Overinvoicing, Underutilization, and Distorted Industrial Growth

by

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With an artificial exchange rate, a government establishes a set of prices that makes certain transactions highly profitable at the same time that it establishes laws making those transactions illegal. We usually call it "corruption" when people follow the government's *price* incentives instead of its contradictory *legal* incentives. In Pakistan, the dollar sells for 4.75 rupees in the official market but for two to three times that much in the free market. Handsome profits are made by those who can trade in both.

This paper describes overinvoicing of capital-equipment imports in Pakistan industry. Moral dimensions of the problem are not at issue. The central question is how overinvoicing affects the allocation of investment and, therefore, the structure of industry — how (and by how much) overinvoicing changes the costs of capital to the men who make investment decisions[1]. The logic of the problem can be developed with simple equations but an understanding of overinvoicing and its consequences does not depend on algebra. The reader who finds equations more a hindrance than a help can omit them and still get a clear sense of the shape and magnitude of the problem.

For those unfamiliar with the system, overinvoicing works like this: an industrialist whose new factory has been sanctioned (*i.e.*, approved officially) will arrange with a foreign supplier to sell him equipment at a fictitious invoice price, higher than the price he actually pays. Presentation of the partly fictitious invoice to the foreign-exchange authorities entitles the industrialist to buy the full invoice amount of foreign exchange at the official rate of 4.75 rupees to make payment. The portion of the invoiced amount that represents overpayment is

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[1]After completing this paper, I discovered Bhagwati's analysis of the statistical and financial problems created by faking foreign trade declarations [1]. It is nicely complementary, both in generalizing the devices and incentives for faking invoices — over- and underinvoicing of imports and exports — and in analysing their impact on real and apparent balance-of-payments accounts. On the subject of this paper, however, Bhagwati does not touch.

then deposited by the supplier to the industrialist's account in a foreign bank and, because of the disequilibrium exchange rate, it can be sold for rupees at the higher black-market rate. Therein lies the foreign-exchange profit to the industrialist. The deception of overinvoicing, of course, is necessary because the government has made it illegal for anyone openly to trade foreign exchange between the official and the black markets.

Part I devises a way to measure the incentive effects of overinvoicing through the financial — foreign-exchange market — profits that reduce the real costs of capital equipment to the industrialist. The size of these financial profits is estimated for Pakistan since they will affect investment behaviour only if they are not trivial. In Part II, the impact of overinvoicing profits is expressed, alternatively, as the effective exchange rate for capital imports that includes both tariffs and the subsidy of overinvoicing profits. Finally, Parts III, IV and V consider the price distortions that overinvoicing creates among capital goods and what these imply for industrial development and performance, for foreign-capital intensity, capital utilization and employment and output growth.

The facts and estimates in this paper are Pakistani, but the forces described apply to any underdeveloped country with an overvalued domestic currency. Overvaluation creates the incentives to overinvoicing capital imports and competition among foreign-equipment suppliers assures dissemination of the techniques of overinvoicing. So misallocation of investment due to overinvoicing of capital imports is one among the many development problems of distorted industrial incentives created by an artificial exchange rate [2;3;12].

I. THE FOREIGN-EXCHANGE PROFITS OF OVERINVOICING

In overinvoicing, a real transaction (the purchase of equipment[2]) is used as the vehicle for a financial transaction (the purchase of cheap dollars for resale in the black market). These are two sides of the same coin, of course, but it is helpful at first to separate them and look *only* at the financial transaction — at the profit earned through the foreign-exchange purchase and sale. It is important to note that we are completely disregarding any profit the industrialist may expect to earn on products made by the equipment. In order to see the magnitude and effects of the financial incentives alone, we are explicitly ignoring what is usually taken to be the *only* reason for importing capital equipment — expected operating profits[3].

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[2]"Equipment" is used to emphasise that the analysis deals with real capital investments. But it applies equally to nontangible imports of services that go into an investment budget — consultant and engineering services being the most obvious.

[3]A more general analysis of allocational distortions of overinvoicing would have to recognize, in addition to financial profits and operating profits, the trading profits possible from reselling licence-restricted imports at a domestic price higher than landed costs plus tariff [8; 11]. If trading profits were sufficiently large and licences were issued for a limited total value of import, there would be an incentive to *under*invoice the imports and *buy* black-market foreign exchange to pay the excess of actual overinvoiced value [1]. The reason for ignoring this possibility here is simply that a small part of industrial investment in Pakistan can be resold, hence trading profits do not figure prominently in investment-allocation decisions.

