involved. For example, if the relatively more competitive products are exported and the less competitive imported, export subsidies will be lower on average than import duties; on the other hand, if FOB values are much below CIF values, a contrary effect will result. The following equations make use of the assumption of equality in the averages of export subsidies and import duties on industrial goods:

$$(X - M)_{INTL} \sim \frac{X-M_I}{1+t_I} - \frac{M_A}{1+t_A} - \frac{m_I V_I}{1+tm_I} - \frac{m_s V_s}{1+tm_s} \qquad \text{(VI-8)}$$

$$\sim \frac{V_I(1+m_I) - E_I}{1+t_I} - \frac{E_A}{1+t_A} - \frac{m_I V_I}{1+tm_I} - \frac{m_s V_s}{1+m_s} \qquad \text{(VI-8a)}$$

The empirical use of equation (VI-8a) presents the difficulty that it is usually very hard to distinguish complementary from competitive imports. Unfortunately, the usual classification of imports into finished, intermediate, and capital goods is not adequate for

our purposes whenever the country produces intermediate goods domestically, since in this case it is necessary to be able to distinguish between imported inputs which compete with domestic production of inputs and imported inputs which do not compete with such domestic production. The inability to disaggregate inputs in this fashion loses importance if one is willing to assume that the average tariff on imports on non-competitive industrial goods is equal to the average tariff on competitive industrial goods and if additionally one assumes the service sector has no imported inputs.[1/] Under these assumptions $t_I = tm_I$ and $m_s = 0$; (VI-8a) then simplifies to:

$$(X - M)_{INTL} \approx \frac{V_I - E_I}{1 + t_I} - \frac{E_A}{1+t_A} \qquad \text{(VI-8b)}$$

We can now make use of the relevant equations from the income generating model to derive an expression in terms of the increase in shifts worked and the initial value added of industry.

$$(X-M)_{INTL} \approx \frac{V_I}{1+t_I} - \frac{(1-t_1)e_I V}{1 + t_I} - \frac{(1-t_1)e_A V}{1 + t_A} \qquad \text{(VI-9)}$$

1/ This is equivalent to supposing that it is the final user who "assembles" the services and their imported input..

$$\approx \left[\frac{1}{1+t_I} - \frac{1-t_1}{1-e_s(1-t_1)} \left(\frac{e_I}{1+t_I} + \frac{e_A}{1+t_A} \right) \right] \bar{V}_I S \qquad \text{(VI-9a)}$$

Whether the balance of payments effect as derived in these equations is positive or negative obviously depends on the respective parameters. Tables (VI-1) and (VI-2) show the values of the parameters for Brazil, Chile, Colombia, Costa Rica and Peru and derived annual balance of payments consequences of going to two and three shifts.

The absolute values of the BOP effects are of an interesting size in all countries except Venezuela; the same holds true in comparison to foreign exchange reserves. Indeed the surpluses for Brazil, Chile, Colombia, Costa Rica and Peru, are of a size which would justify multiple shifting on pure balance of payments grounds. It should also be noted that these figures are conservative since they assume that no effort is made to raise the tax take on the new income generated. Were the domestic fiscal slice larger, the BOP surplus would be higher too.

Consider now the domestic income-expenditure balance. There are two domestic actors in our model: the private sector and the government. The private sector is assumed to spend its disposable income either for consumption or for investment (see eq. VI-6). Monetary savings have been excluded on the assumption that they are offset by new credit creation. The government, however, is not constrained to spend its

TABLE VI-1

PARAMETERS ENTERING ESTIMATION OF BALANCE OF PAYMENTS

	EFFECTS OF MULTIPLE SHIFTING						
	e_A	e_I	e_S	t_1	t_A 1/	t_I	BOP Multiplier
BRAZIL	.17	.32	.51	.1707	.02	.115	.2449
CHILE	.128	.40	.46	.181	.02	.22	.2126
COLOMBIA	.16	.28	.55	.0848	.02	.176	.1222
COSTA RICA	.15	.36	.48	.156	.02	.09	.2397
PERU	.14	.40	.46	.1063	.02	.291	.096
VENEZUELA	.18	.32	.50	.045	.02	.0525	.1113

