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STRUCTURAL BASIS OF PAKISTAN'S FOREIGN TRADE

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INTRODUCTION

The importance of trade to development and growth is since long, a much discussed problem. On the one hand, economists like Nurkse, Haberler and Cairncross (27, 10, 5) through their empirical studies proclaim trade as an "engine" and "handmaiden" of growth. On the other hand, Prebisch, Singer, Meier and Myint (34, 38, 22, 23, 24) severely differentiate between developed and underdeveloped economies in regard to their gains from trade. However, regardless of the nature and extent of gains from trade, it is an admitted fact that each of the trading partners does benefit from trade. Trade plays a vital role in the development of labour surplus economies. It accelerates development by a process of reallocation of labour from an overpopulated subsistence agriculture to a growing industrial sector. Specialization helps a better resource allocation and prompts growth. Trade and its changing levels introduce changes in income distribution within the concerned economies.

In view of the importance of foreign trade, as surveyed by Bhagwati, Chipman (3, 6), various theories such as Ricardo's comparative cost (advantage) and Heckscher-Ohlin's factor endowment theory have been designed to explain the causational flow of foreign trade. The underlying proposition of these theories is that a country tends to

export commodities which use its abundant factor of production intensively and imports the commodities which use its scarce factor intensively. Several empirical tests have been conducted concerning the validity of this hypothesis. Leontief's pioneer work (19) was followed by Macdougal, Balassa, Wahl, Tatemote and Ichimura, and Bharadwaj (20, 2, 40, 39 and 4). The results of most of these studies support the hypothesis in one way or the other. Different aspects of Pakistan's foreign trade have been studied (37, pp. 15-16) extensively. But no particular attempt seems to have been directed in relation to the factors namely capital and labour requirements determining the basis of Pakistan's foreign trade. This study addresses itself to this particular problem. It attempts another empirical verification of the above mentioned hypothesis and assesses whether exports of Pakistan - a labour abundant economy are labour intensive. Which in terms of factor requirements requires Pakistan's capital-labour ratio of exports to be smaller than that of her imports.

The study consists of four major sections. The first section elaborates the methodology used in the paper. The second section explains data requirements and the third section presents results. The fourth section sums up conclusions and is followed by an appendix embodying most of the data used in the paper.

1. Methodological Framework.

The following methodological framework has been employed for the evaluation of factor requirements. The methodology does not differ in any special sense from that of Leontief (19, pp.126-128) and is hereby illustrated for the convenience of the readers. It starts from the basic balance equation of an economy as,

$$X = AX + E - M + F \text{ --------- } (1)$$

where $X = \left\{ X_1, X_2 \text{------} X_n \right\}$ is a column of outputs of n sectors of the economy, n - 1,2 ---33; i-e, X is gross domestic product.

$$A = \begin{bmatrix} a_{11} & a_{12} \text{-----} & a_{1n} \\ a_{21} & a_{22} \text{-----} & a_{2n} \\ \vdots & \vdots & \vdots \\ a_{n1} & a_{n2} & a_{nn} \end{bmatrix}$$

is a square matrix of input coefficients. For all subscripts i and J (i,J = 1,2 ----- n), a_{iJ} is the amount of sector i 's pro product used by sector J per unit of output of sector J. AX becomes the intermediate demand for total output.

$F = \left\{ F_1, \quad F_2 \text{ ----- } F_n \right\}$ is a column of residual constants, each F_i represents that part of sector i' s output which is allocated directly to all final uses such as consumption and investment, other than exports.

E and M are, respectively, the values of total exports from and imports into n sectors in millions of rupees. The total exports and imports can be expressed into their proportional distribution over n sectors of the economy as under;

$$E = \begin{bmatrix} e_1 \\ e_2 \\ e_i \\ en \end{bmatrix} \bar{E} \quad \text{and} \quad M = \begin{bmatrix} m_1 \\ m_2 \\ m_i \\ m_n \end{bmatrix} \bar{M} \text{ ------- } (2)$$

where, each $e_i = \frac{Ei}{\bar{E}}$ and $m_i = \frac{M_i}{\bar{M}}$ shows, respectively, the amount of sector i ' s exports and imports per unit of total exports from and imports into n sectors. Substitution of (2) into (1) and the transposition of A X to left hand side yields;

$$\begin{bmatrix} X - AX \end{bmatrix} = \begin{bmatrix} (e_i) \cdot \bar{E} - (m_i) \cdot \bar{M} + F_i \end{bmatrix} \quad \text{---- (3)}$$

$$\begin{bmatrix} X \end{bmatrix} = \begin{bmatrix} I-A \end{bmatrix}^{-1} \cdot \begin{bmatrix} (e_i) \cdot \bar{E} - (m_i) \cdot \bar{M} + F_i \end{bmatrix}$$

$$\begin{bmatrix} X_e \end{bmatrix} = \begin{bmatrix} I - A \end{bmatrix}^{-1} \cdot \begin{bmatrix} e_i \end{bmatrix} \quad \text{---------- (4)}$$

$$\begin{bmatrix} X_m \end{bmatrix} = \begin{bmatrix} I - A \end{bmatrix}^{-1} \cdot \begin{bmatrix} m_i \end{bmatrix} \quad \text{----------(5)}$$

