

Tariff Protection, Import Substitution, and Investment Efficiency : Reply

by

RONALD SOLIGO

and

JOSEPH J. STERN

The essence of Papanek's comments are that the methodology of our study has biased our results and hence that our conclusions must be qualified. As pointed out by Papanek the issues raised in our paper are of crucial importance to policy and planning decisions in Pakistan and for this reason much more work needs to be done before one can determine what a rational policy for industrial development would be. However, we do not believe that the issues raised by Papanek would significantly affect our results. We do not mean to imply that our results are not open to substantial qualifications but we do feel that the methodological questions raised by Papanek are not the relevant ones.

In what follows we discuss each of the three "adjustments" which Papanek proposes and state why they do not, or may not, alter our results in any significant way. Finally, we suggest what we believe to be the more important issues which may affect our conclusions about what the direction of industrialization should be.

Papanek's first "adjustment" relates to the use of output at market prices rather than at factor cost. This issue arises only because we do not have world prices and must make some assumption about the relationship between domestic prices and world prices. In this sense, Papanek's first point is part of his third "adjustment" regarding our price assumption.

The question of tax incidence is a very complicated one and this is not the place to review that literature. We can say, however, that the argument developed by Radhu [4] and cited by Papanek is essentially a short-run point of view where inputs are fixed in their present use, the domestic demand curve is given and the possibility for firms to divert their output from the domestic to the foreign market to any significant extent is limited. Over time resources will move so as to equate their returns at the margin. When demand for a product is growing over time, the adjustment of an industry to a tax rise is made much more quickly since it is not necessary to physically withdraw resources from that industry. The

data we have used may be taken to reflect a state where industries have partially adjusted to indirect taxes. The extent to which a particular industry has adjusted to each tax change is, among other things, a function of the time lag between the observation and the date of the tax change. To assume that taxes are shifted wholly onto suppliers of factors is at best a rough approximation of reality. There is, in our opinion, no clearcut case favouring this assumption over the alternative one of assuming that taxes are shifted forward to the consumer.

Since we have two alternative assumptions it is useful to consider how a shift from one to the other would affect our results. In discussing the affects of this change on our results Papanek states that "it is clear that.....the value added in consumer goods industries would have increased much more than value added in the other two categories", that is, intermediate goods and investment and related goods. This statement is not necessarily correct. It is true that using output at market prices rather than at factor cost will increase our estimate of value added at world prices for those industries in which taxes are levied. Surprisingly, it is not necessarily true that those industries with the highest indirect tax rates will experience the greatest change in the estimated value added at world prices when we use output at market prices rather than at factor cost! This can be seen as follows. The equation we used to calculate value added at world prices had the general form:

$$V_i^f = \frac{Z_i - D_i}{(1+t_i)} - \sum_{j=1}^n \frac{X_{ji}}{(1+t_j)} \dots\dots\dots(1)$$

where:

- Z_i = gross value of output of industry i at market prices;
- D_i = total indirect taxes on the output of industry i;
- t_i = tariff rate on commodity i;
- t_j = tariff rate on commodity j;
- X_{ji} = total deliveries from industry j to industry i measured in domestic prices;

and V_i^f = value added of industry i at "world prices" based on output at factor cost.

Value added at "world prices" derived from output at market prices would have the form:

$$V_i^m = \frac{Z_i}{(1+t_i)} - \sum_{j=1}^n \frac{X_{ji}}{(1+t_j)} \dots\dots\dots(2)$$

where:

V_i^m = value added of industry i at "world prices" derived from output at market prices.

Subtracting (1) from (2) we have:

$$V_i^m - V_i^f = \frac{D_i}{(1+t_i)} \dots \dots \dots (3)$$

If d_i is the rate of domestic tax on output at factor cost of the i -th industry and X_i is the output at factor cost, then (3) can be re-written as:

$$V_i^m - V_i^f = \frac{d_i X_i}{(1+t_i)} \dots \dots \dots (4)$$

Thus, put another way, the absolute difference in the two measures of value added at world prices is equal to the output at factor cost multiplied by the

ratio $\frac{d_i}{(1+t_i)}$.