The amount of financial profit (in rupees) from an overinvoiced capital-goods import is simply what the industrialist earns by selling his Swiss bank deposit on the black market, less what he paid for it. So,

$$\Pi^r = E_b \ (C_i^\$ - C_a^\$) - (1 + t) \ E_o \ (C_i^\$ - C_a^\$) \dots\dots\dots\dots\dots\dots\dots(1)$$

where the first term is proceeds (the amount earned by selling the overinvoiced dollars $(C_i^\$ - C_a^\$)$ at the black-market exchange rate, E_b) and the second term is costs (the amount paid to buy $(C_i^\$ - C_a^\$)$ of dollars at the official exchange rate, E_o, given that he has to pay the tariff, t, on the fictitious part of the import too[4]). The invoiced value of the import is $C_i^\$$ while the amount actually paid to the supplier is $C_a^\$$, so the difference is the number of dollars accumulated through overinvoicing[5]. Superscripts indicate dollars ($) or rupees (r). If the amount of overinvoicing is expressed as a fraction of the invoice value, we can deal with

$$\emptyset = \frac{C_i^\$ - C_a^\$}{C_i^\$}$$

and in these terms, financial profits can be expressed simply as

$$\Pi^r = \emptyset \ C_i^\$ \left[E_b - (1 + t) \ E_o \right]$$

or in rupees

$$\Pi^r = \emptyset \ C_i^r \ \left[\ E_b/E_o - (1 + t) \ \right] \dots\dots\dots\dots\dots\dots\dots\dots\dots(2)$$

This is a most useful result. The industrialist's profit depends (quite sensibly) on the fraction of the invoice that is fictitious, on the size of the equip-

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[4]For some imports, Pakistan uses a system of bonus vouchers [4] to achieve a partial devaluation. Its application to capital-goods imports would modify (1) to the extent of

$$\Pi^r = E_b \ (C_i^\$ - C_a^\$) - (1 + t + bv) \ E_o(C_i^\$ - C_a^\$)\dots\dots\dots\dots\dots\dots\dots(1')$$

where v is the premium paid for dollars bought with bonus vouchers and b is the proportion of the invoice value that must be paid in those dollars (currently 0, 1/2 or 1 for different imports). Since $0 \leqslant b \leqslant 1$ and $0 \leqslant v$, profits from overinvoicing would be reduced by an increase in the bonus-voucher premium and/or the proportion of invoice value for which bonus dollars must be bought — an effective devaluation. These complications have been ignored in the text simply because most new capital equipment is imported outside the bonus-voucher system (b = 0) and the system applies almost exclusively to spare parts, maintenance and balancing equipment compounding the skewing of prices discussed in detail in Part V below. In considering corrective policies, of course, "devaluation" should be read to include *de facto* devaluation through sufficient increases in b and v applicable to all capital goods.

[5]Interest payments do not appear in these costs—despite the fact that the industrialist must pay interest on a loan for capital imports — because their relevance depends on the particular time pattern of costs and payments from overinvoicing. To the extent that the two parts of the transaction (commitment of rupees and acquisition of dollars) are separated by a short time, any interest charges paid to borrow rupees are offset by the interest earned on the dollar deposits. Only in the interim period when rupees have been committed but dollars are not yet secured is the interest rate relevant and there is no evidence that this period is considerable (or even that it exists).

ment order, on tariffs and on the spread between black-market and official rates of exchange. Notice that if the government did not maintain an artificial exchange rate, overinvoicing profits would be eliminated — an official exchange rate within $(1+t)$ of the black-market rate (so $E_b = (1+t)E_o$) would make Equation (2) equal zero.

Profits affect behaviour. It is unimportant to the analysis of overinvoicing whether industrialists in an underdeveloped country "maximize" profits in some purists' sense. What is important is that the promise of higher profits creates incentives — pressures — to which some industrialists may well respond all the time and all industrialists will respond some of the time. We can understand important, perhaps dominant, pressures on industrialists' investment behaviour if we understand what influences profits. Among the determinants of profits, we shall discuss, some apply to areas within the firm's discretion; some apply to industry as a whole; some work only through government policy and the incentive of the industrialist is to influence that policy.