X_e and X_m in equations (4) and (5) indicate the respective amounts of gross domestic product needed to sustain a unit (one million rupees worth) of exports and imports. The premultiplication of $\begin{bmatrix} k_i \end{bmatrix} = \begin{bmatrix} k_1, k_2 \text{---} k_n \end{bmatrix}$ and $\begin{bmatrix} l_i \end{bmatrix} = \begin{bmatrix} l_1 & l_2 \text{--} l_n \end{bmatrix}$ where each k_i and l_i shows the respective amount of capital and labour needed to produce one unit of output in ith sector to $(I-A)^{-1}$ gives the sectoral direct and indirect capital labour requirements for a unit of output i.e;

$$\begin{bmatrix} K^* \end{bmatrix} = \begin{bmatrix} K_i \end{bmatrix} \begin{bmatrix} I - A \end{bmatrix}^{-1} \quad \text{---------- (6)}$$

$$\begin{bmatrix} I^* \end{bmatrix} = \begin{bmatrix} l_i \end{bmatrix} \begin{bmatrix} I - A \end{bmatrix}^{-1} \quad \text{---------- (7)}$$

The premultiplication of row vectors of capital and labour coefficients to equations (4) and (5) gives the final operationable relations for the evaluation of factor requirements for exports and imports as follows:

$$K_E = \left\langle \underset{1\times 33}{\left[K_i \right]} \right\rangle \underset{33\times 1}{\left[X_e \right]} = \left\langle \underset{1\times 33}{\left[k_i \right]} \right\rangle \underset{33\times 33}{\left[I - A \right]^{-1}} \cdot \underset{33\times 1}{\left[e_i \right]} \text{ ---- (8)}$$

$$L_E = \left\langle \left[l_i \right] \right\rangle \left[X_e \right] = \left\langle \left[l_i \right] \right\rangle \left[I - A \right]^{-1} \cdot \left[e_i \right] \text{ ---- (9)}$$

$$K_M = \left\langle \left[k_i \right] \right\rangle \left[X_m \right] = \left\langle \left[k_i \right] \right\rangle \left[I - A \right]^{-1} \cdot \left[m_i \right] \text{ ---- (10)}$$

$$L_M = \left\langle \left[l_i \right] \right\rangle \left[X_m \right] = \left\langle \left[l_i \right] \right\rangle \left[I - A \right]^{-1} \cdot \left[m_i \right] \text{ ---- (11)}$$

In these relations $\left[K_E , L_E \right]$ and $\left[K_M , L_M \right]$ represent capital and labour requirements for one million rupees worth exports and imports, respectively. The resulted factor requirements help calculating capital, labour ratios for exports and imports whose comparison is to verify the desired hypothesis.

II. Relevant Data's Procurement.

The paper consists of a cross sectional statistical test on Pakistan[1] for 1969-70. Selection of the year was well-planned. The study was one of the series of studies initiated under the guidance of Dr. Stephen E. Guisinger[2] for assisting the project (8). The study had to focus on this year as it was one of the important, conclusive years of that project. Data constraints also relatively favoured this year.

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*Corresponding vectors and matrices bear the same order in the following equations.

[1]Pakistan refers to the region known as West Pakistan before 1971's dismemberment.

[2]Research advisor to the Pakistan Institute of Development Economics, 1974-76.

For instance, most of the data pertaining to manufacturing sector was to be extracted from Census of Manufacturing Industries (C.M.I). Which till date is not published for any year later to 1969-70. The input - output analysis related to about one year before 1971's national disintegration aimed implicitly to help capturing the effects, if any, of that mishap on the factor requirements, trade and production structure of the remainder Pakistan. Which is quite possible through the comparison of the results of this study with those of any corresponding study conducted for any of the succeeding year.

The study necessitated the data on input coefficient matrix, proportional distribution of exports and imports and capital, labour coefficients. The data have been procured from various sources as follows. The input coefficient matrix is obtained by inflating Khan and Mac Ewan's input-output flow table (15, Table 4B. Appendix PP.1-6) by the following method.

$$F^t_{ij} = \frac{F^o_{ij}}{P^o_i} \times P^t_i = F^o_{ij} \cdot \frac{P^t_i}{P^o_i} \quad \text{-------} \quad (12)$$

$$C^t_{ij} = \frac{F^t_{ij}}{X^t_j} \quad \text{----------} \quad (13)$$

$$C^t_{ij} \times X^t_j = F^t_{ij} \quad \text{----------} \quad (14)$$

Where, F_{ij} = the flow of sector i's output being used as input in sector J, i,J = 1,2 ----------33.

O = Base year viz, 1962-63

T = Current year viz 1969-70

P_i = The price index of sector i's output.

C_{ij} = The input coefficient i.e., the amount of sector i's output required to produce one unit of output in sector J.

X_J = Gross value of production in sector J.

