Growth and Structural Change in Pakistan Manufacturing Industry, 1954-1964

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INTRODUCTION

It has been evident for some time that Pakistan has enjoyed a rate of growth of its large-scale manufacturing sector that is indeed enviable. Some efforts have been made to study and understand this process both in terms of aggregate growth [20] and with reference to specific industries and policies [6]. In addition, a point of view has grown up in unofficial [21] and in official circles [16; 17; 18], that due to tariff and licensing policies, growth in manufacturing industry in Pakistan has proceeded via import substitution in light, consumer goods industries, that the possibilities for further growth in these directions are now extremely limited, that the export markets for such goods are small (due to a variety of reasons) and that future growth must take place via import substitution in intermediate goods and primarily in capital goods industries. As yet, little empirical work has been done to examine the various parts of this point of view.

The purposes of the present paper are twofold. First, we have made a few simple improvements in the data on industrial growth and have collected such data as are available on production, imports, and exports of manufactured goods at a somewhat disaggregated level. Second, we have made some simple analysis of the patterns of manufacturing growth and discussed a few relationships that seem to have influenced the direction of industrial expansion over the past decade. In the latter part of the paper, we have re-examined the generally accepted point of view about industrial growth.

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I. DATA, DEFINITIONS AND ESTIMATES

In the analysis made below, we have chosen three years on which to base our statistical work. The first is an average of 1954 and 1955, which serves as a base year and is referred as "1954/55" hereafter. Censuses of Manufacturing Industries (CMI) were taken in each of these years, and there is some degree of firmness in the import/export data for these years as well. Fiscal[1] 1959/60 is the second year chosen. Again, there is a CMI in that year on which to base estimates of output at a disaggregated level. 1959/60 was the last year of the First Five-Year Plan, and, as we shall point out, there is very different behaviour of the series before and after 1959/60, due to fundamental changes in that year in economic policy, the flow of foreign aid, the level of investment, and other magnitudes of importance. The final year chosen is fiscal 1963/64, the most recent year for which data are relatively complete and available. Detailed work on industrial structure has been done in the Planning Commission for 1963/64, and we have relied exclusively on their data for a number of key sectors.

The exact data sources and the methods used in improving estimates of output are given in Appendix A. There are, however, a few points that should be made here. First, we have tried to use data from tax collections as well as production and price data from the CSO to improve estimates of output by industry for the years under study. The rule of thumb we have used was to accept the higher estimates, whenever two or more reasonable estimates of output for an industry could be obtained. Second, we have adjusted the data on exports for 1959/60 and for 1963/64 to take account of the effect of the export bonus scheme. This has meant an upward revision of the rupee value of export receipts from manufactures, though the amount of the upward revision varies from industry to industry. Third, we have adjusted the figures on imports and domestic production upward to take account of indirect tax collections that drive a wedge between imports *c & f* and imports at market prices, or between production at factor cost and production at market prices. The resulting figures "at market price" *do not* include trade and transport margins. However, the use of "market price" figures is a much more meaningful measure than *c & f* or factor cost figures when comparing the relative shares of domestic production and imports in total supply. The latter is also the justification for adjusting export values for bonus receipts. If producers base decisions to export or to sell domestically on price received from exporting, then stating export values at *f.o.b.* prices would undervalue exported goods relative to the same goods sold in domestic markets.

[1] Fiscal years in Pakistan begin July 1 and end June 30.

All data used here are expressed in current, not constant, prices. Some of the observed changes in supply and demand will, therefore, be due only to changes in prices or in indirect taxes. The latter problem is particularly acute in the import data, since domestic market prices of imports are much higher than *c & f* price *plus* duties[2], and there is a general feeling that the "scarcity premium" on imported goods has been falling over time[3]. Our only justification for the use of current prices is that price indices at the detailed level of our output and import data are simply not available. Thus, not only do our results mis-state demand and supply movements in the aggregate, but more important, the lack of any adjustment for *relative* price changes will mean that differential movements we find between industries (may in part be due to changes in relative prices only, and not due to changes in real flows of goods. To soothe the reader (and ourselves) somewhat, however, we should note that *i*) even if we could make adjustments for relative price changes among industry groups, there would still be the problem of intra-industry price and compositional changes that "distort" the results, and *ii*) the changes in absolute and relative prices do not seem to have been substantial[4].

II. INTERPRETATIONS OF INDUSTRIAL GROWTH IN PAKISTAN

When the Korean War boom ended in the early 1950's Pakistan's economy underwent a radical change, the effects of which are still being felt in both administrative and economic terms. As export earnings declined, it became necessary to restrict imports to avoid a disaster in the balance of payments. The method chosen was an extremely comprehensive and rigid set of direct administrative controls on imports[5]. Imports of "non-essential" consumer items were restricted severely while imports of capital goods were treated more liberally. Also, licences to import consumer goods were scaled downward as the domestic production of substitutes was increased. Tariffs were generally high, and were higher on finished consumer goods than on intermediate products and were lowest on capital goods [22].

It has been argued by Power [21] and Radhu [22] that such a system of priorities encouraged the domestic production of consumer goods using imported capital goods and raw materials. In addition, it has been argued by

2 *See*, the study done for recent years by Pal [19] for the extent of the scarcity premium.

3 The result is that our measure of "market prices" fails to measure the decline in the premium for imported goods. The matter is discussed in Appendix A.

4 Using Papanek's data with 1959/60 equal to 100, the wholesale price index for manufactures was 89.1 in 1954/55 and 105.7 in 1963/64. The rate of overall increase in manufactured goods price was less than 2 per cent per year [20]. In addition, there do not seem to have been any movements in relative prices among manufactured goods over the period substantial enough to offset our results.

5 For a discussion of some of these controls, *see* [9].

Power [21] and Khan [6] that such a system has also led to "excessive" consumption and has thwarted the goal of increasing domestic saving. The Power-Khan-Radhu point of view, which has been adopted almost completely by the Planning Commission in its documents, can be briefly stated (with a few embellishments) as follows.

At the time of the partition of the Indo-Pakistan sub-continent in 1947, virtually all the industrial capacity of the region was located in the areas that became India, while two of the important raw-material producing areas were located in Pakistan, cotton in the West and jute in the East. The hostility between the two new countries led to a rapid curtailment of the trade previously carried on[6]. Shortly thereafter, the collapse of export earnings in Pakistan led to tight import and export controls with all countries. The situation thus created was one of rather extreme disequilibrium in a number of critical markets. The exchange rate was kept pegged at its post-Partition price, and even without the pressure of development expenditure, the fact that most manufactured consumer goods had been imported led to a severe excess demand for foreign exchange. In the markets for goods the prices of major manufactured consumer items appear to have risen substantially following the exchange crisis and ensuing import restrictions[7]. Tariffs were relatively high on consumer items, and it is difficult to separate the effects of licensing and tariffs in determining which import-restricting protective device was more important.

Investors in domestic consumer goods industries faced an extremely favourable situation, for several reasons. First, there was considerable excess demand for consumer goods which had previously been imported, and it is quite likely that consumption levels of the goods in question, particularly cotton textiles, were below what they had been under conditions of relatively free trade within undivided India and during the period when foreign exchange earnings were high[8]. The effect of the excess demand and the rapidly tightening import picture was to raise the relative prices of those consumer goods which were in restricted supply, making investment in those industries profitable relative to other industries. Second, duties on raw materials and particularly, on capital goods were relatively low and investors who secured import licences were able to purchase

[6] For an extended discussion of the development of interwing trade, *see* [1].

[7] Another study at the Pakistan Institute of Development Economics [7] is investigating, insofar as data availability permits, the price movements connected with the trade and production movements discussed here. Reference to price movements are based on that study.

[8] One can criticise the approach taken by Khan [6] for such reasons. There the physical consumption of items in the base period (after the collapse of export earnings) is taken as "normal" while it is quite likely that it was below previous levels. If this is correct, a part of what Khan calls "consumption liberalization" was simply returning to previous levels of consumption.

equipment at rupee costs well below those that would have prevailed if the total value of foreign exchange allocated to those items had been auctioned freely. The relatively low capital outlay combined with high prices of final products meant high rates of profit in the consumer goods industries. Thus, import substitution was encouraged most strongly in "non-essential" consumer commodities, and was discouraged both by licensing and by tariff policy in intermediate and capital goods industries.

By 1954, when our data begin, a great deal of "import substitution" had already taken place in major consumer goods industries, such as cotton textiles, and some capacity had been created in jute textiles to utilize domestically produced raw jute. Thus, when the full effects of the exchange crisis hit and inventories built up during the Korean Boom had been worked off (price data suggest this occurred by 1953/54) Pakistan was in a somewhat different situation than at the time of Partition. Beginnings in large-scale manufacturing had been made in a variety of major consumer goods industries depending on domestic raw materials (sugar, vegetable oils, cotton textiles, and matches principally) while most intermediate goods (petroleum products, chemicals, fertilizers, non-metallic minerals, *etc.*) were provided primarily by imports, and virtually all capital goods and metallic mineral products were of foreign origin.