Profit Incentives

On the simplified level represented by Equation (2), the drive for profits through overinvoicing creates among industrialists incentives for the following behaviour:

Industrialists will try to

1) make the amount of sanctioned industrial investment (C_i^r) as large as possible. This has two corollaries:

a) encourage inflows of foreign aid, discounting its high social cost, since these largely determine the amount of total industrial capital imports, and

b) for any one individual or firm, *increase his share of sanctioned investment* from a given amount of foreign aid.

2) increase the fraction of overinvoicing ($\varnothing$) on capital imports. Even if we assume that this fraction is determined by "common business practices" and is constant between different kinds of capital imports (an assumption examined below), there is still an incentive to increase the overinvoiced proportion over time. Competition among suppliers will contribute to this.

3) maintain or increase the disparity between the official and black-market rates of exchange (E_b/E_o). This has two elements, that

a) devaluation should be resisted by whatever argument has political appeal (national pride [2], threat to industrial development, inflation[6]), and

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[6]For a highly imaginative (if not always consistent) list of reason to resist devaluation, *see* [10].

b) the black-market price should be maintained or increased by encouraging enforcement of foreign-exchange controls on other suppliers of black-market dollars[7].

4) *discourage tariffs on capital imports* since they directly reduce financial profits by increasing the cost of getting dollars through overinvoicing. The most persuasive argument within the compass of the industrialists would be that there is a severe limit on the ability to create projects that will use available foreign exchange — an "absorptive capacity limit" — so that higher tariffs would radically reduce industrial development.

Estimated Profits

Just how strong these pressures are likely to be on the typical Pakistan industrialist depends on how much these variables affect actual profits — quantities have to be substituted for the symbols of Equation (2). We can estimate two figures: the rate of profit that business overinvoicing practices created in Pakistan four years ago (1966); and the rate of profit that business practices now generate (1970).

a) The typical magnitude of overinvoicing ($\emptyset$) that prevailed in 1966 was 10 per cent of the invoice price, the black-market rate of exchange (E_b) was about 10 rupees to the dollar for these highly liquid funds[8], and the official exchange rate (E_o) was 4.75 rupees. The average tariff rate on capital-equipment imports was 34 per cent [7]. Substituting these values into (2), the rate of purely financial profit on a capital import in 1966 was 5.8 per cent[9]. This is solely profit from overinvoicing and foreign-exchange market manipulation. On the import of an invoiced 1,000,000 rupees of foreign capital equipment, the financial profit earned by an industrialist taking advantage of overinvoicing was 76,514 rupees. An investment worth 1,340,000 rupees would be recorded officially $\left(\text{as } (1+t)C_i^r\right)$ but it would represent an actual import of 900,000 rupees of equipment.

b) In 1970, both the typical level of overinvoicing and the black-market rate for highly liquid dollars has increased significantly. Estimates of 20-per-

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[7]How this works depends on the interaction between official and black markets — whether the total supply of dollars is fixed or whether the black market itself leads to price elasticity [1]. If the supply of available foreign exchange is increased by increased black-market activity, then "too much" black-market activity will lower the profit of overinvoicing. There is always an "optimum degree of enforcement" for the law-breaking firm [13].

[8]Which sell in large amounts, are untraceable, and are not subjected to any national capital-flow restrictions. So they are more valuable than London or New York dollars.

[9]It is not clear what the denominator of a profit rate from overinvoicing should be. The absolute amount of profit is as stated in (2), but should this be measured against the actual value of the capital (C_a^r), against the invoiced value (C_i^r), or against the total resources the industrialist has to commit to the transaction including invoice payment and tariffs on it all $\left[(1+t)C_i^r\right]$. The estimates in the text are conservative; they are based on the largest of these defensible denominators (the last) so the reader who would choose a different base for calculating profit rates will increase the estimates (significantly).

cent overinvoicing ($\emptyset$) and a free-market exchange rate of 15 rupees to the dollar (E_b) are not extreme[10]. The official exchange rate (E_o) still stands at 4.75 rupees. Average tariffs on capital imports have risen to about 40 per cent[11]. Substituting these values into (2), the rate of financial profit from overinvoicing becomes a remarkable 25.1 per cent. Now importing 1,000,000 rupees of invoiced capital goods earns a financial profit of 351,540 rupees. The investment worth 1,400,000 rupees in the official record represents capital goods with an actual pre-tariff value of 800,000 rupees.

These estimates of overinvoicing profits suggest that opportunities for overinvoicing capital goods may be terribly important in underdeveloped countries in creating conflicts of interest, political pressures and incentives that lower the price of industrial capital, systematically affecting its allocation and encouraging its waste. We shall return to this below.