1/ Assumed value

TABLE VI-2

ESTIMATED ANNUAL SURPLUSES FROM MULTIPLE SHIFTING

($ Millions)

	FULL 2 SHIFTS	FULL 3 SHIFTS	INTERNAT. RESERVES 9/31/74
BRAZIL (1974)	525.1	3139.9	6516
CHILE (1970)	72.9	306.05	-769.22 (*)
COLOMBIA (1972)	104.7	227.3	429
COSTA RICA (1972)	21.8	54.4	13.81
PERU (1971)	19.2	70.1	550.7
VENEZUELA (1971)	20.75	150.5	6415

(*) 1973/Dec.

Source: Internaltional Financial Statistics, I.M.F.

income; if merely pays out export subsidies when needed to bridge the gap between domestic and foreign prices. Whenever the government runs a surplus as a result of shift work, therefore, capital utilization will have an anti-inflationary effect; when there is a deficit, then the effect will be inflationary. The behaviour of the two sectors as described above makes it intuitively plausible for the fiscal surplus/deficit to be the domestic counterpart to the surplus/deficit on the balance of payments. It is useful, however, to formally set out the equivalent.

We can rewrite equation (VI-7) by defining the balance of payments at international prices as the difference between domestic priced exports minus the export subsidy and the domestic priced imports minus the import duty collections:

$$(X - M)_{INTL} = (X - G) - (M - T_2) \qquad \text{(VI-10)}$$

Collecting terms and recalling that the balance of trade at domestic prices is equal to the collection of domestic taxes, (VI-6d), it becomes readily apparent that the balance of payments and fiscal surpluses (or deficits) must be equal.

$$(X - M)_{INTL} = (X - M) + T_2 - G = t_1V + T_2G \qquad \text{(VI-11)}$$

$$(X - M)_{INTL} = T_1 + T_2 - G = T - G \qquad \text{(VI-11a)}$$

Some sense of the potential contribution of capital utilization to stabilization can be derived by comparing the excess supply implicit in the continuous fiscal surplus with the level of GNP. This is done for six Latin American countries in Table VI-3. Evidently these magnitudes are the local currency equivalents of the annual BOP surpluses of Table VI-2. In addition to the annual BOP and disinflationary effects of shift work noted so far, there is a further one time effect resulting from the increase in the demand for money occuring in the transaction period during which income rises to its multiple shift level and additional cash balances are needed to finance the higher level of transactions in the economy. This additional demand for money represents savings which will depress expenditure temporarily, thus causing a one time increase in international reserves and by the same token, one time deflationary pressure.

Table VI-3 shows the once and for all effects arising from the increased demand for transaction balances, on the assumptions of a constant velocity of money in the respective economies and on the further assumption that no attempt whatsoever is made to either tax new income more heavily or to otherwise bring about the sterilization of part of the new income. As can be seen, the magnitudes are by no means inconsiderable.

TABLE VI-3

STABILIZATION POTENTIAL OF CAPITAL UTILIZATION

		ANNUAL EXCESS SUPPLY				ONE TIME EFFECT			
		ABSOLUTE (MILLIONS)		% OF GNP		ABSOLUTE (MILLIONS)		% OF GNP	
		2 Shifts	3 Shifts	2 Shifts	3 Shifts	2 Shifts	3 Shifts	2 Shifts	3 Shifts
(1974)	BRAZIL	3566	21320.	.5	3.04	5301	31696.	.75	4.52
(1970)	CHILE	842.5	3537.3	.93	3.9	869.7	3675.4	.96	4.05
(19_{72})	COLOMBIA	1874.6	4068.5	1.1	2.2	5254.5	11403.6	2.8	6.2
(1972)	COSTA RICA	185.3	462.3	2.3	5.6	219.5	547.7	2.7	6.7
(1971)	PERU	742.9	2713.7	.34	.8	2687.8	9818.3	1.23	2.89
(1971)	VENEZUELA	92.19	668.4	.17	1.26	232.9	1689.0	.43	3.18