The argument given by Power and others about the incentives for import substitution and for growth of domestic capacity in intermediate and capital goods, however, seems to neglect an important characteristic of the Pakistan economy in the late 1950's. It was certainly true that imports of intermediate and capital goods were more lightly taxed and more liberally licensed than consumption goods. From all indications, however, there was still considerable excess demand for imports of these types of goods, which one would think should have spilled over into demand for domestically produced goods. If, as suggested by Power, there was a great deal of inefficiency and low rates of profit in the domestic production of consumption goods, surely it must have been profitable to use some of the imported capital and intermediate goods for domestic production of other capital and intermediate goods. We now know that there was a mild sort of agricultural revolution taking place in rural West Pakistan with regard to privately installed tubewells in the late 1950's [4]. Casual observation in the Punjab indicates that tubewell installation was preceded by a rapid spread of low-speed diesel engines used for wheat milling. Much of the equipment for both of these developments was produced in Pakistan. If these are at all symptomatic of what was going on in other sectors, demand for relatively simple capital equipment was growing, and there must have been substantial growth in the domestic capital equipment industries. Such a line of reasoning seems to be

quite consistent with the fact that imports of capital goods were tightly licensed and that they depended on prior sanctions of the proposed investment by a variety of government agencies[9].

Beginning in 1959/60, development expenditures were accelerated, and there was a rapid increase in the inflow of foreign capital with a corresponding "liberalization" of imports. The "liberalization" took the forms both of greater flows of imports and of a somewhat greater dependence on market determination for allocating those imports. The largest increases in imports (other than PL 480 agricultural commodities) have been in capital goods and in processed raw materials and intermediate products, particularly iron and steel items. Increases in imports of consumption goods also took place, notably under the export bonus voucher system. In the Second Plan period, we have seen *i*) a very great acceleration in the direct and indirect demand for manufactured goods resulting from the rapid increases in investment activity, *ii*) a rapid increase in real income in agriculture in both provinces, which presumably led to increased demand for manufactured consumer goods, and *iii*) a very substantial increase in the availability of imported raw materials (particularly iron and steel) and machinery. Since all three of these factors are substantial deviations from the situation in the late 1950's we should expect that there would be different behaviour in major industries and groups of industries between the two periods in the extent of "import substitution" and the extent to which increases in domestic demand were met from domestic production. In the first period, one would expect to find import substitution in most industrial sectors due to the relatively slow growth of imports and the excess demand for all types of goods previously imported, which meant virtually all manufactures. Since there was an acceleration both in imports and in domestic demand, which began around 1959/60, one would expect to find relatively little "import substitution" in capital and intermediate goods industries generally, and, indeed, if domestic production of such goods was rising as rapidly as imports, it should be a source of some satisfaction or at least relief. As the rate of increase in imports slows down in the next five years or during the Third Plan period one would expect that the "import substitution" process would pick up again in the intermediate and capital goods industries in order to meet the continuing increases in domestic demand for these goods. The questions we wish to address in the following sections are: 1) to what extent does the actual production, import, export and domestic absorption data on various groups of consumer, intermediate and investment goods fit the generally accepted hypothesis or the modification we propose; 2) what has been the direction of output growth, import substitution, export expansion and domestic absorption; and 3) how have changes in the flows of imports and domestic development expenditure as well as changes in economic policy, affected the pattern of industrial growth?

[9] A number of observers including Haq [5], and Papanek [20] have emphasized that the fall in estimated investment in the late 1950's was due to tight licensing of capital goods.

III. GROWTH IN OUTPUT AND VALUE ADDED

Before discussing "causes" or "sources" of industrial growth, we will give a summary of the pattern of growth over the period under study. The percentage increases in gross value of output and in value added in current prices for the entire period and the two sub-periods before and after 1959/60 are given in Table II. The growth for the first period (1954/55 to 1959/60) seems quite high relative to the national accounts' estimates or to the industrial production index. In order to explain this deviation and to see how our aggregates compare with other estimates of industrial growth, we have shown in Table I three additional estimates of gross value added: Censuses of Manufacturing Industries, the value added estimates from CSO's national accounts, and Papanek's estimates based on his own survey [20].

Our estimates show a considerably higher rate of increase for the entire period than the CSO or Papanek. Almost the entire difference is due to the period 1954/55 to 1959/60. Using comparable figures[10] for Papanek, CSO, and CMI, however, the 1954/55 to 1959/60 growth is reasonably close to ours (120 153, and 147 per cent, respectively, for Papanek, CSO, and CMI, and 143 per cent for our estimates). Thus, the apparent difference between our growth estimates and the aggregates in the production index or the national accounts

TABLE I

COMPARISON OF ESTIMATES OF CURRENT PRICE VALUE ADDED IN LARGE-SCALE MANUFACTURING

Year	Lewis-Soligo	CMI[b]	Papanek[c]	National Accounts[d]
	(.....*in million rupees*.....)			
1954/55	689	583	813(646)	745(578)
1959/60	1,674	1,440	1,539(1434)	1,565(1460)
1963/64	2,994	*n.a.*	2,786(*n.a.*)	2,695(*n.a.*)
1963/64÷1954/55	4.34	*n.a.*	3.43(*n.a.*)	3.62(*n.a.*)
1959/60÷1954/55	2.41	2.47	1.89(2.20)	2.10(2.53)
1963/64÷1959/60	1.79	*n.a.*	1.81(*n.a.*)	1.72(*n.a.*)

a) *See*, appendix tables.

b) CMI less reported value added for grain and rice milling, jute pressing and cotton ginning and baling.

c) Estimates from Papanek [20, p. 467] adjusted by indirect tax collections from our data according to the discussion in [20, p. 468] on the industries (and taxes) to be excluded from his survey, (petroleum products and salt excise). Estimates in parentheses obtained by subtracting CMI value added for grain and rice milling, jute pressing and cotton ginning and baling.

d) 1954/55 estimate from [14]. 1959/60 and 1963/64 estimates are from [18], with 1963/64 figure blown up to current prices by CSO wholesale price index for manufactures. Estimates in parentheses obtained by subtracting CMI value added for grain and rice milling, jute pressing and cotton ginning and baling.

[10] We have omitted jute and cotton pressing, ginning and baling, and grain and rice milling. For 1954/55 and 1959/60, therefore, the other three estimates of value added were adjusted downward using CMI reported value added in those years. Unfortunately, we cannot adjust 1963/64 due to absence of a CMI adjustment figure.

TABLE II

PERCENTAGE INCREASE IN VALUE ADDED AND GROSS OUTPUT

Industry No.	Industry Name	Gross value of output 1954/55 to 1963/64	Gross value of output 1954/55 to 1959/60	Gross value of output 1959/60 to 1963/64	Gross value added 1954/55 to 1963/64	Gross value added 1954/55 to 1959/60	Gross value added 1959/60 to 1963/64
Consumer goods							
2070	Sugar manufacturing	320	95	114	245	91	80
2091	Edible oils	526	129	165	440	140	125
2092	Tea manufacturing	57	12	38	438	224	66
2099	Food manufacturing, *n. e. c.*	81	226	—9	232	153	32
2100	Beverages	87	3	84	35	3	31
2200	Tobacco manufacturing	416	132	133	593	124	210
2311, 2390, 2490	Cotton and other textiles	210	126	37	179	103	37
2314	Silk/art silk textile	179	127	31	189	111	37
2420	Footwear	109	78	21	114	60	33
2500, 2600	Wood and furniture	498	305	52	951	454	90
2800	Printing publishing	221	71	88	236	78	88
3150	Soap, perfume, *etc.*	430	287	28	366	287	20
3191	Matches	106	42	23	78	50	19
3900	Miscellaneous manufacturing	609	136	204	643	147	201
Intermediate goods							
2313	Jute textiles	519	341	40	467	351	26
2700	Paper manufacturing	437	172	99	449	166	107
2900	Leather manufacturing	410	342	16	330	187	50
3000	Rubber and rubber products	306	89	63	293	132	70
3114	Fertilizer	2729	541	341	4198	688	445
3199	Chemicals and pharmaceutical	615	273	95	749	328	99
3200	Petroleum and coal manufacturing	369	62	188	248	68	107
Investment and related goods							
3300	Non-metallic minerals	330	147	78	448	181	95
3400	Basic metal	720	99	314	1165	178	356
3500	Metal products	444	180	95	683	223	143
3400, 3500	Combined	578	141	182	891	203	267
3600	Machinery except electrical	877	317	134	999	335	153
3700	Electric machinery equipment	1317	435	174	1609	410	235
3800	Transport equipment	1030	541	76	688	431	48
	Total manufacturing:	316	142	72	334	143	79
Industries primarily producing							
	Consumption goods	242	111	62	233	106	62
	Intermediate goods	435	419	62	445	227	67
	Investment and related goods	593	208	125	774	245	154

Source: Computed from Appendix Tables A-2, A-3 and A-4. Classification of industry groups follows Chenery [2] with minor changes.

is due largely to the omission of four industries that were relatively large in 1954/55 but which grew more slowly. Since the 1963/64 estimates from the CSO and Papanek are based on production indices with 1959/60 base weights, when the four industries were relatively much less important, the other estimates are much closer to ours than in the first period. One can easily see from Table I the effect of our upward adjustments on the level of current price value added. Our estimates are higher for all three years than any of the other estimates, even though for 1963/64 we exclude four industries presumably included in the other estimates.