The inflating process consists of converting the given base year inter-industrial flows by their respective price indices to current flows, as shown in equation (12). The division of current flows into a sector by the gross value of production of that sector yields the input coefficient for that sector, as is indicated in equation (13). The resulted input coefficient i.e., C^t_{ij} for all the sectors are given in appendix table 3, which form the input coefficient matrix for 1969-70. Gross value of production of each sector is also given in the same table against code number 100. The input - output flow matrix for 1969-70 can be obtained, if desired, from table 3, as is shown in equation (14).

The price indices used for adjusting base year's input-output industrial flows are given in appendix table 2. Most of these were taken from (30, pp. 317-320). Weighted price indices for a few industries were provided by Dr. Stephen E. Guisinger who had got these prepared for studies (9, 7 & 21). Paasche's weighted price indices based on gross national product estimates of current and constant factor costs (30, pp. 296-300) were calculated for the industries coded as 04, 26, 29-33. Industrial classification adopted in this adjusted inptu coefficient matrix is mainly that of Khan and Mac Ewan (15. pp.41-42). However, a few changes have been introduced in that. A few industries of Khan and Mac Ewan's input-output table viz, 03, Jute growing and baling, 05 tea growing and processing, 12 Jute textiles and 33 Ownership of dwellings have not been included in this new table since they had little inter-dependence with the other industries. Three categories of construction 25, 26 and 27 have been aggregated because of their too much similarity and the difficulty involved in obtaining their needed corresponding

disaggregated data on price indices and capital, labour coefficients. Four important industries of the original table have been disaggregated since their relevant, necessary data are easily obtainable. The industries were 14 paper and Printing, 18, Other Chemicals, 22 Machinery and 23 Transport Equipment. Each of these four industries have been decomposed, respectively, into two sub-industries now coded as 11 paper and paper Products, 12 Printing & Publishing, 16 Industrial Chemicals 17, Non-Industrial Chemicals 21, Electrical Machinery 22, Non-electrical Machinery, 23 Motor Vehicles and 24, Other Transport Equipment. The level of output of each disaggregated industry in 1969-70 (29) as a proportion to that of major industry has been used as disaggregating weight. The disaggregation weights, sectoral codes and the final industrial classification are given in appendix table 2.

The inflated input coefficient matrix is based on an implicit assumption that the inter-industrial proportional flows remain constant over this six years period viz, 1962-63 to 1969-70. The assumption is not uncommon or unrealistic in the field of input-output analysis which has been developed ma on fixed coefficient production functions. The input flows almost remain constant over some period. On account of the huge costs involved in the preparation of input-output tables neither developed nor a developing nation can afford to have fresh, up-to-date tables on annual basis, Naturally such data are used with certain manipulations over years. For instance, even Leontief's second attempt of 1951 has been carried out on his of the data of internal structural relationships of 1947 (19,p.120). Bharadwa study (4, p.107-108) is based on Indian and United States trade data of 1951 adjusted, respectively, at the prices of 1953-54 and 1947. In this perspective our adjusted input coefficient matrix seems compatiable with

the normal practice. The coefficient matrix sounds quite reasonable and reliable. The revised matrix captures, at least, the effect of changed prices and costs. It might serve for practical purposes till the availability of some new comprehensive input-output table for Pakistan, as it has been used in (25, 26 and 1).

Exports, import proportions given in appendix table 2 were obtained from the foreign trade data compiled by colleagues at the Institute named Seemin A. Khan and Surraiya Nishat. They classified the data for consecutive years consistent with our industrial classification. The data are used by one of those colleagues in her studies (25, 26). If needed, one can work out the respective exports and imports of each sector in 1969-70 through the multiplication of sectoral export, import proportions to the corresponding total exports and imports, all given in columns 14 and 15 of appendix table 2.

Capital coefficients for most of the manufacturing industries were taken from Kemal's study (14, p. 355). Using output weights the coefficients for industries coded as 05, 06, 09, 10, 15, 16, 17, 23 and 24 were obtained by decomposing Kemal's aggregate capital output ratios. For nonmanufacturing sector Khan and Mac Ewan's estimates (16, p. 460) have been used over here. The coefficients for industries 08, 25 and 28 were obtained through the division of their calculated replacement costs by their levels of output in 1969-70 (29). According to Khan's method (17, p.65-70) the replacement cost was calculated by multiplying Khan's average correction factors (16, p. 483) to the assets book value of these industries given in (29). For construction, the multiplication of Khan's capital-labour

ratio (17, p.83) to the labour output ratio yielded the required capital-output ratio. Labour coefficients for the manufacturing sector have been calculated from the labour, output data of (29). Output weights were used, of course, for decomposing certain aggregate figures of labour and output. Labour coefficients for 28, 29-33, are based on the labour estimates found by operating their given employment proportions (28, p. 10) to the total level of employment in 1969-70 and the output figures of (31, p.2). The labour coefficients of 01, 02, and 03 are based on the labour and output estimates calculated, respectively, by multiplying average manyears[3] needed per acre and the average yield per acre of each crop to the corresponding acreage of that corp (35, pp.45-47). The labour coefficient for 04 is assumed to be the average of those of its preceding three sectors. All of the capital, labour coefficients calculated per million rupees of output have been expressed in columns 6 and 8 of appendix table 2. All of the data explained above enabled attaining the results presented in the next section.