VII

Integrated Capital Utilization Policy

The discussion on the over-causation of underutilization of capital contained in Section II as well as the discussion on the necessary conditions for the full utilization of installed capacity contained in Section III, lead directly to the conclusion that capital utilization policy must be an integrated combination of measures with broad coverage to be effective. It is not very useful to aim its impact at a single or a few of the causes of underutilization. Unless most or all of them are tackled simultaneously, utilization may not be made privately attractive. Similarly, unless all the necessary macroeconomic conditions for full utilization are put in place, one or another constraint will make achievement of the goal impossible.

Our proposals for an integrated capital utilization policy fall into five sectors: a) trade policy, b) domestic tax policy, c) monetary policy, d) wage policy, and e) non-monetary incentives. The policies suggested will be found to be mutually reinforcing and in some instances overlapping. In some cases it is possible to point to alternatives within these categories or between them. In most cases, at least one variant within each category must be implemented for the package to be complete. This does not imply "going for broke" since

in most cases it is possible to link the effects of the policy directly to the actual utilization of shifts. Hence to the extent that no increase in shifting takes place, no cost is incurred. Furthermore, as will be seen, most of these policies are desirable on other grounds as well, thus their benefits far exceed their impact on shifting. Let us examine the different policy categories one by one:

a) Trade Policy.

The fundamental goals to be achieved by trade policy are: (i) export promotion, to make the relevant part of the increased output saleable abroad; (ii) import liberalization, to allow in the required inputs and the finished goods essential to absorb the excess demand which will arise in some sectors. In addition, it is desirable to provide stability in the real level of incentives on both sides of the trade balance.

Export promotion can be achieved by a variety of mechanisms. One very simple one is to provide an export subsidy equal to the difference between the domestic and the foreign prices. This type of subsidy is incorporated in the model used for calculations in the preceding sections. It is administratively simple and in a wide range of circumstances it is self-financing.[1/] It has the drawback, however,

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1/ See Schydlowsky (1971) for a discussion of the conditions under which the "full capacity budget" is in surplus.

of infringing GATT rules and of provoking retaliation on the part of trading partners under national anti-dumping regulations.

An effect essentially equivalent to the provision of an export subsidy can be achieved by adopting a "compensated devaluation", consisting of a devaluation of the financial exchange rate and the concurrent adoption of a downward adjustment of import duties and of the imposition of an export tax on those exports which are not to be promoted. In essence this mechanism allows only the exchange rates affecting non-traditional exports and financial transactions to be devalued, since the nominal change in exchange rates for the remainder of the foreign transactions is offset by changes in trade taxation of equal size and opposite direction.[1/] This is again a policy which is fairly easy to implement; furthermore, it is in accord with all international agreements currently in force. It may run into opposition from traditional exporting sectors, however, who would now perceive of themselves as paying an export tax which they were not previously subjected to, despite the fact that they are in reality getting precisely the same amount of units of domestic currency per unit of foreign exchange.

1/ For a detailed discussion see Schydlowsky (1967)

Import liberalization is technically necessary only in countries using quantitative import controls to regulate their foreign trade. Where tariffs are used, no action on the import side is necessary, since at the margin imports are the residual supplier, albeit at a higher price than under free trade. Where quantitative restrictions are in use, liberalization can take the form of relaxing these restrictions or alternatively of linking the export and import sides of the balance of payments.[1/]

The real stability in incentives is best achieved by a crawling or trotting peg, based on the goal of maintaining a constant cost parity between domestic production and imports.[2/]

b) Tax Policy.