The summary data on growth of the various industries in Table II point up some interesting and important results despite the fact that they are in current prices and that they exclude four industries whose growth in the first period was relatively slow. First, there is an extremely wide range of growth rates for different industries. Second, there has been a general deceleration in the *rate* of growth of most industries, of total industrial output and of the sub-groups of industries producing primarily consumer, intermediate, and investment and related goods, respectively. Third, the consumer goods industries have been growing at relatively slower rates than both other sub-groups of industries. Fourth, there is a difference between the two periods (before and after 1959/60) with regard to differential growth rates of the industries classified by the type of the goods produced. In line with the simple model discussed earlier, it is obvious that the industries producing primarily intermediate and capital goods grew at a much more rapid *rate* relative to the "protected" consumer goods industries in the first period than in the second period. In the latter period, industries producing primarily intermediate goods grew at a slower rate, very close to that for consumer goods industries. Industries producing investment goods, however, grew in both periods twice as rapidly as consumer goods in terms of gross output, and two-and-one-half times as rapidly in terms of value added. Fifth, looking at the dispersion of growth rates within industrial sub-groups in each period, it is fairly clear that the high growth rates for "investment and related goods" industries were a general phenomenon in all such industries, and that the high growth rate is not simply the result of domination of the group by one industry.

It would seem on the basis of a quick glance at the growth of various industries that one would have to be exceedingly careful of condemning industrial policy in terms of growth *rate* performance, since on that criterion, the "basic" "heavy", "producer goods" industries have been performing quite remarkably. Of course, one can say that the weight of these industries is still small relative to both the output of final consumer goods and the imports of competing "producer" goods, and that the high growth rates are meaningless because the base

output is small. It would seem, however, that the "producer goods" subsector of the economy has most certainly not been stagnant, and that its growth bears closer examination.

IV. STATISTICAL METHODS AND FRAMEWORK OF ANALYSIS

The method used in the following sections to determine sources of industrial growth parallels, with some modifications, that used by Chenery in his "Patterns of Industrial Growth",[2]. There, import substitution is defined with reference to the proportion of imports in total supply. If domestic production rises faster than imports, then import substitution is taking place; if imports rise more rapidly than domestic output, the opposite of import substitution (negative import substitution or "import liberalization")[11] is occurring. Chenery apportions the growth in domestic output *i*) to the growth in demand (on the assumption that a constant proportion of total supply is imported) and *ii*) to the change in the ratio of imports to total supply, which he calls import substitution.

One way of formalizing this division of the growth in domestic production is as follows. First we begin with the identity:

$$(1)\quad \Delta Z = \Delta Q$$

where Z equals total supply and Q equals total demand. Total supply is equal to domestic production X *plus* imports M while total demand is equal to the sum of final domestic demand (including inventory accumulation) D, export demand E, and intermediate demand W. Substituting these variables into (1) we get:

$$(2)\quad \Delta X + \Delta M = \Delta D + \Delta W + \Delta E$$

$$\text{or } (3)\quad \Delta X = \Delta D + \Delta W + \Delta E - \Delta M$$

Given the change in total demand, the change in domestic output which would have taken place, if there had been no import-substitution is given by:

$$(4)\quad u_1\ (\Delta D + \Delta W + \Delta E)$$

when $u_1 = \frac{X_1}{Z_1}$ *i.e.*, the ratio of total domestic production to total supply in the base period. In other words, if Pakistan continued to import in the later period the same proportion of its total supply as in the base period, the change in domestic output which would have been required to satisfy the given change in total demand is given by Expression (4).

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[11]Current usage in Pakistan defines import liberalization as any increase in the value of imports. If import liberalization is to be defined in terms of the size of the import bill, a more realistic definition would relate imports to total supply or to domestic production.

Expression (4) could be separated into three parts so that two could further ascribe changes in domestic output to changes in the various components of demand. Because there is inadequate data to allow separation of domestic final demand and intermediate demand, we have combined these into a single variable. Expression (4) becomes:

$$(5)\ u_1 \triangle (D+W)+u_1 \triangle E$$

The change in domestic output ascribed to import substitution is measured by the change in domestic output implied by the actual change in the proportion of total supply imported, when total demand is held constant. The total increase in output is given by:

$$(6)\ \triangle X=u_1 \triangle(D+W)+u_1 \triangle E+(u_2-u_1) Z_2$$

where $u_2 = \frac{X_2}{Z_2}$ the ratio of domestic output to total supply in the later period.

The change in domestic output has now been broken into three parts: expansion of *i*) domestic and *ii*) export demand where the ratio of imports to total supply is held constant at its base period level, and *iii*) import substitution. In order to facilitate inter-industry comparison of the relative contribution of each factor to the change in output one can divide both sides of Equation (6) by $\triangle X$, to express the contribution of each factor as a per cent of the total change in industry output.

Equation (6) is used to isolate the components of domestic growth to some twenty-six manufacturing industries, separately. The importance of these three components for the large-scale manufacturing sector as a whole is derived by adding up the components for each industry:

$$(7)\quad \triangle X_m = \sum_j \triangle X_j = \sum_j u_{1_j} \triangle (D_j+W_j) + \sum_j u_{1_j} \triangle E_j + \sum_j (u_{2_j}-u_{1_j}) Z_{2_j}$$

where $\triangle X_m$ is equal to the change in output of the manufacturing sector as a whole and the subscript j refers to the individual manufacturing industries.

Equation (7) is also applied to various components of the manufacturing sector. All industries have been classified into one of the following three groups: *i*) consumer goods, *ii*) intermediate goods and *iii*) investment goods and related products. For each group we have estimated the proportion of growth in domestic output which is attributable to the three variables of Equation (7).

Analysis of the Growth in Value Added

The preceding discussion has been carried out in terms of gross value of domestic output. For some purposes it is more meaningful to analyse the growth

in value added, for the latter measures the contribution of domestic factors of production to output.

The changes in value added can be attributed to the same "sources" as the changes in gross output. In addition to changes in demand, however, it is also necessary to take account of the changing relationship between value added and gross output over time and between industries. It is precisely because of changes in this latter variable that it is interesting and necessary to carry out separate calculations using value added. If the ratio of value added to gross output were to remain constant over time then, for any industry, the proportion of the change in gross output attributable to any "source" would be the same as the proportion of the change in value added which would be apportioned to that "source". Similarly, for manufacturing as a whole, a separate analysis of changes in value added would not be necessary if the ratio of value added to gross output were the same for all manufacturing industries. Different ratios for different industries means that, over time, as different industries grow at different rates, the ratio for the sector as a whole will change even if for each industry the ratio does not change.

The question used to allocate the change in value added to various factors is given by:

$$(8)\ \Delta V = u_1 r_1 \Delta(D+W) + u_1 r_1 \Delta E + (u_2 - u_1) r_1 Z_2 + (r_2 - r_1) u_2 Z_2$$

where r is the ratio of value added to gross value of output at market price and V is value added.

The first two terms measure the change in value added due to the change in domestic and export demand, respectively, when both the ratio of domestic production to total supply and the proportion of value added in domestic production are the same as in the base period. The third term measures the importance of import substitution (the amount by which value added changes when the ratio of domestic production to total supply changes and when the proportion of value added to gross output remains at its base period level). The last term in Equation (8) measures the effect on value added of changes in the ratio of value added to domestic output. The term is essentially a residual, as it measures, among other things, the effect of intra-industry changes in the composition of domestic output as well as changes in technical efficiency. These factors are usually grouped together and called "technical change".

V. SOURCES OF GROWTH IN GROSS OUTPUT

The sources of output growth are discussed here for the period 1954/55 to 1963/64, and for the two sub-periods before and after 1959/60. Expansion of

domestic and export demand and import substitution are the "sources" of growth examined. Summary data for the three periods are presented in Table III.