However, before proceeding to the results it seems better to sound as a precaution that despite all the possible efforts of attaining reliable, unbiased results, those yet might not be fully authoritative in all the respects. For instance, all the imports are assumed as competitive ones and domestic capital, labour coefficients have been used for evaluating capital, labour requirements for import replacement. These coefficients might differ from the coefficients of the countries from where we import. The observed trade flows of 1969-70 because of some quantitative trade restrictions might be different than the actual

[3]These estimates were obtained from Pakistan Planning Commission, Islamabad.

would have been. There might have been some change in the assumed constant inter-industrial proportional flows during 1962-63 to 1969-70. Thus, the results might have been slightly biased by these uncontrollable factors commonly present in this type of analysis. Therefore, it appears advisable to treat the results with a little care for further use.

III. Results Presentation.

The total (direct and indirect) capital, labour requirements obtained through equations 6 and 7 are given in columns 10 and 12 of appendix table 2. The factor requirements have been ranked in decending order. The comparison of the respective sectoral ranks to the median rank which is seventeen in each of the series shows the relative capital, labour intensity of each sector. According to the rank allocation of the total capital, labour requirements the top most capital intensive sectors appear to be electricity and gas, wheat growing and processing, cement and concrete, transport, rice growing and ginning, cotton textiles and fertilizer. The most labour intensive sectors are construction, rice growing and processing, government, cotton growing and ginning, wheat growing and processing, all other agriculture, forestry and fishry, transport and sugar refining and gur making. The total capital and labour requirements are found to be significantly correlated with rank correlation coefficient of 0.53 and a t.statistic of 3.47. Spearman's rank correlation coefficient between direct capital and labour, total capital and direct capital, total labour and direct labour requirements are found to be 0.58, 0.72 and 0.62, respectively. The given total capital, labour requirements can serve another practical use. If it is

desired for any later year like Leontief (19, p. 120) to see the effect of just change in the material composition of exports and imports over factor requirements, then through the premultiplication of the given row vectors of total capital, labour requirements to the new column vectors of exports, import proportions, one can obtain the new factor requirements per million rupees worth export and import replacements. The difference between the new and the factor requirements estimated by this study would be attributable to the changes in the composition of exports and imports over the concerned period. Following a similar process the effects of changes in other determinants i.e., capital, labour coefficients or the productive structure (input-output structure) of the economy over factor requirements can be assessed.

The other quantitative results obtained through relations (8)---(11) are presented in the figures in table 1.

Table 1

Domestic Capital and labour Requirements Per Million Rupees of Pakistan Exports and of Import Replacements (of Average 1969 - 70 composition)

	Capital : K (Rupees in 1969-70 prices)	Labour : L (Manyears)	$K = \frac{K}{L}$
Exports: E	1918,515.0	305.51	6279.71
Imports: M	1271,402.0	170.77	7445.20

$$K_1 = \frac{K_E}{K_M} = 1.509 \qquad l_1 = \frac{L_E}{L_M} = 1.789$$

$$K_2 = \frac{K_M}{K_E} = 0.66 \qquad l_2 = \frac{L_M}{L_E} = 0.56$$

The factor requirements per million rupees worth of exports and import replacements have been computed initially against an assumed mechanism that let Pakistan for self reliance (alternatively, for reducing dependence on foreign countries) purposes decides to cut down her imports as well as exports, each by one million rupees. For a constant composition of exports and imports, it is further assumed that both of them are reduced by the same proportion in all the industries. The resulted computations show that Pakistan's capital-labour ratio for exports (K_E = 6279.71) is smaller than that of her imports (K_M= 7445.2). Which implies that Pakistan being a labour abundant economy, exports commodities which, on the average, absorb in their production less capital and more domestic labour than would be required for the production in this country of those goods which it apparently finds relatively cheaper to import. Pakistan economizes on her scarce capital and disposes of her surplus labour. Correspondingly, the results support the fundamental trade hypothesis that a country tends to export the commodity that is relatively (to the other commodity) intensive in the relatively (to the other country) abundant factor. Thus, the results of this study are, at least, in relative terms in consonance with the widely held theoritical expectations.

Although the validity of the hypothesis depends upon relative- not the absolute- capital, labour requirements, yet it does not seem fair to leave the resulted absolute factor requirements unexplained. Absolute labour requirements are in accord with theoretical expectations. Labour required per unit of exports is greater than that of imports.