The policy goals under this heading again are two: (i) to remove disincentives to multiple shifting and instead provide incentives to do so; and, (ii) to eliminate the subsidy to the use of capital and replace it if at all possible by a tax.

1/ Temporary import regimes such as Colombia's Plan Vallejo solve only the problem of direct complementary imports required for export production. Thus a broader instrument such as the "bonus voucher" in use for many years in Pakistan, seems more appropriate. See Bruton & Bose (1963) for discussion.

2/ If such a solution is not acceptable for one reason or another, the import-export voucher link is a feasible alternative, since the entitlement price will rise automatically as the domestic and world prices diverge, thus maintaining constant the incentives to trade for the goods included in the system.

The instruments to achieve these goals are several. In the first place, the price of capital goods can be affected directly, by abolishing import exemptions for capital goods and instead raising the tariff on imports of such goods and/or putting an excise tax on them. Second, specific disincentive to multiple shifting is constituted by the lack of relationship between the rate of depreciation and the intensity of use of the equipment. Direct proportionality between shifting and the depreciation rate allowable for the income tax calculation would be a simple and effective reform. Third, the availability of tax deductions from corporate income tax whenever new investment takes place, provided the investment is documented by the purchase of fixed assets, is a further incentive to expand the capital stock in preference of utilizing what already exists. Such measures should either be repealed, or if they are regarded as important to promote corporate savings, should be re-drafted so as to count as equivalent to the expansion of capacity the more intensive use of existing capital. Or put differently, the same benefits should accrue to the firm that adds a new shift of production on existing machines as accrues to the firm which expands production with new machines.

Beyond these policies very direct carrot and stick alternatives exist to promote multiple shifting. For example, the basic corporate tax rate can go down for multiple shifters or it can go up for single shifters. Special deductions connected to second shift or third

shift wage bills can be introduced, double or triple depreciation for double or triple shifters can be legislated, etc. To what extent these direct measures are desirable depends in part on what can be done on wage policy and to what extent tax tools must be used to offset the differential between market and shadow wage and between the day and the night shift.

c) Credit Policy.

The policy goal in this case is to offset the strong biases that currently exist both in interest rate and availability of credit for loans connected with the purchase of fixed assets. Indeed, loans for working capital are used essentially to finance inventories of goods in process and of finished goods be they unsold or sold on credit.[1/] These goods consist of embodied raw material, labor and capital, with only the first two requiring financing for the period of porduction and sale. Since the market price of labor is above the shadow wage, it follows that for production from already installed capital, the marginal social cost of goods in process is below the marginal private cost. Hence an argument for the subsidization of credit for working capital can be made. The same argument does not apply to working capital necessary to cooperate with new investments; the relationship between the market and

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1/ A sale on credit is equivalent to moving the merchandise from the seller's to the buyer's warehouse. Until payment occurs, the goods are still in the seller's financial inventory.

shadow cost of goods in process in this case depends on the relative intensity of capital and labor and on the differences between the respective shadow and market prices of these factors.

Since in the short run the major demand for working capital would arise from utilization of existing investment, it would seem appropriate to have a vigorous lending policy for borrowers who wish to increase the utilization of installed capital. One simple policy measure would be to extend to those who "invest in the utilization of capital" the same facilities now available to those who wish to invest in additional real assets. Such loans might well have to require a commitment on the part of borrowers to indeed increase the number of shifts worked by a certain amount within a given period. The policing of such commitments should not be much more difficult than the verification that the appropriate machinery has been bought for new investment projects. Indeed, faced with the certain loss of all credit for non-fulfillment of a commitment to multiple shift, it is unlikely that firms would deliberately default on their obligation.

d) Wage Policy.

The policy goal here again is very clear: to minimize the excess of the market cost of labor over the shadow price, and particularly of the cost of second and third shift labor with regard to its shadow price. Since some reduction in wages is involved, any policy that can be suggested under this heading will encounter significant opposition.