TABLE III

SUMMARY SOURCES OF OUTPUT GROWTH BY SUB-GROUPS OF INDUSTRIES AGGREGATED FROM INDIVIDUAL INDUSTRY STATISTICS

(1)	ΔX (2)	$u_1(\Delta D + \Delta W)$ (3)	$u_1(\Delta E)$ (4)	$(u_2 - u_1)Z_2$ (5)	Col. (3) ÷ Col. (2)	Col. (4) ÷ Col. (2)	Col. (5) ÷ Col. (2)
1954/55 to 1963/64							
Consumption goods	3,406,414	2,619,472	244,079	542,682	76.9	7.1	15.9
Intermediate goods	1,451,438	554,947	544,268	352,209	38.2	37.5	24.3
Investment and related goods ...	1,363,880	1,147,612	13,355	203,992	84.1	1.0	15.0
Total 26 industries	6,221,732	4,322,031	801,702	1,098,883	69.5	12.9	17.7
1954/55 to 1959/60							
Consumption goods	1,570,785	874,629	258,892	437,428	55.7	16.5	27.8
Intermediate goods	663,344	225,484	383,972	53,807	34.0	57.9	8.1
Investment and related goods ...	459,017	329,549	4,741	124,692	71.8	1.0	27.2
Total 26 industries	2,693,146	1,429,662	647,605	615,927	53.1	24.0	29.9
1959/60 to 1963/64							
Consumption goods	1,835,629	2,019,640	—19,847	—164,072	110.0	—1.1	—8.9
Intermediate goods	788,094	375,129	171,505	241,532	47.6	21.8	30.6
Investment and related goods ...	904,863	981,575	10,948	—86,544	108.5	1.2	—9.6
Total 26 industries	3,528,586	3,376,344	162,606	—9,084	95.7	4.6	—.3

Note: A small calculation error appears because u_1 and u_2 were rounded to three places.

Source: Appendix tables.

Consider first the rows for all manufacturing industry. A striking difference between periods one and two is evident. Import substitution accounted for one-sixth and export expansion for one-eighth of output growth over the entire period. Virtually, all of the increase due to import substitution and export expansion occurred during the first period, however, when each source contri-

buted over one-fifth of output growth. In period two domestic demand was the cause or source of virtually all expansion in domestic output. Given some statistical error, one could not argue with confidence that the contribution of factors other than domestic demand was significant in the second period.

The important differences in the behaviour of the two periods and the differences among major industries and industrial sub-groups are also brought out in Table III, where we have aggregated from our twenty-six industries to the three groups producing consumer, intermediate, and investment and related goods. The top panel of the table shows that for the entire period, import substitution was of equal importance (about 15 per cent) for both consumer goods and for investment goods industries and was a source of almost a quarter of the growth of the intermediate goods industries. Import substitution in intermediate goods industries occurred principally in petroleum refining, chemicals, and paper manufacturing (*see*, appendix tables). The export expansion was of major importance in intermediate goods, primarily as a result of the growth of the jute textile industry.

The lower panels of Table III are of interest in light of the model of growth of the Pakistan economy presented in Section II above. In the period 1954/55 to 1959/60, import substitution was as important in the investment goods industries as it was in consumption goods industries, in percentage terms, and there was some import substitution in intermediate goods as well. From 1959/60 to 1963/64, however, a completely different pattern emerged. Although growth of the "heavy" industries, as noted in the last section, continued to be very rapid, growth in imports of competing items was even more rapid, so that there was negative import substitution. Consumption goods production did not increase as rapidly in percentage terms during the second period but domestic demand rose more rapidly resulting in a relative decline in exports[12] and an increase in imports of such items. The heavy export orientation of intermediate goods industries in both periods is due to jute textiles, while the large amount of growth attributable to import substitution in the second period was due primarily to petroleum products.

In order to see at a still more disaggregated level what has been happening in the industry sub-groups one should refer to Appendix Tables B-1, B-2 and B-3. For the entire period and the sub-period 1954/55 to 1959/60 most of the intermediate and investment goods industries had a higher per cent of growth "explained" by import substitution than was true for the total of all manufacturing industries. In basic metals and metal products, imports and domestic production

[12] The decline in exports is due primarily to cotton textiles.

grew at similar rates in both periods, so that there was no import substitution, despite very substantial growth in domestic production. One of the poor performances with regard to import substitution was given in both periods by non-metallic mineral products, an industry dominated by cement production.

While it is true that the greatest opportunities for further import substitution exist in intermediate goods and investment goods industries, it is incorrect to say that there has been little or no import substitution in these industries to date. In fact, the rapid growth rates of these industries were to a significant extent due to import substitution. In addition, it is fairly clear that, despite the shakey nature of the statistics, there are two fairly distinct periods with a break around 1959/60. The data are not inconsistent with the view outlined in Section II above, that the excess demand for imported investment goods, particularly, spilled over into the domestic markets and stimulated domestic production of those goods. In the period since 1959/60 there has been less import substitution, but the growth of producer goods industries has been rapid and has almost kept up with the increased demand arising from very marked acceleration in investment activity[13]. In intermediate goods industries the picture is less clear, and performance is dominated by movements in a few industries. Even there, however, paper, fertilizer, chemical and petroleum products have grown to a large extent because of import substitution.

IV. SOURCES OF GROWTH IN VALUE ADDED

A skeptic will still object that, despite the good showing in growth rates and reasonable performance in import substitution, intermediate and investment goods industries are too small to be of real consequence. The appropriate place to look for information on this issue is at value added, since that is a measure of the industry's contribution to national income. Table IV gives the value added by major industrial groups and the percentage distribution of value added for each of the years, under study. The influence of the differential growth rates of the three groups is obvious, as the importance of consumption goods industries fell to just over half of value added in large-scale manufacturing by 1963/64,

TABLE IV

GROSS VALUE ADDED BY INDUSTRY GROUPS

(CURRENT PRICES)

	1954/55	Per cent	1959/60	Per cent	1963/64	Per cent
Industries producing	(*000 Rs.*)		(*000 Rs.*)		(*000 Rs.*)	
Consumer goods	490,185	71.1	1,008,465	60.2	1,634,242	54.6
Intermediate goods	115,809	16.8	378,540	22.6	631,420	21.1
Investment & related goods	83,414	12.1	287,540	17.2	728,832	24.3
Total manufacturing	689,409	100.0	1,674,458	100.0	2,994,494	100.0

Source: Appendix Tables A-2, A-3, A-4.

[13]Gross investment (in 1959/60 prices) rose from Rs. 2,200 to Rs. 3,430 million from 1954/55 to 1959/60, then almost doubled to Rs. 6,350 million in 1963/64. (Figures are taken from [18] and [17]. In current prices the acceleration is even larger.

TABLE V

PERCENTAGE DISTRIBUTION OF GROWTH IN VALUE ADDED BY "SOURCE" AND BY INDUSTRY GROUP

	$r_1u_1(\Delta D + \Delta W)$	$r_1u_1\Delta E$	$r_1(u_2-u_1)Z_2$	$(r_2-r_1)X_2$	ΔV
1954/55 to 1963/64					
Consumption goods	35.75	4.71	10.44	—1.31	49.6
Intermediate goods	8.80	9.64	5.09	—1.41	22.4
Investment and related goods	18.14	0.23	3.88	5.76	28.0
All industries	62.7	14.6	19.4	3.3	100.0
1954/55 to 1959/60					
Consumption goods	31.15	10.76	16.51	—5.79	52.6
Intermediate goods	8.67	15.30	2.20	0.50	26.7
Investment and related goods	12.52	0.18	5.62	2.38	20.7
All industries	52.3	26.2	24.3	—2.9	100.0
1959/60 to 1963/64					
Consumption goods	45.1	—	—1.14	3.44	47.40
Intermediate goods	10.8	6.06	6.00	—3.69	19.17
Investment and related goods	30.6	0.36	—2.73	5.22	33.45
All industries	86.5	6.42	2.13	4.97	100.0

Source: Computed from Appendix Tables C-1, C-2 and C-3.

while intermediate goods contributed over one-fifth and investment and related goods almost one-quarter. The consumer goods industries still dominate the industrial picture and textiles (except jute and silk) account for more industrial value added than all the investment goods industries. Nevertheless, the change in economic structure has been quite marked.

Table V gives the distribution of the growth in value added over the total period and the two sub-periods, both by industrial group and by "source" of value added growth calculated by the methods explained in Section III above. The top panel indicates that almost one-fifth of the total growth was accounted for by import substitution and about 15 per cent by export expansion. Less than half of the growth in value added was accounted for by the consumer goods industries. Again, there is a fairly striking difference both in the importance of export expansion and import substitution and in the relative importance of the industrial groups in the two sub-periods. From 1954/55 to 1959/60 almost a quarter of growth in value added could be attributed to export expansion and another quarter to import substitution, while after 1959/60 almost seven-eights

of the growth in value added went to meet growth of domestic demand. Investment goods industries provided about one-fifth of the growth in value added in the first period, and they were the source of over one-third of the growth of value added in the Second Plan period.