The labour ratio for exports to imports ($l_1 = \frac{305.51}{170.77} = 1.80$) exceeds unity. Which means that each unit of exports absorbs .80 units of labour more than that of a competitive import. Alternatively, it can be said that exports are eighty percent more labour intensive than competitive imports. The amount of capital required per unit of exports is also greater than that of imports. The capital ratio for exports to imports ($K_1 = \frac{1919}{1271} = 1.51$) exceeds unit. Which contradicts the theoretical phenomenon and needs to be reasoned out. The absolute capital requirements are in confirmity with the results of certain other quotable corresponding studies. For instance, Nishat (25, p.13) finds capital intensities in most of the industries more than socially desirable. Hussain (11) points out a definite increase in capital-labour ratio during 1959-60 to 1967-68. Kazi Shahnaz et al (12, p. 406) remark that despite greater disparities in factor endowments, productive techniques employed in underdeveloped countries are comparable to those of industrialized countries. Khan (18) concludes from an international comparison of factor intensities that Pakistani capital intensities are near the American level in a number of industries while in certain cases they are even higher. Kemal (14, p. 353) asserts the fact that increasingly capital intensive technology is being used in Pakistan. All of these findings mainly relate to the excessive capital (capacity) installation whose major proportion is found unutilized (13, 42, 41). The huge capital accumulation occurred because of underpriced capital importation through overvalued exchange rate, low interest rates and other incentives given against overemphasized import substitution. Private foreign investment and tied foreign aid also added to the capital accumulation.

These factors along with the above stated high capital intensities result in high capital requirements for exports as well as competitive imports in our study. However, despite a noted striking decline in labour intensity (25, p. 10) the evaluated relative capital, labour requirements of this study ($K_E \angle K_M$ i.e, 6280 $\angle$ 7445) yet confirm the hypothesis that Pakistan's exports are labour intensive.

The comparative capital, labour intensities obtained from this study lead to a few valuable policy implications regarding export promotion and import replacement. The relative capital requirements for the production of exports and competitive imports show that 1.51 ($\frac{1918}{1271} = K_1$) units of competitive imports can be substituted in the output for each unit of exports. The comparative labour costs indicate that 1.79 ($= \frac{306}{171} = l_1$) units of competitive imports can be substituted in the output for each unit of exports. The rate of substitution of competitive imports for exports appears greater for labour (1.79) than for capital (1.51). Which implies that in our labour abundant economy instead of overemphasized import substitution programmes the export promotion (substituting the factors of production in the output from competitive imports for exports produced on labour intensive methods) seems more beneficial since it could enhance, at least, the level of exports, export earnings and more importantly, the level of employment in the economy. While export promotion is possible through the diversification of commodities as well as markets and setting up certain incentives for producers and exporters. Such a policy could work favourably so long as the rate of substitution of labour remains greater than that of capital. Alternatively, it would

hold as long as the index of comparative labour, capital intensity in the production of exports and competitive imports i.e.,

$\alpha_1 = \frac{l_1}{K_1} = \frac{L_E}{L_M} \times \frac{K_M}{K_E} = 1.19$, exceeds unity. The converse treatment of factor intensities directed at import substitution shows the capital and labour substitution rates for the substitution of each unit of exports in output for competitive imports as 0.66 ($= \frac{1271}{1918} = K_2$) and 0.56 ($= \frac{171}{306} = l_2$), respectively. Which are lesser not only to their corresponding above discussed capital, labour substitution rates (1.51, 1.7 but are also less than a unit, implying that the amount of capital, labour producing a unit of export when substituted for the production of competiti import, it produces even less than a unit of competitive import. Which also renders export promotion preferable than import replacement. However, for import replacement the greater rate of substitution of capital (0.66) to that of labour (0.56) hits at the relative installed abundance of capital (42, 41, 13, p. 241) to the scarce utilization of labour in the Pakistan economy of 1969-70. The expected increased capital utilization because of its greater rate of import substitution would also raise, labour absorption since the total capital, labour requirements are found to be significantly correlated.

The preceding analysis of comparative, capital, labour intensities amounts to a policy recommendation of export promotion holding imports at a constant level. Which would hopefully raise the level of exports along with foreign exchange earnings, would lessen capital intensity per unit of output by raising existing low capacity utilization rates (39, p.241) and would generate greater labour absorption in the economy. The process as a whole would strengthen Pakistan's comparative advantage in labour supply.

IV. Conclusions

The study based on the productive structure, direct factor requirements and the average export, import composition of Pakistan; constitutes a cross-sectional statistical test to ascertain the structural basis of Pakistan's foreign trade. It presents an adjusted, fairly disaggregated input-output coefficient matrix which could serve as basis for certain other studies. It evaluates direct and indirect sectoral capital, labour requirements for a set of thirty three industries and distinguishes the top most capital and labour intensive sectors. Following Leontief's methodological framework it presents the computed capital, labour requirements for a million rupees worth exports and imports and accounts for the resulted relative as well as absolute factor requirements. The paper submitting an empirical verification for Pakistan's labour surplus economy that her exports are labour intensive, supports the fundamental factor endowment trade theorem. Through the interpretation of comparative capital, labour intensities it recommends exports promotion policy with controlled imports, which would hopefully augment the level of labour absorption in the economy. The analysis helps measuring the effects of changes in trade policy on factor requirements and assists developmental planning which is of utmost importance for the over-all accelerated development of an economy like our.