II. THE EFFECTIVE EXCHANGE RATE FOR CAPITAL IMPORTS

An alternative way to describe the distorting effect of overinvoicing is through the implicit exchange rate that applies to imports of capital goods when overinvoicing profits reduce the real rupee costs of capital. Tariffs increase the implicit exchange rate; overinvoicing profits reduce it. The real rupee cost of imported capital is

$$C_f^r = (1 + t) E_o C_a^\$ - [E_b (C_i^\$ - C_a^\$) - (1 + t) E_o (C_i^\$ - C_a^\$)] \dots\dots(3)$$

The first term describes the gross costs of the real transaction (buying the equipment) while the second, bracketed term, describes the (offsetting) financial profits. Simplifying this expression gives

$$C_f^r = \frac{C_a^\$ [(1 + t) E_o - \emptyset E_b]}{(1 - \emptyset)} \dots\dots\dots\dots\dots\dots\dots\dots(4)$$

as the real rupee cost of capital to the industrialist.

The implicit exchange rate for capital imports is derived simply by dividing the real rupee cost by the actual dollar cost of the same equipment, so

$$C_f^r / C_a^\$ = \frac{(1 + t) E_o - \emptyset E_b}{(1 - \emptyset)} \dots\dots\dots\dots\dots\dots\dots\dots(5)$$

[10]It can be questioned whether 15 rupees to the dollar is a reasonable black-market rate for even these highly liquid funds. In fact, it does not matter much to the argument whether it is. An estimate of 13 rupees gives a 1970-overinvoicing profit rate of 19 per cent and an effective exchange rate for capital imports of 5.06 rupees to the dollar, both of which still give dramatic evidence of the incentive effect of overinvoicing. The reader who would try the impact of other black-market rates of exchange can readily do so. In Table I, a column has been added to show the effect of a black-market rate of 13 rupees in 1970.

[11]There have been no careful estimates of the average tariff on capital goods since those for 1966. The rate on most capital goods has risen since then from a nominal 40 per cent to a nominal 50 per cent at the same time that the number of exceptions for which a 30 per-cent rate applies (largely to spread regional distribution of investment) has increased. The net effect of these contradictory movements is estimated as 6 per cent, raising average tariffs on capital-goods imports to about 40 per cent.

is the effective exchange rate for capital imports that should be compared to other exchange rates in the economy (those applying to consumption goods and raw materials) and to other prices (labour, domestic materials) to judge the relative price of foreign capital. Notice again that in the absence of an artificial exchange rate, $(1 + t)E_o = E_b$ and the right-hand side of (5) reduces to $(1 + t) E_o$, making the implicit exchange rate the same as the official exchange rate plus tariff. The overinvoicing distortion (and incentive) vanishes.

Estimated Effective Exchange Rate for Capital Imports

As with financial profits, two sets of estimates of the effective exchange rate are possible; one for 1966, other for 1970.

a) Using the figures that describe 1966 business practices, Equation (5) gives an effective exchange rate of 5.96 rupees per dollar. So the industrialist taking advantage of overinvoicing in 1966 paid for imported capital at an exchange rate lower than the one derived from tariffs alone — 6.37 rupees was used by Lewis [7].

b) But using figures describing 1970 practices, the effective exchange rate for capital goods falls to 4.56 rupees per dollar and this of course includes the 40-per-cent average tariff rate. So despite tariffs, the effective exchange rate for capital-goods imports in Pakistan appears to be below the official rate. The subsidy effect of overinvoicing is larger than the tariff; the net "tariff" is —4 per cent.

Because devaluation is an obvious way to eliminate overinvoicing profits (directly or through bonus generalization), it is interesting to ask what amount of devaluation is implied by these estimates. Mechanically applying the conditions of 1970 to Equation (2), a devaluation to 10.71 rupees would eliminate the profits from capital overinvoicing. But this is probably a slight overestimate of the required devaluation for two reasons: *i*) the existing black-market rate is likely higher, given restrictions on exchange transactions, than an "equilibrium rate" would be; and *ii*) there are administrative costs of overinvoicing that we have (properly) ignored.

These estimates of Parts I and II are summarized in Table I for an import of 1,000,000 rupees of invoiced value.