Now it is Papanek's contention that this ratio for consumer goods is greater than for capital goods¹. Our results, therefore, would follow from the fact that we have implicitly deflated the output of the consumer goods industries by a ratio which must be, *a priori*, larger than the same ratio for the capital goods industries. However, given some additional information about the relative values of t_i and d_i for consumer goods and capital goods we can make some statements about the

ratio, $\frac{d_i}{(1+t_i)}$, and the difference $V_i^m - V_i^f$.

i) in all industries in which domestic taxes are levied ($d_i > 0$), the difference in the value added concepts will be positive ($V_i^m - V_i^f > 0$);

ii) in Pakistan, the rate of tax on domestically produced goods is always less than 100 per cent ($d_i < 1.0$) while the tariff rates are either zero or positive

($t_i \geq 0$); hence, the ratio $\frac{d_i}{(1+t_i)}$ is always less than unity;

iii) while the tax rates on domestically produced goods are higher on consumer goods than on capital goods, import tax rates are also higher

¹ To simplify the analysis we use "capital goods" to mean both intermediate goods and investment and related goods.

on consumer goods than on capital goods. In fact, the difference in domestic tax rates between consumer and capital goods is very much smaller than the difference in import tax rates. It is in fact this relative difference which is important in analysing the effect of using factor cost instead of market prices. This can be shown as follows.

Let:

t_i^c = tariff rate on consumer goods;

t_i^k = tariff rate on capital goods;

d_i^c = domestic tax rate on consumer goods;

and d_i^k = domestic tax rate on capital goods.

We can then express statement *iii*) above as follows:

$$d_i^c > d_i^k \dots\dots\dots (5)$$

$$t_i^c > t_i^k \dots\dots\dots (6)$$

$$\text{and } d_i^c - d_i^k < t_i^c - t_i^k \dots\dots\dots (7)$$

We wish to find the conditions under which the ratio for consumer goods is less

than the ratio for capital goods; that is $\frac{d_i^c}{(1+t_i^c)} < \frac{d_i^k}{(1+t_i^k)}$. Changing

our inequalities to equalities, we can write:

$$d_i^c = d_i^k \cdot q \text{ where } q > 1 \dots\dots\dots (5a)$$

$$\text{and } t_i^c = t_i^k \cdot p \text{ where } p > 1 \dots\dots\dots (6a)$$

$p > q$

Therefore, the ratio for consumer goods can be written as:

$$\frac{d_i^c}{(1+t_i^c)} = \frac{d_i^k \cdot q}{(1+t_i^k \cdot p)} \dots\dots\dots (8)$$

To find the conditions under which the two ratios are equal we write:

$$\frac{d_i^k \cdot q}{(1+t_i^k \cdot p)} = \frac{d_i^k}{(1+t_i^k)} \dots\dots\dots (9)$$

and solving for t_i^k , we find that:

$$t_i^k = \frac{q-1}{p-q} \dots\dots\dots (10)$$

which is always positive. Using the relationship for equality between the ratios for capital goods and consumer goods, it can be seen that if $t_i^k > \frac{q-1}{p-q}$, then

the ratio for capital goods, $\frac{d_i^k}{(1+t_i^k)}$, will be greater than $\frac{d_i^c}{(1+t_i^c)}$, the ratio for consumer goods. Hence the ratio $\frac{d_i}{(1+t_i)}$ may be smaller for consumer goods than for capital goods.

From the above analysis one can see that no simple generalizations can be made about the relative changes in value added at world prices which would result when output at market prices are used rather than output at factor cost. One must look at the tax rate on domestic output, the tariff rate on competing imports and the relative difference between these rates for capital and consumer goods.