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Table - 2

Sectoral Codes, Price Indices, Ranked Direct and Total (Direct and Indirect) Capital, Labour Requirements and Proportional Distribution of Exports and Imports

S.Codes	Industry	Disaggregation Weights	Weighted Price Indices 1962-63 $P_i^0 = P_i$	$P_i^1 = P_i$ 1969-70	Direct Capital, Labour Requirements Per Million Rupees of Output. Capital Coefficients K_i	Rank	Labour Coefficients li	Rank	Direct and Indirect Capital Labour Requirements Per Million Rupees of Output Capital-Req: k^*	Ranks	Labour Req: l^*	Ranks	Export Proportions e_i	Import Proportion. m_i
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
					(000.0)				(000.0)					
01	Rice growing & Processing.		96.0	119.6	2108	4	335.41	3	2963	5	464.13	2	0.0562	0.
02	Wheat growing & Processing		101.4	129.0	2482	3	245.41	8	3287	2	397.28	5	0.00	0.
03	Cotton growing & ginning		96.6	114.5	2055	5	275.59	7	2808	6	402.68	4	0.1341	0.
04	All other Agriculture, Forestry & Fishry		107.5	138.85	926	11	285.47	5	1533	13	391.79	6	0.2836	0.1
05	Sugar Refining and Gur Making		92.8	113.7	145	31	14.0	30.5	1388	17	312.43	8	0.0063	0.0
06	Edible Oils		95.3	137.4	122	32	14.0	30.5	1236	22	219.33	11	0.0013	0.
07	Cigarettes, Bidi and other Tobacco products		118.5	141.1	210	29	16.0	27.5	1140	24	217.41	12	0.001	0
08	Other Food & Drink		103.43	133.63	440	19	16.0	27.5	1249	21	143.63	20	0.0566	
09	Cotton Textiles		100.41	123.59	598	12	66.0	15	2327	7	291.36	9	0.3066	
10	Other Textiles		100.57	151.27	149	30	51.0	17	1068	25	190.60	15	0.0004	
11	Paper & Paper products	0.58	114.1	135.4	1153	10	36.0	20	1728	10	107.67	26	0.0006	
12	Printing & Publishing	0.42	94.02	143.76	515	15	72.0	11	927	28	123.26	24	0.0013	
13	Leather & Leather Products		89.4	142.5	113	33	17.0	26.	523	31	82.95	30	0.0702	

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
14	Rubber & Rubber Products		95.3	121.9	472	17	34.0	22	1451	16	191.07	14	0.0024	0.0207
15	Fertilizer		98.6	131.0	212	28	24.0	24	1962	8	139.28	21	0.0	0.091
16	Industrial Chemicals (Exe, Fertilizer)	0.27	90.27	111.88	318	24	21.0	25	496	32	43.75	32	0.0071	0.0787
17	Non-industrial Chemicals (Drugs, Pharm & other)	0.73	84.27	90.6	531	14	25.0	23	1024	26	87.83	29	0.0092	0.0233
18	Cement & Concrete		111.6	148.3	1854	6	42.0	19	3126	3	123.53	23	0.0107	0.0001
19	Basic Metals		110.86	226.46	469	18	35.0	21	1873	9	183.52	17	0.0001	0.1177
20	Metal Products		106.9	188.3	414	20	71.0	12	1553	12	193.05	13	0.0043	0.0372
21	Electrical Machinery	0.66	100.1	142.8	597	13	47.0	18	1386	18	134.73	22	0.0028	0.0705
22	Non-Electrical Machinery	0.34	99.2	112.4	409	21	74.0	10	810	29	118.55	25	0.0039	0.2287
23	Motor Vehicles	0.78	105.0	132.03	496	16	70.0	13.5	1301	20	166.54	18	0.0003	0.0506
24	Other (Transport) Equipment	0.22	105.01	132.03	256	25	70.0	13.5	477	33	95.47	28	0.0006	0.059
25	Wood, Crock & Furniture		95.1	180.5	240	25.5	59.0	16	756	30	186.14	16	0.0003	0.0104
26	Constructions		104.6	103.94	320	23	397.0	1	1306	19	474.05	1	0.0	0.0
27	Miscellaneous Manufactures		105.01	132.03	240	26.5	14.0	30.5	1190	23	106.15	27	0.015	0.0089
28	Coal & Petrol Products		100.5	144.2	350	22	3.58	33	972	27	80.05	31	0.024	0.0141
29	Electricity and Gas		105.2	125.0	5165	1	114.0	9	6993	1	158.22	19	0.0	0.0
30	Transport		105.23	142.40	2710	2	327.0	4	3077	4	364.76	7	0.0	0.0
31	Trade		104.23	142.89	1381	7	281.0	6	1483	14	288.56	10	0.0	0.0
32	Government		106.34	135.73	1166	9	395.0	2	1689	11	460.92	3	0.0	0.0
33	Services n.e.s.		104.23	143.07	1377	8	14.0	30.5	1477	15	24.40	33	0.0	0.0
40	Total Current Inputs													
100	Grass Value of Production. (Millions of Rupees)													