III. THE EFFECT ON THE CHOICE BETWEEN IMPORTED AND DOMESTIC CAPITAL GOODS

Not all capital is imported, of course, and the industrialist always has some choice in the import content of his investments, either through choosing the way a product is made or, if not there, simply in the choice of which products

TABLE I

THE IMPACT OF OVERINVOICING ON THE COST OF CAPITAL-GOODS IMPORTS

(for Rs. 1,000,000 of imports)

		1966	1970	1970[a]
1.	Invoiced value (C_i^r)	1,000,000	1,000,000	1,000,000
2.	Nominal cost $[(1 + t)\, C_i^r]$	1,340,000	1,400,000	1,400,000
3.	Financial profit from overinvoicing Π^r	76,514	351,540	267,400
4.	Payment to supplier (C_a^r) (*rupees*)	900,000	800,000	800,000
5.	Payment to supplier ($C_a^\$$) (*dollars*)	189,474	168,421	168,421
6.	Real rupee cost (C_f^r)	1,129,265	768,000	852,631
7.	Effective exchange rate ($C_f^r/C_a^\$$) (*rupees per dollar*)	5.96	4.56	5.06
8.	Tariff (+) or subsidy (—) re. official-exchange rate	+25.5%	—4.0%	+6.6%

[a]The impact of overinvoicing profits in 1970, if 13 rupees is assumed to be the black-market rate of exchange. *See*, footnote 10 above.

to make[12]. Using the subscript d to indicate domestically supplied capital, the total nominal cost of an investment project (or a group of investments making up an investment (budget)) with both foreign and domestic component is

$$C^r = C_d^r + (1+t)\, C_i^r \,.$$

If we describe the choice between imported and domestic capital goods by the relative size of the imported component of investment

$$f = C_i^r/C_d^r$$

then

$$C^r = C_i^r\left[(1+t) + \frac{1}{f}\right]. \quad\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (6)$$

[12]The usually weak assertion that there is no choice of import coefficients in industrial development is indefensible unless all industries have fixed coefficients, all coefficients are identical, and all industries operate at the same level of utilization [6 ; 16].

Earlier we showed profits as a function of the nominal value of foreign capital, C_i^r, (among other things) so we can solve that earlier Equation (2) for C_i^r and substitute the result into (6) to get a total investment cost of

$$C^r = \frac{\Pi^r \left[(1+t) + \dfrac{1}{f} \right]}{\emptyset \left[E_b/E_o - (1+t) \right]}. \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(7)$$

This, in turn, can be solved for Π^r so that total financial profit from overinvoicing becomes

$$\Pi^r = \frac{C^r \emptyset \left[E_b/E_o - (1+t) \right]}{(1+t) + \dfrac{1}{f}}. \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(8)$$

It is clear that total profits depend, as before, on the size of the investment budget, on tariffs, on the amount of overinvoicing and on the black-market rate of exchange relative to the official market rate. What is added by (8) is that profits depend, too, on the amount of imported capital. For any given investment budget, the industrialist's profit is higher the larger the proportion of imported capital used — *i.e.*, the less is the use of domestically produced capital goods.

Incentives

In addition to the profit incentives described in Part I, *industrialists will try to*

5) *increase their use of imported capital equipment* which can be done both

a) *by selecting foreign capital-intensive techniques of production* and

b) *by investing in those industries that use much foreign capital* at the expense of those that use little.

Estimates

For the second-plan period (1960-65), Naqvi has collected data on total sanctioned private investment and the amount of it that was made up of foreign capital [9]. So from these, f can be computed for Equation (8) as well as the effect on profits of changes in f. It should be remembered that the same rupee profits that were earlier expressed as a per cent of the cost of foreign capital alone (*see* footnote 9) are now expressed as a per cent of total capital cost so the percentage on this larger base must necessarily be smaller.

Using the values for 1970, the rate of overinvoicing profit on total investment is 16.4 per cent for West Pakistan and 15.4 per cent for East Pakistan. The sensitivity of these profit rates to changes in the proportion of foreign capital is

illustrated if we assume a change from half imported capital/half domestic (f=1) to two-thirds imported/one-third domestic (f=2)[13]. Such an increase in imported capital would cause the rate of financial profit on total investment to rise from 14.65 to 18.51 per cent. So in this range, doubling the proportion of imported capital increases the financial profit rate by 3.9 percentage points. Profits are 26 per cent higher[14].