There has been a substantial differential in the rate of growth of industries producing consumer, investment, and intermediate goods, with the latter two growing much more rapidly. A substantial portion of the growth in each of these industries was attributable to import substitution, particularly in the period before 1959/60. The rapid growth of intermediate and investment goods industries has meant that they now contribute substantially both to value added and to the growth of value added in large-scale manufacturing.

VII. SUMMARY REMARKS AND CONCLUSIONS

Before summarizing the general findings we should mention again some of the difficulties of the analysis. The data on domestic supplies deal only with so-called large-scale manufacturing, and omit an unknown quantity of small-scale industry with an unknown rate of growth and an unknown distribution among industries[14]. A part of what we call and measure as import substitution, therefore, may be due either to output previously unrecorded in the statistics, or to output that is simply displacing small-scale industry, although this is not represented in any available statistics. On the other hand, there is a very serious understatement of the total supply of imported goods at current prices because we have not accounted for the scarcity premium (above normal trade margins) on imported goods. Since most observers agree that the scarcity margin has declined substantially, particularly during the period after 1959/60, imports are understated proportionally more in the earlier periods. Thus, import substitution would be understated. While these two principal defects do work in opposite directions, there is no way of telling the extent of offset. The figures presented on the "source" of growth, therefore, should be taken at best as indications of the orders of magnitude involved.

The principal conclusions of the analysis may be summarized in the following way:

i) The extremely rapid rate of growth of large-scale manufacturing has been maintained due to more rapid growth of intermediate and investment goods industries over the past decade.

[14] Such a strong statement may sound unwarranted. The small-scale industry statistics are not reliable, however, even when they exist, and the growth rate in the national accounts is an assumed growth rate related to population growth. Our discussions with Eric Gustafson, who is studying small-scale industry statistics closely, have enlightened in this matter, but he should not be held responsible for our own statement.

ii) In almost every major industrial group "import substitution" has been a source of growth. Import substitution was more important in the period before 1959/60 than it has been since.

iii) Intermediate and investment goods industries still present the greatest scope for further import substitution, since imports are a larger proportion of total supply of these goods. However, a good deal of progress has been made to date and a base of some magnitude has been developed domestically in these industries.

iv) In the period since 1959/60 domestic demand has grown so rapidly that import substitution has not proceeded in consumer and investment goods industries and the growth in exports from the consumer goods industries has been choked off.

On the basis of the statistical analysis used here, and subject to the limitations of the definitions and the data adopted, we think it would be difficult to accept the widely held hypothesis about the distorted nature of industrial growth in Pakistan up to now. There has been substantial growth and there has been import substitution in major intermediate and investment goods industries. This is not to say that the most efficient use has been made of resources invested in industry, or that growth has proceeded according to comparative advantage, or that there have not been distortions, nor does it say that the policy *as intended* was incorrect. As suggested in Section III, the results of industrial growth have been more in line with those desired by the critics of industrial policy because of two phenomena: *i*) extreme excess demand for imports of intermediate and investment goods before 1959/60[15] which encouraged both growth and import substitution in those industries, and *ii*) very rapid growth in domestic demand after 1959/60 that sustained demand for domestically produced intermediate and investment goods despite substantial increases in imports of competing goods. The policy of protecting consumer goods industries to a much larger extent than intermediate and investment goods industries was nullified by the enormous excess demand for imports and disequilibrium in the foreign exchange markets.

If our evidence in conflict with the generally accepted view of industrialization and our analysis of why that view proved wrong are substantially correct, the question arises: what of future policy? Should things continue as they are? While a full statement of industrial policy is well beyond the scope of the present paper, at least one or two major points should be made. Since the scarcity

[15] It should, of course, be noted that a part of the demand for intermediate and investment goods was the profitability of producing consumer goods.

premium (reflecting excess demand) on imports has been falling, it is likely that the tariff structure will play a much larger role in the future in determining the level and composition of demand for imports and the domestic prices of imports and import competing goods. As a result, it will be more important in the future than it has been in the past to be sure that the tariff structure does not distort resource use domestically. As the tariff and export bonus systems presently stand, the implicit exchange rate varies considerably depending on whether one is deciding to invest in export or import competing industries, and it varies within the latter group as well. While tariffs on manufactured intermediate goods now give them an implicit exchange rate very close to the exchange rate for exports on bonus, machinery and industrial equipment are much less well protected, while consumer goods continue to be most favoured with regard to tariff protection. If investment resources are not to be misdirected by tariff-created differentials in profitability, something must be done about raising the implicit exchange rate (or the degree of protection) for investment goods.

Thus, while the generally accepted view of the pattern of industrial growth in Pakistan does not seem to stand up well in light of the analysis of growth presented here, it is likely that the criticism leveled at the growth "strategy" implicit in the tariff and licensing structure will become more important in the future, since a considerable amount of excess demand and licence-created distortion has already been worked out of the economy. The close examination of the incentives implicit in the tariff structure is a matter of much greater priority than it was at the beginning of the Second Plan.

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Appendix A

ESTIMATES OF OUTPUT, IMPORTS, EXPORTS AND INDIRECT TAXES

I. OUTPUT ESTIMATES

There are a number of sources of data on output of manufactured goods in Pakistan. The Census of Manufacturing Industries (CMI) and the physical output data reported by the CSO in its *Bulletin* (CSOB) and its yearbooks (CSOYB) are the most important. Much of the CSO physical output data comes from the Statistical Office of the Central Board of Revenue (CBR) as a by-product of the CBR's excise tax collection. The CSO also collects data from individual manufacturers and from associations of manufacturers in specific industries. For 1963/64 we have also relied heavily on work done by the Planning Commission in constructing a detailed input-output table for that year[1].

The coverage of each series is different for two reasons. First, the intended coverage is different. The CMI has only covered factories with the Inspector of Factories, under Section 2(j) of the Factories Act, 1934, using a definition that excludes power-using establishments employing less than twenty people on all days of the year and those not using power regardless of employment size. The data originating with excise tax collections vary in coverage from industry to industry, depending on the legal definition of the firms to be covered. It is presumed that sales and excise tax coverage is somewhat broader than the CMI for any given taxable commodity. The precise limits for some important industries are given by Radhu [22]. However, certain commodities in almost every industry are not taxable, so that a large part of an industry's output may not appear as output for sales or excise tax purposes. The second principal reason for different coverage is that, given the firms covered, the output actually reported may be different for the CMI and for tax purposes. It is generally believed that output is understated whenever possible by respondents.

In estimating output in our study, we have followed a very simple rule of thumb. Whenever two or more reasonable estimates can be made of output of a particular industry for a particular year, we have chosen the higher estimate as the one likely to be closer to actual output. Such a procedure does not eliminate the problem of undercoverage or underreporting. However, we feel it does give more accurate picture than simply accepting the unadjusted CMI figures.

[1] We are grateful to Wouter Tims and Joseph J. Stern of the Harvard Advisory Group, who have been most helpful and have given us access to data collected by them. Unpublished output data from the Department of Investment Promotion and Supplies and the CSO were used in making their estimates.

Estimates of output and the method we followed can be divided into two groups: years when there were Censuses of Manufacturing Industries, and years when there were not. We have noted in parentheses at the end of each description a small letter. The actual estimates in Table A-1 have one of these letters attached as a footnote, which identifies the source of the estimate used for that year and that industry.

A. Census Years

Four sources of output estimates were used.

1. *Output Reported by CMI*

The output figure with which we are concerned is the gross value of output of the industry, which, neglecting inventory changes, corresponds to gross sales of the industry at current prices. In many cases the CMI output estimates are virtually the only information available on the industry in question, and therefore, had to be accepted(*a*).

2. *Sales Tax Collections*

Sales taxes are assessed on an *ad valorem* basis, and unpublished data from the CBR give a fairly detailed breakdown of revenue from specific commodities. Since the rate of tax is known, dividing the rate of tax into the value of collections gives the value of taxed output of the industry. Since exports of manufactures are exempted from sales taxes, the values of exports of the commodity are added to the value implied by sales tax collections to get another estimate of output of particular commodities or industries(*b*).

3. *Output of Excisable Goods*

Physical output of various commodities is given by the CSO, as are wholesale prices of these items. Another estimate of production is found by multiplying wholesale price times quantity produced and deducting sales and excise tax collections on the items to arrive at a figure fairly close to gross output at factor cost. The difference between the two would be trade or transport margins between ex-factory and wholesale prices(*c*).

4. *Adjustment of CMI by Physical Output*

For several years, the CMI reports the physical output of certain items as well as gross value of output of the industry. Physical output data from other CSO sources can be used to blow up CMI gross output wherever CMI physical output is lower than the physical output estimates of other sources. By taking the ratio of CSO output to CMI physical output and multiplying this by CMI physical output and multiplying this by CMI gross output, we get an estimate of gross value of output more consistent with known physical output(*d*).