Total Exports = 166,837,0000

Total Imports = 31,00005, 000

Appendix

Table-3 Inflated Co-efficient Matrix for Pakistan* at 1969/70 Prices

J/I	01 Rice	02 Wheat	03 Cotton	04 All other Agriculture	05 Sugar and Gur	06 Edible Oils
01	0.0316	02 0.0560	03 0.0923	01 0.0065	04 0.6615	03 0.1086
04	0.1224	04 0.2804	04 0.1662	02 0.0414	09 0.0002	04 0.2454
15	0.0263	15 0.0290	09 0.0004	03 0.0097	16 0.0047	06 0.1308
16	0.0009	21 0.0054	11 0.00006	04 0.1063	17 0.0131	08 0.0002
17	0.0023	22 0.0027	12 0.00004	06 0.000014	21 0.0001	09 0.0003
21	0.0066	28 0.0017	15 0.0161	08 0.0018	22 0.0001	16 0.0016
22	0.0033	29 0.0055	21 0.0089	10 0.0006	28 0.0023	17 0.0043
28	0.0125	30 0.0102	22 0.0045	15 0.006	29 0.0004	20 0.0023
29	0.0035	31 0.0342	28 0.0083	16 0.0004	30 0.0093	21 0.0009
30	0.1337	32 0.0001	29 0.006	17 0.0012	31 0.1181	22 0.0004
31	0.0356	33 0.0015	30 0.028	20 0.0019	32 0.000079	28 0.0073
32	0.0005		31 0.0291	21 0.0016	33 0.0026	29 0.0076
33	0.0038		32 0.0007	22 0.0008		30 0.0083
			33 0.0066	28 0.0003		31 0.0941
				29 0.0025		32 0.0012
				30 0.0173		33 0.0062
				31 0.1127		
				32 0.000048		
				33 0.0008		
40	0.3891	40 0.4294	40 0.3694	40 0.3136	40 0.8153	40 0.6309
100	1041.24	100 2804.73	100 1239.59	100 10695.22	100 1636.87	100 846.57

*Pakistan refers to the region known as West Pakistan before dismemberment.

Table 3- Inflated Co-efficient Matrix for Pakistan at 1969/70 Prices

J/I	07 Cigarettes		08 Other Food, Drink		09 Cotton Textiles		10 Other Textiles		II Paper & Paper Products
04	0.2974	04	0.0245	03	0.1964	04	0.0102	04	0.0115
11	0.022	05	0.0603	04	0.0017	09	0.0747	11	0.0723
12	0.0157	06	0.0269	09	0.31	10	0.3416	12	0.0517
16	0.002	11	0.0169	10	0.0204	11	0.0016	16	0.0114
17	0.0057	12	0.0121	11	0.0008	12	0.0012	17	0.0314
21	0.0022	16	0.0108	12	0.0005	16	0.0036	21	0.0086
22	0.0011	17	0.0297	16	0.0191	17	0.0098	22	0.0044
28	0.0007	21	0.0082	17	0.0527	21	0.0031	28	0.0078
29	0.0018	22	0.0041	21	0.0046	22	0.0016	29	0.0083
30	0.0196	25	0.002	22	0.0024	28	0.0072	30	0.0106
31	0.1121	27	0.0157	28	0.0101	29	0.0119	31	0.1345
32	0.0006	28	0.0067	29	0.0168	30	0.013	32	0.0016
33	0.0113	29	0.0074	30	0.007	31	0.1343	33	0.0149
		30	0.0462	31	0.1326	32	0.0014		
		31	0.2182	32	0.0009	33	0.0077		
		32	0.0033	33	0.0074				
		33	0.0092						
40	0.5927	40	0.5082	40	0.7839	40	0.6292	40	0.3754
100	657.74	100	192.92	100	2700.08	100	461.46	100	106.52

Appendix

Table 3- Inflated Co-efficient Matrix for Pakistan at 1969/70 Prices

J/i	12 Printing & Publishing	13 Leather & Leather Products	14 Rubber & Rubber Products	15 Fertilizer	16 Industri Chemical
04	0.0125	04	0.0589	04	0.1516	21	0.0056	03	0.0094
11	0.0519	09	0.0026	09	0.0157	22	0.0020	04	0.0030
12	0.0369	11	0.0019	11	0.0023	28	0.0837	05	0.0005
16	0.0031	12	0.0014	12	0.0016	29	0.1485	06	0.0011
17	0.0225	13	0.2609	14	0.0446	30	0.1551	11	0.001
21	0.0062	14	0.0029	16	0.0222	31	0.0949	12	0.0008
22	0.0031	16	0.0076	17	0.0613	33	0.0012	16	0.0143
28	0.0056	17	0.0210	21	0.0145			17	0.0394
29	0.006	20	0.0104	22	0.0073			21	0.0011
30	0.0076	21	0.0044	28	0.0138			22	0.0006
31	0.0961	22	0.0023	29	0.0154			27	0.0036
32	0.0012	27	0.0013	30	0.0257			28	0.0022
33	0.0107	28	0.0024	31	0.2068			29	0.0023
		29	0.005	32	0.0042			30	0.0047
		30	0.0082	33	0.0177			31	0.0327
		31	0.0354					32	0.0008
		32	0.0003					33	0.0034
		33	0.0012						
40	0.2685	40	0.4281	40	0.6086	40	0.5479	40	0.1219
100	76.12	100	472.27	100	31.14	100	119.97	100	129.75

Table 3 - Inflated Co-efficient Matrix for Pakistan at 1969/70 Prices.