IV. THE EFFECT ON THE CHOICE BETWEEN EXPANDING CAPITAL OR UTILIZING EXISTING CAPITAL

The last steps in the analysis recognize that the amount of overinvoicing depends on what kind of capital equipment the industrialist imports. Earlier, we dealt with the fact that this fraction ($\emptyset$) changes over time; now we consider different fractions of overinvoicing among different classes of equipment at one point in time. The fictitious portion of an invoice will vary because of differences in bargaining power between buyer and seller for different goods and because of differences in the effectiveness of surveillance by the foreign-exchange control authorities between different capital goods. The first of these is treated here; the second in Part V.

Capital equipment can be bought either to build new plants or, alternatively, to maintain and balance existing plants increasing the level of their utilization. For any industrialist (beyond the neophyte with his first investment) there is a choice to be made in dividing an investment budget (C^r) between expansion (C_e^r) and utilization (C_u^r),

$$C^r = C_e^r + C_u^r .$$

The result of the investment allocation can be described by the size of investment spending on utilization relative to spending for expansion,

$$u = C_u^r / C_e^r$$

so that

$$C^r = C_e^r (1+u) = C_u^r (1+1/u) \dots\dots\dots\dots\dots\dots\dots\dots\dots (9)$$

These two types of capital goods should be treated differently as regards overinvoicing profits because of the very different competitive position of the industrialist *vis-a-vis* the equipment seller in the two purchases. A new investment is typically self-contained, technically independent of existing capital

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[13]These bracket the values of f from Naqvi's figures which are 1.35 for West Pakistan and 1.13 for East Pakistan.

[14]Since the elasticity of the profit rate with respect to f is $\dfrac{1}{(1+t)f+1}$, the sensitivity

of profits to f declines as tariffs rise and as the proportion of foreign capital increases. "Early" increases in the import coefficient of investment, therefore, are more powerful than the same proportional increases from a larger base.

except through product flows. If these are pretty much the same from different brands and configurations of equipment, the industrialist is free to choose among suppliers and this freedom will lead to competition among suppliers that appears in part in the amount of overinvoicing. In contrast, the industrialist seeking balancing equipment has less freedom since the equipment must fit into án existing plant, maintenance organization and parts inventory and this relative absence of competitive flexibility to choose among suppliers will show up in lower overinvoicing. So the overinvoicing that can be had on new capital is likely to be greater than that which can be had on capital to increase utilization of existing plant, or formally,

$$\varnothing_e \geqslant \varnothing_u \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(10)$$

An industrialist's financial profits from overinvoicing will, thus, be a weighted average of the profits from each kind of investment spending, the weights depending on the relative rates of overinvoicing on expansion capital ($\varnothing_e$) and maintenance-balancing capital ($\varnothing_u$) and on the distribution of investment between these two (u). Substituting from (9) into (8) for each type of capital investment separately and adding them together gives overinvoicing profits of

$$\Pi^r = \left[\frac{1}{1+u}\,\varnothing_e + \frac{u}{1+u}\,\varnothing_u\right]\frac{C^r\left[E_b/E_o - (1+t)\right]}{\left[(1+t) + \frac{1}{f}\right]} \cdot \quad \dots(11)$$

Despite the cumbersome appearance of (11), it is clear that if the rate of overinvoicing is higher for new expansion investment, profits are increased by decreasing the allocation of investment for *using* the existing capital stock.

Incentives

Industrialists will try to

    6) devote as much investment as possible to new equipment to expand the capital stock and, *as a* concomitant, *as little as possible to maintenance and balancing equipment to increase the utilization of existing capital.* In fact, incentives in this direction are even stronger than implied since in Pakistan some spare parts are imported on bonus vouchers, increasing effective tariffs and likely eliminating most prospects of overinvoicing profits from these imports while leaving expansion investment largely unaffected.

Estimates

    If we assume, arbitrarily, that new capital can be overinvoiced by 20 per cent while maintenance and balancing capital is overinvoiced at 10 per cent under the conditions assumed for 1970, the rate of profit would be 25.11 per cent for the imported new investment and 12.6 per cent for maintenance and balancing investment. If all other factors were comparable, an industrialist who spent

nothing out of 1,000,000 rupees of capital imports for maintenance and balancing ($u=0$) would earn 251,100 rupees on overinvoicing profits while another who spent half his investment budget on increasing utilization of existing capital ($u=1$) would earn only 188,250 rupees. These are suggestive of the price incentives that induce firms to expand industrial capacity rather than increase its utilization.