Thus, *a priori*, one cannot make any strong statements about the differences in value added as derived using two different measures of gross output. Table I shows the value of U_i , the ratio of net subsidy from tariffs to value added, computed on the basis of output at factor cost and U_i' , computed on the basis of market prices². Although there are a number of changes, the distinction between consumer and capital goods industries with respect to the value of U_i' remains, in general, unaffected by the measure of output used.

It is interesting to note, however, that for the two industries in the study that receive a subsidy (grain milling and fertilizers) the value of U_i' is greater than one. This implies that the value added at 'world prices', based on output at market prices, is negative for these two industries³. We, for one, would be very reluctant to admit that such could be the case. It is thus apparent that subsidies *are* passed on to the consumers and that, therefore, at least in the case of subsidies, our original method, based on output at factor cost, gives a more reasonable result.

Papanek's second point concerns the understatement of profits by industrialists. The data to which he refers was obtained by a sample survey of industrialists. As this survey data has not yet been published in full we did not use it nor

² See [5] for definition of U_i .
³ See [5] for fuller discussion of the meaning of $U_i > 1$.

TABLE I
 IMPLICIT RATE OF PROTECTION OF VALUE ADDED

Industry	U_i	U_i'
<i>Consumer Goods</i>		
i) Food, beverages and tobacco		
Canning and preserving	3.11	3.11
Grain milling	-0.27	1.19
Rice milling	-0.10	-0.10
Bakery products	1.21	1.20
Sugar	1.15	0.87
Edible oils and fats	2.02	1.55
Tea	0.45	-0.35
Salt	0.78	-0.15
Beverages (non-alcoholic)	1.08	-0.06
Cigarettes	1.30	1.18
ii) Textiles, wearing apparel and footwear		
Cotton textiles	1.52	1.35
Woollen textiles	1.46	1.42
Silk and art silk	1.41	1.39
Knitting	1.30	1.30
Footwear	1.04	0.94
Wearing apparel	2.17	2.16
iii) Other consumable goods		
Wood products (furniture)	1.84	3.18
Printing and publishing	-0.15	-0.15
Leather goods	1.12	0.85
Soaps, perfumes and cosmetics	0.14	0.11
Matches	0.92	0.59
Optical goods	0.31	0.24
Plastic goods	0.77	0.75
Sports goods	0.48	0.48
Pencils and pens	0.39	0.33
<i>Intermediate Goods</i>		
Jute textiles	1.52	1.45
Dyeing and finishing of textiles	1.38	1.38
Thread and thread ball	1.45	1.45
Saw milling	1.52	1.52
Tanning	2.11	2.11
Rubber products	0.81	0.59
Fertilizers	0.18	1.23
Paints and varnishes	0.46	0.12
Pharmaceuticals and chemicals, nec.	0.33	0.51
Petroleum and coal products	1.01	0.92
Paper products	0.59	0.78
<i>Investment and Related Goods</i>		
Metal furniture	2.53	2.53
Non-metallic products	0.46	0.29
Cement	0.58	0.29
Basic metals	0.58	0.56
Metal products	0.98	0.93
Non-electrical machinery	0.11	0.11
Sewing machinery	0.78	0.78
Electrical appliances	0.67	0.59
Electrical machinery	0.25	0.11
Other transport equipment	0.33	0.34
Motor vehicles	3.96	3.94
Cycles	1.61	1.61

can we judge the relevance of its results to our study. The important point, as we see it, is the extent to which the kinds of biases which Papanek's interviews reveal, have influenced the calculations of value added in the data we have used.