In the Census years, whichever of the above estimates gives higher gross value of output has been accepted as the "output" of the industry in question.

B. Inter-censal Years

For years other than those in which CMI results are available, two principal methods were used.

1. *Sales Tax or Excisable Goods Output*

For a large number of commodities one can construct a complete series of output estimates for the entire period under study. Where either of these sources gives estimates consistently higher than CMI output, we have simply adopted the series as an output series. In cases where these output series are below CMI output but where the ratio of CMI to sales or excise implied output is relatively constant, we have blown up the sales/excise implied output by the average ratio of CMI to sales/excise implied output for CMI years to get an estimate of output for inter-censal years(*e*).

2. *Index of Production*

For some inter-censal years we have applied the value of production index to a base in the CMI year. Two kinds of indices have been made.

a. Production and pricex index: CSO has production indices implicit or explicit in its reports of industrial production in various industries. It also has indices of wholesale prices. We have multiplied the production index by the price index and applied it to the base year (a census year) to get value of output in inter-censal year(*f*).

b. Sales tax production index: The estimation of output from sales tax collections and exports was discussed above. These can be used to construct an index of value of output for the industry in question. The index can be applied to the base output in a CMI year(*g*).

II. EXPORT ESTIMATES

The estimates of exports are made in a quite straight forward manner before the introduction of the Export Bonus Scheme in 1959. The data are taken from the annual issues of *Foreign Trade Statistics of Pakistan* (FTSP) published by the CSO, but the 1954 figures are from the CSOB. The export values at *f.o.b.* prices converted at the official exchange rate are given up through 1960 by the FTSP, and for the period after July 1960 they are taken from the CSOB. However, to make the value of exports consistent with the value of output of the industry following the introduction of the Bonus Scheme, each item was adjusted upward by the value of the bonus the industry received. Account was taken both of the

percentage bonus given to each item and of the average premium at which the bonus vouchers were selling. Six-month export figures and six-month averages of the bonus voucher premia were used to make the adjustment. The value of exports after adjustment reflects the value received by the exporter, who in most cases is the producer. It is this value that should be compared with estimates of output. Likewise, when the value of exports is added to the value of output implied by sales tax collections, the adjusted value exports should be used, since it measures the value received by the manufacturer. To use the unadjusted figure would underestimate the share of output exported or the value received by the producing sector.

III. IMPORT ESTIMATES

The estimates of imports by commodity group are taken primarily from published CSO sources. CSO estimates from 1954 to 1956 only include imports on private account, and supplementary reports on government account imports for 1954 and 1955 were based on G. Rasul [23], and from separate estimates of other imports (such as sugar and fertilizer) from other Government Ministries. Although Rasul gives only 1954 figures, the 1955 estimate of total government imports of manufactured goods is almost identical to the 1954 total, so the same distribution was used for 1955 after making separate estimates where other evidence was available. All CSO estimates have been reclassified into the industry groups being used in our study. Data on private account imports for 1954 are from CSOB. Private account imports 1955 and 1956 and all imports from January 1957 to June 1960 are from FTSP for the appropriate years. The period since July 1960 is sufficiently detailed in the issues of the CSOB that cover the full year's imports.

IV. ESTIMATES OF INDIRECT TAXES

The Statistical Office of the Central Board of Revenue maintains records of collections of indirect tax receipts by a fairly detailed commodity classification. Data on Excise and Customs Duties are generally published in the Budget documents and in the CSOB. Data on collections of sales taxes are not published in a detailed classification, but they are available at the CBR Statistical Office. That Office has supplied its unpublished data to the Institute for its research on Pakistan's tax system, and these data have been utilized in our study. More detailed discussions of the coverage of indirect taxes and of the nature of the statistics are found in [22] and [8].

V. OUTPUT AND IMPORTS "AT MARKET PRICES"

In the analysis of our several series of data on output, imports, and exports, we have compared flows of goods at what is called here "market prices". The concept as we have employed it is somewhat different from the input-output definition of gross value of output or of imports. We have simply taken output at producer prices and added indirect taxes on the industry in question to get "output at market price". Likewise, we have added indirect taxes on import commodities to the *c. & f.* value of imports of the commodity to get "imports at market prices". The procedure in both cases omits trade and transport margins. By itself such an omission is not too serious, since, one might argue, trade and transport margins might add a similar proportion to each commodity and, therefore, leave proportional relationships between domestic output and imports undisturbed. In the case of imports, however, there is good reason to believe that trade margins would be much higher than for domestic output, since trade margins would reflect the scarcity of the imported goods in the country. As Pal [19] has shown, these margins could result in a very significant difference between estimates of imports "at market prices" as given here and the actual value of imports at market prices. Where imports are tightly licensed relative to demand, *c. & f.* prices plus duties would be an inaccurate reflection of their relative value. For domestic manufacturing, however, there would not be a comparable problem, since ex-factory prices plus taxes would presumably reflect something closer to the scarcity value of the commodities in the country. Thus, trade margins would not be "inflated" to make up for the difference between "cost" and "scarcity value" as they would be in the case of imports.

To get total supply of a commodity we have added imports plus indirect taxes on imports to output plus indirect taxes on output. The result is "total supply at market prices", subject to two principal limitations. *First*, as pointed out in item I above, our output estimates do not cover all manufacturing activity, and omit an unknown amount of output, particularly of small establishments. *Second*, as noted in the preceding paragraph, there is a strong probability that we have underestimated the value of imports by neglecting the difference between landed costs and scarcity values.

VI. ESTIMATES OF VALUE ADDED

In order to see properly the effects of our method of estimating or of correcting output, it is first necessary to convert the figures to value added. Value added estimates were made from our estimates of gross output on the assumption that the ratio of value added to gross output at factor cost reported by the CMI (or, for 1963/64 by the Planning Commission) for the industry in question is a

representative ratio. If we multiply the ratio of CMI value added to CMI gross output by our estimate of gross output, we get a new value added figure. Such a procedure is a bit dangerous, of course, as there may be a greater error in CMI value added than in gross output (or vice versa), or the CMI may not have covered firms representative of those implicitly covered by our upward revision of CMI output. In one or two cases we departed from the procedure outlined here and used the value added to gross output ratio of a different year. This procedure was followed only where the results of the regular correction factor would have led to obvious distortions. The value added figures have been compared with national accounts and other data on large-scale manufacturing industry in the text to show the effect of our adjustments on estimates of national income originating in that sector.

TABLE A-1

ESTIMATES OF OUTPUT AT FACTOR COST

Industry No.	Industry Name	1954	1955	1959/60	1963/64
		(.....*in thousand rupees*.....)			
2070	Sugar manufacturing	94,189*c*	100,964*c*	190,470*c*	383,835*f*
2091	Edible oils	96,230*a*	88,121*a*	211,355*a*	574,294*f*
2092	Tea manufacturing	149,166*a*	115,665*c*	147,935*c*	183,351*f*
2099	Food, *n.e.c.*	16,515	22,379*a*	63,347*d*	64,260
2100	Beverages	17,257*b*	18,620*b*	18,438*b*	26,055*b*
2200	Tobacco manufacturing	73,878*a*	71,400*a*	168,187*a*	404,422*f*
2311 2390 2490	Cotton and other textiles	569,408*a*	694,033*a*	1,428,129*ab*	2,010,320*ft*
2313	Jute textiles	54,398*a*	113,041*a*	369,021*b*	517,874*b*
2314	Silk and art silk	32,255*a*	38,257*a*	80,046*a*	105,509*f*
2420	Footwear	36,816*a*	43,583*a*	71,404*a*	86,220*t*
2500 2600	Furniture and wood manufacturing	2,179*a*	4,403*a*	13,318*a*	20,010*t*
2700	Paper manufacturing	28,351*a*	32,655*a*	82,957*a*	158,730*f*
2800	Printing and publishing	32,508*a*	41,820*a*	63,366*a*	119,160*t*
2900	Leather manufacturing	37,291*a*	36,752*a*	163,755*b*	189,930*ft*
3000	Rubber and rubber manufacturing	13,404*bc*	13,143*bc*	25,216*ab*	42,265*f*
3114	Fertilizer	—	5,697*a*	18,263*d*	80,569*d*
3150	Soap or perfumes	14,492*b*	33,007*a*	91,890*b*	110,671*ft*
3191	Matches	25,073*c*	30,293*a*	39,414*a*	47,490*t*
3199	Chemicals and pharmaceuticals	25,678*b*	46,883*ab*	135,285*a*	261,670*t*
3200	Petroleum and coal manufacturing	71,658*ab*	72,245*a*	116,455*f*	223,010*t*
3300	Non-metallic minerals	60,615*ac*	67,385*ac*	157,908*a*	250,420*t*
3400	Basic metals	41,511*a*	59,801*a*	100,680*a*	408,220*t*
3500	Metal products	50,414*a*	58,180*a*	152,126*a*	291,920*t*
3600	Machinery	11,667*a*	22,251*a*	70,740*a*	165,660*t*
3700	Electrical machinery and equipment	8,942*a*	16,372*a*	67,745*a*	180,460*t*
3800	Transport equipment	19,510*a*	17,797*a*	119,047*a*	207,737*ft*
3900	Miscellaneous manufacturing	11,510*a*	26,518*a*	44,922*b*	138,310*ft*
	Total:	1,594,915	1,891,265	4,211,419	7,252,372

Source: See Appendix A for meaning of the footnotes. The symbol "*t*" for 1963/64 denotes use of estimates from the Tims, Stern, Planning Commission Input-Output Table for 1963/64. The symbol "*ft*" means an index based on "*t*" was applied to our 1959/60 estimates.