Such price incentive — along with the general cheapness of capital we have described — may go far to explain why, in capital-scarce West Pakistan, existing industrial capital is used 33 per cent of the time while in the capital-rich United States, it is used 50 per cent of the time[15]. Where capital is scarce, it is wasted; where it is abundant, it is conserved. This is a paradox of no small significance for a poor developing country.

V. THE EFFECT ON CAPITAL COMPLEXITY, INDUSTRIAL EMPLOYMENT AND OUTPUT GROWTH

Overinvoicing operates despite surveillance by the foreign-exchange authorities. In Pakistan, engineering-price committees serve in the major agencies involved in capital-import transactions[16] to scrutinize capital invoices and challenge the validity of those considered suspicious. If surveillance fell with an absolutely even hand on all capital imports, it would concern us only as part of the optimum enforcement of exchange-control laws. But it cannot. These agencies have limited resources and must concentrate their efforts where they are most effective. This means that surveillance is heaviest where over-invoicing is most likely to be discovered and this inevitably is on imports of standardized kinds of capital equipment for which there is a well-established world market. Surveillance is least effective on highly complex modern plants that are tailored to a specific installation and user. For these, the task of accurately validating capital prices is beyond the competence of even the best intentioned price-surveillance group[17]. What gives this economic significance is that the complexity of equipment that makes surveillance of capital imports more difficult involves a high proportion of capital relative to labour and relative to output and, in all likelihood, a bias toward large-scale installations. So the overin-

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[15]Based on Foss' estimates of US capital use [5], adjusted for comparability with my estimates for Pakistan [15]. The details of comparison are included in a forthcoming paper.

[16]Which are Customs, Pakistan Industrial Credit and Investment Corporatio n (PICIC) and the Industrial Development Bank of Pakistan (IDBP).

[17]And scholars. Engineering complexity of capital imports combines with illegality to make it impossible to verify or deny the parameters of overinvoicing reported off the record by industrialists, bankers, foreign-exchange authorities, aid officials and others. Bhagwati's experience in investigating faked invoices in Turkey and India was much the same as mine in Pakistan though his concern with balance-of-payments aspects of faking allowed him one independent rough measure of total magnitudes [1, p. 66].

voicing attainable on new equipment imports ($\varnothing_e$) increases as the capital-labour ratio, the capital-output ratio and project size increase[18].

Incentives

Industrialistis will tend to

7) *select investment projects and sectors that are as complex as possible* though this typically involves *more capital per labourer and per unit of output.* Overinvoicing profit incentives thereby *reduce employment creation and output growth* in industry.

VI. THE IMPLICATIONS FOR INDUSTRIAL DEVELOPMENT

Of the many ramifications of overinvoicing for economic development, three seem of central importance.

A) The structure and growth of industry is affected seriously by the lowered general price of scarce capital equipment and by the distortions of relative prices among types and uses of capital[19].

The problems created by *generally* low capital prices in poor, capital-scarce countries have worried some economists for a long time and they are only compounded by overinvoicing. They rest on the fact that capital with a too-low price relative to its scarcity is wasted — it is used in place of abundant factors (notably labour), it is left idle too much of the time, and it makes the wrong products appear profitable. To this, analysis of overinvoicing adds a better sense of just how low capital prices really are — and a sense of how tariffs can effectively be circumvented by changing the practices of overinvoicing (as in the estimate that overinvoicing in Pakistan more than offsets the existing tariffs on capital imports providing a 4-per-cent subsidy to foreign capital at the official exchange rate). Capital appears to be a good deal cheaper to the industrialist than we had thought.

The distortions *among* capital prices that are created by overinvoicing are more interesting both because they have not previously been indentified and

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[18]This bias in favour of large, complex, capital-using, labour-saving technologies and sectors can be represented by substituting

$$\varnothing_e = g(K/L+, K/Y+, P+)$$

into the earlier statement of overinvoicing profits to get

$$\Pi^r = \left\{ [1/(1+u)]g(K/L+, K/Y+, P+) + \varnothing_u u/(1+u) \right\} \frac{C^r [E_b/E_o - (1+t)]}{(1+t)+1/f} \dots (12)$$

which is as detailed a formal representation of overinvoicing as we shall attempt.

[19]There is a third statistical distortion in the overstatement of industrial investment 'hat overinvoicing produces. This is significant when overinvoicing practices change as in Pakistan between 1966 and 1970.

because they appear in part to explain patterns of industrial growth that are increasingly disturbing. Among capital goods, overinvoicing tends to raise the relative price and discourage the use of domestically produced capital; of capital that increases the utilization of existing plant and equipment; and of capital that creates employment.