The data we have used has been derived within the framework of an input-output table. Without going into the details on the methodology employed in estimating the inter-industry flows, we would like to draw attention to the following pertinent facts. Value added has been derived essentially as a residual. The estimates of gross output were available from a variety of independent sources, e.g., the Central Statistical Office, the Census of Manufacturing Industries and the Central Board of Revenue. The data on intermediate deliveries were taken from the Census of Manufacturing Industries for Pakistan. This data was then put into an inter-industry framework and adjustments were made to reconcile conflicting information in such a way as to ensure overall balance between deliveries and uses of each commodity. Value added is then the difference between gross output and intermediate deliveries plus indirect taxes.

The effect of understating of profits by industrialists can affect the estimates of value added as derived by Tims-Stern [2] only to the extent that industrialists understate profits by understating gross value of output and/or by overstating intermediate inputs. Since most domestically produced output is subject to domestic indirect taxes which are levied at the point of production any understatement of gross value of output in the Census of Manufacturing Industries can be adjusted by using independent data from the tax collecting agency, the Central Board of Revenue. Similarly, since there are many government controls on the input side, such as import licences and provision of inputs (particularly services) by government enterprises, any overstatement of inputs can also be checked. Further, the input-output framework does adjust the data to ensure equality between gross output by the producers and total consumption by users. This basic equality is an additional constraint on any under or overestimation of outputs or inputs by any one industry.

It is more usual for industrialists to understate profits by overstating labour costs and/or depreciation. Estimates of gross value added as derived by Tims-Stern [2] are not affected by these methods.

A more relevant criticism of our methodology would be that we have used a measure of gross value added where in fact, we should have used net value added since we are making a statement regarding factor returns. By using gross value added we have *overstated* the amount which is paid to factors of production. Our results would be biased against consumer goods industries if the rates of net to gross value added in these industries were greater than for other industries. In other words, there would be a bias if *real* depreciation were a smaller

proportion of gross value added in consumer goods industries relative to other industries. The relative importance of depreciation is a function of the age structure of the capital stock as well as the capital intensity of production. It is obviously very difficult to make any *a priori* generalizations about the existence or direction of any bias (in relative terms) arising from our assumption that the ratio of net to gross value added is equal in all industries. In the absence of additional information it seems that this was the most appropriate assumption to use.

Papanek's third point is directed towards our assumption regarding the relationship between domestic and world prices. In terms of introducing biases into our conclusions, this assumption is important only if it can be shown that the assumption is less true, in some sense, for consumer goods industries as compared with other industries. Papanek argues that our price assumption is less likely to hold for consumer goods because:

- i) "a number of consumer goods are exported", and
- ii) "some consumer goods industries are highly competitive".

In the case of consumer goods which are also exported, Papanek states that domestic prices are equal to "...world market prices plus the subsidy implied in the export bonus voucher scheme minus the cost of exporting....." This statement is based on the proposition that firms would sell on the domestic and foreign markets so as to equate their marginal revenue in each market. If we assume pure competition in both markets, however, so that the marginal revenue is equal to the price in both markets, it is clear that the domestic price must equal the world price plus the export subsidy *plus taxes levied on domestic sales*⁴. Otherwise, the marginal revenue to the domestic producer would not be equal in both markets.

Furthermore, it is extremely unlikely that both domestic and foreign demand elasticities facing Pakistani suppliers are infinite. It is generally assumed that domestic demand is more inelastic than the foreign demand; hence domestic prices would be *greater* than world prices plus the export bonus subsidy plus indirect taxes on domestic sales.

With respect to the degree of competition in domestic consumer goods industries, the "vigorous competition" which is most apparent to us is "non-price" or promotional competition. Indeed, the presence of a large volume of advertising suggests that domestic manufacturers face downward sloping demand curves in the domestic market. In the oligopolistic market structure which characterizes

⁴ Exports of manufactured goods are generally exempted from domestic sales and excise taxes.

the large scale manufacturing sector in Pakistan, collusion, tacit or otherwise, may be expected, particularly in the absence of effective "antitrust" legislation. The presence of large promotional expenditures or of excess capacity do not, in themselves, provide a basis for rejecting our price assumption.