J/I	17 Non-industrial Chemicals		18 Cement & Concrete		19 Basic Metals		20 Metal Products		21 Electrical Machinery
03	0.0258	11	0.0052	16	0.0009	04	0.0004	04	0.0042
04	0.0109	12	0.0038	17	0.0026	11	0.0022	09	0.0009
05	0.0015	16	0.0008	19	0.5193	12	0.0015	16	0.0023
06	0.0030	17	0.0022	21	0.0037	16	0.0023	17	0.0063
11	0.0028	18	0.2466	22	0.0019	17	0.0062	20	0.2204
12	0.002	21	0.0093	23	0.0095	19	0.2826	21	0.0873
16	0.0394	22	0.0047	24	0.0026	20	0.108	22	0.0444
17	0.1086	25	0.0034	28	0.0116	21	0.0037	27	0.0007
21	0.0032	27	0.0032	29	0.011	22	0.0019	28	0.0190
22	0.0016	28	0.0463	30	0.055	28	0.0274	29	0.0093
27	0.0101	29	0.0089	31	0.0932	29	0.0107	30	0.0496
28	0.006	30	0.1045	32	0.0013	30	0.0359	31	0.0109
29	0.0065	31	0.0111	33	0.007	31	0.0991	32	0.0022
30	0.0130	32	0.0007			32	0.001	33	0.0115
31	0.0901	33	0.0111			33	0.0036		
32	0.0023								
33	0.0093								
40	0.3363	40	0.4897	40	0.7196	40	0.5945	40	0.469
100	358.04	100	777.08	100	604.64	100	611.56	100	258.34

Table 3- Inflated Co-efficient Matrix for Pakistan at 1969/70 Prices. Appendix

J/I	22 Non-electrical machinery	23 Motor Vehicles	24 Other(Trans.Equip.)	25 Wood,Work & Furniture	26 Construction	27 Misc.Manufactu
04	0.6021	04	0.0015	04	0.0004	04	0.3138	01	0.00143	03	0.0014
05	0.0004	14	0.1505	14	0.0413	11	0.0004	02	0.0091	04	0.0125
16	0.0012	16	0.0003	16	0.0001	12	0.0003	04	0.0137	08	0.0008
17	0.0032	17	0.001	17	0.0002	16	0.0007	16	0.0034	09	0.0015
20	0.1120	19	0.0537	19	0.0148	17	0.0021	17	0.0093	11	0.0423
21	0.0444	20	0.0355	20	0.0097	20	0.0088	18	0.1266	12	0.0302
22	0.0225	21	0.0131	21	0.0036	29	0.0013	19	0.1939	13	0.001
27	0.0003	22	0.0066	22	0.0018	30	0.0044	20	0.0637	16	0.0542
29	0.0047	24	0.0510	24	0.014	33	0.003	22	0.0035	20	0.0523
30	0.0252	28	0.0126	26	0.0034			27	0.002	27	0.0709
31	0.0056	29	0.0061	29	0.0017			28	0.0031	28	0.0281
32	0.0011	30	0.0050	30	0.0014			29	0.006	29	0.0282
33	0.0058	31	0.0224	31	0.0061			32	0.0003	30	0.0229
		32	0.0027	32	0.0007			33	0.001	31	0.0671
		33	0.0206	33	0.0056					32	0.0083
										33	0.0255
40	0.2382	40	0.5682	40	0.1558	40	0.3355	40	0.44339	40	0.6173
100	131.19	100	357.90	100	96.25	100	180.50	100	5413.53	100	168.48

Table 3- Inflated Coefficient Matrix for Pakistan at 1969/70 Prices

J/I	28 Coal & Petrol Products	29 Electricity & Gas	30 Transport	31 Trade	32 Government	33 Services n.e.s.
16	0.0024	21 0.0097	09 0.0001	11 0.0003	04 0.0026	11 0.0031
17	0.0066	22 0.005	11 0.0048	12 0.0002	10 0.0002	12 0.0022
20	0.0334	28 0.0216	12 0.0034	29 0.0025	11 0.0037	16 0.0002
25	0.0005	29 0.2554	16 0.0003	30 0.0127	12 0.0027	17 0.0004
28	0.1299	32 0.0003	17 0.0008	32 0.004	16 0.0006	20 0.0001
29	0.0025	33 0.0019	23 0.1029	33 0.026	17 0.0018	21 0.0005
30	0.0752		24 0.0283		20 0.0013	22 0.0003
31	0.1053		28 0.2058		21 0.0002	27 0.0016
32	0.0003		29 0.0001		22 0.0001	29 0.003
33	0.0203		32 0.0006		27 0.0016	30 0.0148
			33 0.0033		28 0.0114	32 0.0074
					29 0.0157	33 0.007
					30 0.091	
					32 0.0582	
					33 0.003	
40	0.3764	40 0.2939	40 0.3527	40 0.0457	40 0.1941	40 0.0406
100	385.26	100 424.78	100 2401.74	100 3818.37	100 1890.84	100 2694.28

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