To the extent that the profit incentives of overinvoicing influence investment decisions, they will create or compound a set of familiar and disturbing problems in economic development:

1) by discouraging the growth of a domestic capital-goods industry since it must compete with an effectively subsidized import. In Pakistan, domestic producers must compete with foreign capital goods at 4.56 rupees to the dollar but with foreign consumption goods at rates as high as 22.00 rupees to the dollar [14]. This clearly compounds the bias of cascaded protection under import-substitution policies [3;12];

2) by creating industry that is unnecessarily foreign-capital intensive in its techniques and sectors of production and by perpetuating that pattern so that growth remains heavily dependent on foreign capital;

3) by discouraging the *use* of existing plant and equipment in favour of adding new capital with consequent reduction in both the level and growth of consumption and employment [15]; and

4) by discouraging industrial employment both through reduced capital utilization and through selection of complex, labour-saving and capital-using techniques and products.

B) The distribution of income is affected by overinvoicing on both ends of the income scale. Investment in employment-denying techniques and sectors reduces potential earnings of the unemployed and underemployed at the same time that profits accruing to the already privileged industrialists are increased.

C) The external effects of overinvoicing on the growth of the economy may be among its most costly consequences. The very real pressures and temptations faced by individuals in sanctioning agencies who have something very valuable to give away tends to redistribute overinvoicing profits from industrialists to agency employees, spreading corruption and raising "the cost of doing business". And whatever economic criteria these agencies may have applied to investment decisions[20] will tend to get lost under mutual political and

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[20]Quite apart from individuals' temptations to ignore overinvoicing, note that the ? cies mainly responsible for the surveillance of overinvoicing are semi-private investment loa.. organizations and as such they have an inherent conflict between their interest in honesty-and-economic-development on the one hand and their interest as a bank in the volume of loans and the financial solidity of their borrowers on the other. Overinvoicing gives foreign-exchange

financial payoffs that have nothing to do with economic development objectives. And a sort of Gresham's Law of Honesty, bad intentions drive out good as a rising cost of doing business forces corruption on even the reluctant businessman. This is a major source of concern about the increase in overinvoicing in Pakistan over the past four years — that it is increasingly difficult for businessmen to choose not to overinvoice.

Finally, corruption increases the demands on industrialists' energies at the same time that it restricts the number of persons who can be trusted to share management's (often illegal) decisions. Industrial corruption not only diverts limited entrepreneurial talents from production, innovation, market and employment concerns and toward illicit financial intricacies, but its illegality also restricts — often to family members — the number who can be trusted to know of a firm's methods of operation.

Four alternatives appear open to a government faced with large-scale overinvoicing of capital imports and its destructive effects on development:

1) inaction, with continued opportunities for overinvoicing profits;

2) increased surveillance to try to reduce overinvoicing. But regardless of the sincerety of efforts, it is virtually impossible to control overinvoicing considering the myriad ways it can, in fact, be done (misstatement of invoice value, shortages in actual shipments, substitution of old machinery for new, substitution of cheap models for expensive, omission of invoiced spare parts, *etc., etc.,*). What is more, to the extent that control is effective, it is possible that increased enforcement would increase overinvoicing profits by reducing the supply of dollars and raising the black-market rate of exchange. This is the problem of "optimal enforcement";

3) detailed specification of allowable industrial capital imports so that only specified plant configurations with detailed equipment lists are importable. This would not only run into the same problems as any other increase in surveillance, but to the extent that it worked, it would introduce further rigidities and compound the problems of inappropriate technology created by overinvoicing;

4) devaluation to remove the primary incentive to overinvoicing. As I have shown, an adequate effective devaluation would both remove the incentive

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market profits to their borrowers, increasing their financial resources (if profits are kept within the company) and the loans made by the agency thereby become more secure. Even without this added protection to already well-secured loans, a policy of tolerance increases loans outstanding and, therefore, profits to the lending agency. Ethics and economic development aside, there is a clear motive for these agencies to wink at overinvoicing of capital-goods imports. Even if they do not succumb to this temptation, it can certainly be doubted that they should have the major role in policing overinvoicing.

to overinvoicing and remove the biases among various types of capital goods. It is important that effective devaluation can be accomplished by *a*) a change in the official exchange rate, *b*) and increase in the general tariff on all capital imports or *c*) an extension of the bonus system through an increase in coverage and premium.

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