TABLE A-2

SUMMARY STATISTICS BY INDUSTRY, AVERAGE OF 1954 AND 1955

(Current Prices)

No. (1)	Industry name (2)	Gross value added (3)	Gross output at factor cost (4)	Domestic indirect taxes (5)	Output at market price (6)	Imports *c&f* (7)	Import taxes (8)	Import at market price (9)	Total supply at market price (10)	Exports *f.o.b.* (11)	Domestic demand (12)
		(..... *in thousand rupees* .....)									
2070	Sugar mfg.	31,420	97,576	11,912	109,488	56,207	54,474	110,681	220,170	—	220,170
2091	Edible oils	11,798	92,175	6,448	98,623	4,157	501	4,658	103,282	—	103,282
2092	Tea mfg.	5,760	132,415	5,075	137,490	1,157	2,132	3,289	140,780	40,597	100,183
2099	Food mfg., *n.e.c.*	8,732	19,447	25,483	44,930	14,355	2,702	17,057	61,987	809	61,178
2100	Beverages	8,645	17,938	3,322	21,260	1,409	7,195	8,604	29,865	3	29,862
2200	Tobacco mfg.	36,537	72,639	26,237	98,876	655	846	1,501	100,378	11	100,367
2311, 2390, 2490	Cotton & other textiles	289,327	631,721	84,600	716,321	102,069	75,394	177,463	893,784	6,126	887,658
2313	Jute textiles	38,344	83,720	3,446	87,166	517	—	517	87,683	49,020	38,663
2314	Silk & art silk textiles	19,250	35,256	2,885	38,141	24,540	26,040	50,580	88,721	—	88,721
2420	Footwear	18,653	40,200	672	40,872	—	82	82	40,954	*n.a.*	40,954
2500, 2600	Wood and furniture	1,251	3,291	353	3,644	5,161	1,755	6,916	10,560	273	10,287
2700	Paper mfg.	12,811	30,503	1,488	31,991	22,477	10,240	32,717	64,708	30	64,678
2800	Printing & publishing	20,738	37,164	—	37,164	3,660	—	3,660	40,824	208	40,616

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2900	Leather mfg.	11,254	37,021	366	37,387	347	38	412	37,800	32,366	5,434
3000	Rubber & rubber goods	5,442	13,273	1,425	14,698	11,612	9,584	21,196	35,894	9	35,885
3114	Fertilizer	658	2,848	—	2,848	11,370	—	11370	14,218	5,332	8,886
3150	Soap, perfumes, *etc.*	8,479	23,750	1,731	25,481	3,904	892	4,796	30,277	23	30,254
3191	Matches	18,852	27,683	6,987	34,670	278	816	1,094	35,764	—	35,764
3199	Chemicals & pharmaceuticals	16,145	36,280	2,405	38,685	86,144	6,995	93,139	131,825	3,974	127,851
3200	Petroleum & coal mfg.	31,155	71,951	27,112	99,063	108,182	76,372	184,554	283,618	10,326	273,292
3300	Non-metallic mineral mfg.	29,056	64,000	4,444	60,444	15,052	1,450	16,502	84,946	427	84,519
3400	Basic metal industries	14,105	50,656	726	51,382	106,591	19,276	135,314	241,568	45	239,715
3500	Metal products	18,624	54,297	575	54,872	9,447				1,808	
3600	Machinery except electric	7,479	16,959	—	16,959	232,998	16,839	249,837	266,796	1,201	265,595
3700	Electric mach. & equipment	5,607	12,657	1,281	13,938	47,231	7,376	54,607	68,516	161	68,385
3800	Transport equipment	8,543	18,653	11	18,664	83,059	31,358	114,417	133,082	1,187	131,895
3900	Misc. mfg. ind.	10,743	19,014	787	19,801	35,242	2,783	38,025	57,827	5,802	52,025
	Total manufacturing	**689,408**	**1,743,087**	**219,771**	**1,962,858**	**987,848**	**355,140**	**1,342,988**	**3,305,857**	**159,738**	**3,146,119**
Industries primarily producing:											
	Consumption goods	490,185	1,250,269	116,492	1,426,761	252,794	149,572	428,406	1,855,173	53,852	1,801,321
	Intermediate goods	115,809	275,596	36,242	311,838	240,676	129,269	343,905	655,746	101,057	554,689
	Investment and related goods	83,414	217,222	7,037	224,259	494,378	76,299	570,677	794,938	4,829	790,109

Sources: See text of Appendix A.

TABLE A-3

SUMMARY STATISTICS BY INDUSTRY: 1959/60

(Current Prices)

No.	Industry name	Gross value added	Gross output at factor cost	Domestic indirect taxes	Output at market price	Import *c. & f.*	Import taxes	Import at market price	Total supply at market price	Exports *f.o.b.*	Domestic demand
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		(.....*in thousand rupees*.....)									
2070	Sugar mfg.	59,998	190,470	24,500	214,970	19	7	26	214,996	4,496	210,500
2091	Edible oils	28,322	211,355	21,682	233,037	7,082	1,088	8,170	241,207	—	241,207
2092	Tea mfg.	18,640	147,935	7,700	155,635	896	88	984	156,619	35,490	121,129
2099	Food mfg., *n.e.c.*	21,981	63,347	25,895	89,242	29,486	2,543	32,029	121,271	11,493	109,778
2100	Beverages	8,887	18,438	3,152	21,590	3,430	9,678	13,108	34,698	3	34,695
2200	Tobacco mfg.	81,739	168,187	50,700	218,887	397	533	930	219,817	175	219,642
2311 2390 2490	Cotton & other textiles	586,961	1,428,129	192,398	1,620,527	27,737	16,613	44,350	1,664,877	310,341	1,354,536
2313	Jute textiles	173,071	369,021	6,871	375,892	41	—	41	375,933	300,311	75,622
2314	Silk & art silk textiles	40,583	80,046	1,346	81,392	37,428	40,703	78,131	159,523	7	159,516
2420	Footwear	29,918	71,404	2,890	74,294	—	165	165	74,459	*n.a.*	74,459
2500 2600	Wood & furniture	6,925	13,318	1,058	14,376	527	2,486	3,013	17,389	277	17,112
2700	Paper mfg.	34,012	82,957	3,341	86,298	36,426	6,840	43,266	129,564	964	128,600

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2800	Printing & publishing	36,942	63,366	—	63,366	7,899	—	7,899	71,265	1,081	70,184
2900	Leather mfg.	32,262	163,755	271	164,026	1,716	131	1,847	165,873	161,045	4,828
3000	Rubber & rubber goods	12,608	25,216	2,327	27,543	37,895	15,738	53,633	81,176	365	80,811
3114	Fertilizer	5,187	18,263	—	18,263	25,326	—	25,326	43,589	9,984	33,605
3150	Soap, perfumes, *etc.*	32,805	91,890	14,015	105,905	5,580	954	6,534	112,439	877	111,562
3191	Matches	28,260	39,414	18,700	58,114	—	—	—	58,114	—	58,114
3199	Chemicals & pharmaceuticals	68,995	135,285	6,720	142,005	209,624	9,440	219,064	361,069	13,909	347,160
3200	Petroleum & coal mfg.	52,405	116,455	44,700	161,155	240,017	90,665	330,682	491,837	17,423	474,441
3300	Non-metallic mineral mfg.	81,713	157,908	7,336	165,244	42,730	3,888	46,618	211,862	935	210,927
3400	Basic metal industries	39,165	100,680	1,125	101,805	257,146	26,385	325,210	580,348	1,234	572,020
3500	Metal products	60,000	152,126	1,207	153,333	41,679				7,094	
3600	Machinery except electric	32,540	70,740	—	70,740	444,604	40,547	485,151	555,891	1,114	554,777
3700	Electric mach. & equip.	28,588	67,745	4,241	71,986	150,420	14,970	165,390	237,376	61	237,315
3800	Transport equip.	45,357	119,047	1,121	120,168	183,155	45,169	228,324	348,492	11,963	336,529
3900	Misc. mfg. ind.	26,504	44,922	1,289	46,211	70,496	6,781	77,277	123,488	30,791	92,697
	Total manufacturing	**1,674,458**	**4,211,419**	**444,585**	**4,656,004**	**1,861,756**	**335,412**	**2,197,168**	**6,853,172**	**921,433**	**5,931,739**
	Consumption goods	1,008,465	2,632,221	365,325	2,997,546	190,977	81,639	292,616	3,270,031	395,031	2,875,131
	Intermediate goods	378,540	910,952	64,230	975,182	551,045	122,814	673,859	1,649,041	504,001	1,145,040
	Investment & related goods	287,453	668,246	15,030	683,276	1,119,734	130,959	1,230,693	1,933,969	22,401	1,911,568

Source: *See* text of Appendix A.