The most promising approach is to make any reduction in benefits accruing to workers only applicable to those not already employed i.e. to have the changes apply only to the new jobs created by the multiple shift policy. The policing aspects of such marginal policies are not unconsiderable, however. Another alternative is to suspend some or all of the social legislation which raises the cost of labor, for a limited period of time and only for new second and third shifters. Finally, the line of least resistence is to transfer the cost of social security and other fringe benefits to the government.

A prime candidate for some type of action is the explicit wage premium, which raises the night wage above the day wage and thus serves to widen the difference between the market and shadow prices of labor even further than during normal working hours. A second and no less important target is the implementation of special tenure rules for second and third shifts, to allow the experimental adoption of shifts. In some countries, it is illegal to fire a worker after the first three months of employment. Under such circumstances, experiments at more intensive utilization of capital are perceived as being risky by the entrepreneur, since he is often not certain that the additional shift will be a lasting one, and thus may find himself in the disagreeable situation of having to cut output but not being able to fire the laborers hired for the new shift.

e) Non Monetary Incentives.

The response elasticity of entrepreneurs to the monetary incentives discussed above is to a large extent determined by the general atmosphere prevailing towards multiple shifting. It is in the creation of that atmosphere that the non-monetary incentives have a major role to play. These incentives may range from preferential access to government services and processing for multiple shifters, through award of decorations for full use of capacity, to lower preference rating on government contracts for single shifters. As a transitory measure, compulsory double shifting can also be considered, certainly on all new investments, but very possibly on existing investment as well. Whereas such a requirement would violate entrepreneurial freedom of choice, a welfare cost would be incurred by the economy only in those cases where single shifting is optimal, which are assuredly quite few. If in addition, compulsory double shifting were not the only measure adopted but were used to reinforce a package of the kind discussed above, the welfare cost of operating under very distorted factor prices and hence wrong factor proportions would be avoided.

VIII

Summary and Conclusion

Underutilized capital coexists with idle labor in Latin America. It takes the form of low shift work, few days worked and underproduction within the hours worked. In terms of shiftwork, only, some 2/3 of the firms in six Latin American countries studied work only one shift. These single shift firms provide about half the industrial employment of the countries, own a quarter of the capital stock and generate over a third of the value added.

Entrepreneurs who do not triple shift are not irrational. They respond to systematic distortions in the price and incentive systems which generate divergence between the private and social optima. Labor legislation, tax legislation, lending rules and policies and international trade policy all have elements favoring single shifting and the use of more machines rather than multiple shifting and economizing of capital stock. In addition, the objectives of the entrepreneur as well as non-price factors are at work to reinforce the tendency to work few shifts.

The coexistence of idle installed capacity with unemployed labor offers a unique opportunity for Latin American countries to get seomething for almost nothing. Generalized two shift operation is worth up to five years of per capita growth; three shifts is equivalent to up to eleven years of growth. The employment effect is in the

hundreds of thousands of new jobs. Full double shifting raises employment by up to 5%, full triple shifting by up to 15%.

Mobilization of the idle capacity is not simple for in addition to motivating the firm to work additional shifts, balance of payments and fiscal constraints need to be borne in mind. However, neither is this task exceedingly complicated: essentially policy must see to it that exports lead rather than follow the process of capacity utilization.

The policies appropriate to achieve stabilization, growth and employment seem in part counter-intuitive and often run against "conventional wisdom". Thus stabilization requires increased government subsidies and expansion of credit, balance of payments improvement is preceded by import liberalization; growth and employment are brought about by taxing capital goods, etc. Yet these recommendations are no more revolutionary than Keynes' prescription to "spend one's way out of the recession". A world of idle factors is a world upside down and the sooner the potential gains of putting capital (and labor) to work are realized, the better.

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