In Table II of his comments, Papanek presents data on the export bonus and import duty for three commodities. Using his own assumption regarding the relationship between domestic and world prices, Papanek concludes that the data in Table II "suggest that at least for some important goods the internal price is less than c.i.f. plus tariffs". We have already pointed out above that Papanek has neglected to account for domestic indirect taxes which are only levied on domestic sales. His conclusion is also biased by his choice of the "average" import duty. In our calculations we made some attempt to use tariff rates on competing imports. Papanek has chosen a simple arithmetic average of tariff rates for a whole class of commodities, many of which are not the same product as produced in Pakistan. For example, Papanek has shown the rate of import duty on cotton cloth as 153 per cent. In fact, this rate of duty includes tariff rates on many textile products which are not produced in Pakistan or only in very small quantities, and which have exceptionally high tariff rates. In our analysis we used an average of import duties on actual competing imports. Thus for cotton textiles the tariff rate used was 125 per cent rather than 153 per cent.

According to Radhu [3] the domestic tax rate on cotton cloth was 25 per cent in 1962/63. Adding this to the export *plus* export subsidy price, we find that the domestic price would be about 80 per cent above world prices.

All of this is based, however, on the assumption that both markets are purely competitive. This assumption is not, in general, likely to be true.

The methodology which we have used in our study does indeed draw upon some strong assumptions. These assumptions were necessary in view of the information which was available. It naturally follows that our conclusions are correct only to the extent that these assumptions hold. Papanek has offered hypotheses regarding three possible ways in which biases have been introduced into our study. We have argued that the adjustments put forth by Papanek are not likely to alter our results although we have not been able to test all of these formally, again because we lack the necessary data.

There are two aspects of our paper on which Papanek does not comment but which we feel should be emphasized. First, one could argue that the present profitability of Pakistani manufacturing is not an appropriate measure of long run comparative advantage. In a country where the industrial sector is scarcely fifteen years old, all industries can claim to be "infant industries", in the sense

that all are still in the learning process. A counter argument, however, is that those industries which require a long learning period should, *ceteris paribus*, be postponed in preference to those industries which will place less of a strain on the scarce entrepreneurial and technical skills. Secondly, our conclusions are based on the industrial composition reflected in our data. The conclusions reflect, therefore, the past allocation of resources and are a guide to future policy only insofar as the profitability of future investment is reflected by that of the past. We should stress again that our conclusions cannot be taken to apply to new manufacturing processes which have not been undertaken in the past.

Finally, we wish to point out that our conclusions refer to broad industry aggregates, consumer goods, intermediate goods and capital and related goods industries. Within each of these groups, however, there are some exceptions to the general conclusion and it would be wrong to interpret our results as being completely critical of every consumer goods industry. Our comments with respect to the consumer goods industries are influenced to a large extent by the results we obtained for the textile group which is the largest component of the consumer goods aggregate. Our results, that the textile industry is "inefficient", support those obtained by Mallon [1] although arrived at independently. At the same time there are other consumer goods industries which, by our criteria, would be "efficient". Similarly, certain capital goods industries, such as motor vehicles, would be "inefficient".

REFERENCES

1. Mallon, Richard, "Export Policy in Pakistan" in this issue of this *Review*.
2. Pakistan, Planning Commission, International Economics Section, *Methodology of Estimating Import Requirements*. Mimeographed. (Karachi: Planning Commission, March 1965).
3. Radhu, Ghulam Mohammad, "The Rate Structure of Indirect Taxes in Pakistan", *Pakistan Development Review*, Autumn 1964, pp. 527-551.
4. —————, "The Relation of Indirect Tax Changes to Price Changes in Pakistan", *Pakistan Development Review*, Spring 1965, pp. 53-63.
5. Soligo, Ronald and Joseph J. Stern, "Tariff Protection, Import Substitution and Investment Efficiency", *Pakistan Development Review*, Summer 1965, pp. 250-270.