TABLE A-4

SUMMARY STATISTICS BY INDUSTRY: 1963/64

(Current Prices)

No.	Industry name	Gross value added	Gross output at factor cost	Domestic indirect taxes	Output at market price	Imports *c. & f.*	Imports taxes	Import at market price	Total supply at market price	Exports *f.o.b.*	Domestic demand
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		(.....*in thousand rupees*..... ...)									
2070	Sugar mfg.	108,242	383,835	76,400	460,235	1,670	702	2,372	462,607	10,636	451,971
2091	Edible oils	63,747	574,294	43,457	617,751	164,570	6,576	171,146	788,897	17,321	771,576
2092	Tea mfg.	30,986	183,351	31,800	215,151	1,690	1,047	2,737	217,888	22	217,866
2099	Food mfg.	28,981	64,260	17,012	81,272	41,022	10,822	51,844	133,116	14,781	118,335
2100	Beverages	11,647	26,055	13,605	39,660	5,738	14,730	20,468	60,128	145	59,983
2200	Tobacco mfg.	253,168	404,422	105,994	510,416	755	882	1,637	512,053	3,524	508,529
2311, 2390, 2490	Cotton & other textiles	806,138	2,010,320	214,332	2,224,652	45,196	27,529	72,725	2,297,377	249,609	2,047,768
2313	Jute textiles	217,507	517,874	16,446	534,320	—	—	—	534,320	461,480	72,840
2314	Silk & art silk textiles	55,709	105,509	985	106,494	62,722	66,638	129,360	235,854	245	235,609
2450	Footwear	39,920	84,220	3,530	89,750	719	—	719	90,469	19,445	71,024
2500, 2600	Wood & furniture	13,147	20,010	1,769	21,779	17,159	8,973	26,132	47,911	468	47,443
2700	Paper mfg.	70,317	158,730	13,116	171,846	48,010	18,449	66,459	238,305	9,838	228,467

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2800	Printing & publishing	69,589	119,160	—	119,160	12,734	—	12,734	131,894	583	131,311
2900	Leather mfg.	48,432	189,930	660	190,590	3,531	11,900	15,431	206,021	147,442	58,579
3000	Rubber & rubber goods	21,386	42,265	2,702	44,967	77,489	23,818	101,307	146,274	4,835	141,439
3114	Fertilizer	28,280	80,569	—	80,569	26,036	—	26,036	106,605	45,089	61,516
3150	Soap, perfumes, *etc.*	39,540	110,671	24,323	134,994	12,641	5,987	18,628	153,622	14,852	138,770
3191	Matches	33,623	47,490	24,000	71,490	—	—	—	71,490	—	71,490
3199	Chemicals & pharmaceuticals	137,115	261,670	14,869	276,539	358,766	67,053	425,819	702,358	26,800	675,558
3200	Petroleum & coal mfg.	108,383	223,010	241,435	464,445	200,606	112,382	312,988	777,433	7,503	769,930
3300	Non-metallic mineral mfg.	159,267	250,420	43,792	294,212	127,443	24,609	152,052	446,264	5,462	440,812
3400	Basic metal industries	178,392	408,220	12,940	421,160	618,293	168,751	918,539	1,638,364	13,275	1,625,089
3500	Metal products	145,876	291,920	6,745	298,665	131,495					
3600	Machinery except electric	82,167	165,660	—	165,660	807,527	101,621	909,148	1,074,808	8,514	1,066,294
3700	Electric mach. & equip.	95,824	180,460	17,066	197,526	255,457	110,409	365,866	563,392	7,252	556,140
3800	Transport equip.	67,306	207,737	3,179	210,916	478,582	179,217	657,799	868,715	18,133	850,582
3900	Misc. mfg. ind.	79,805	138,310	2,061	140,371	75,041	28,979	104,020	244,391	66,578	177,813
	Total manufacturing	**2,994,494**	**7,252,372**	**932,218**	**8,184,590**	**3,574,892**	**991,074**	**4,565,966**	**12,750,556**	**1,153,822**	**11,596,734**
	Consumption goods	1,634,242	4,273,907	559,268	4,833,175	441,657	172,865	614,522	5,447,697	398,209	5,049,488
	Intermediate goods	631,420	1,474,048	289,228	1,763,276	714,438	233,602	948,040	2,711,316	702,987	2,008,329
	Investment & related goods	728,832	1,504,417	83,722	1,588,139	2,418,797	584,607	3,003,404	4,591,543	52,626	4,538,917

Source: *See* text of Appendix A.

Appendix B

TABLE B-1

DETERMINANTS OF OUTPUT GROWTH: 1954/1955 to 1963/64

No. (1)	Industry name (2)	$\frac{X_1}{Z_1}$ (3)	$\frac{X_3}{Z_3}$ (4)	$\frac{X_3-X_1}{Z_3}$ (5)	$\frac{X_1}{Z_1}(\Delta D+\Delta W)$ (6)	$\frac{X_1}{Z_1}(\Delta E)$ (7)	$\left(\frac{X_3}{Z_3}-\frac{X_1}{Z_1}\right)Z_3$ (8)	ΔX (9)
2070.	Sugar manufacturing	0.497	0.995	0.498	115,205	5,286	230,378	350,747
2091.	Edible oils	0.954	0.783	—0.171	637,552	16,524	—134,901	519,128
2092.	Tea manufacturing	0.977	0.987	0.010	114,976	—39,642	2,179	77,661
2099.	Food, *n.e.c.*	0.725	0.611	—0.114	41,439	10,130	—15,175	36,342
2100.	Beverages	0.712	0.660	—0.052	21,446	101	—3,127	18,400
2200.	Tobacco manufacturing	0.985	0.997	0.012	402,040	3,460	6,145	411,540
2311. 2390. 2490.	Cotton and other textile	0.801	0.968	0.167	929,248	195,030	383,662	1,508,331
2313.	Jute textiles	0.994	1.000	0.006	33,972	409,985	3,206	447,154
2314.	Silk and art silk textiles	0.430	0.452	0.022	63,162	105	5,189	68,353
2420.	Footwear	0.998	0.992	—0.006	30,010	19,406	—543	48,878
2500. 2600.	Wood and furniture	0.345	0.455	0.110	12,819	67	5,270	18,135
2700.	Paper manufacturing	0.494	0.721	0.227	80,912	4,845	54,095	139,855
2800.	Printing and publishing	0.910	0.903	—0.007	82,532	341	—923	81,996
2900.	Leather manufacturing	0.989	0.925	—0.064	52,560	113,810	—13,185	153,203

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3000.	Rubber and rubber goods	0.409	0.307	—0.102	43,172	1,974	—14,920	30,269
3114.	Fertilizer	0.200	0.756	0.556	110,526	7,951	59,272	77,721
3150.	Soap, perfume, *etc.*	0.842	0.879	0.037	91,370	12,486	5,684	109,513
3191.	Matches	0.970	1.000	0.030	34,654	—	2,145	36,820
3199.	Chemical and pharamceuticals, *etc.*	0.293	0.394	0.101	160,478	6,688	70,938	237,854
3200.	Petroleum and coal products	0.349	0.597	0.248	173,327	—985	192,803	365,382
3300.	Non-metallic minerals	0.806	0.659	—0.147	287,172	4,050	—65,601	225,768
3408. 3500.	Basic metal industry Metal products	0.440	0.440	—	609,565	5,026	—	613,571
3600.	Machinery	0.064	0.154	0.090	51,245	468	96,733	148,701
3700.	Electric machinery and equipment	0.203	0.351	0.148	99,014	1,439	83,382	183,588
3800.	Transport equipment	0.140	0.243	0.103	100,616	2,372	89,478	192,252
3900.	Miscellaneous manufacturing	0.342	0.574	0.232	43,019	20,785	56,699	120,570
	Total manufacturing				**4,322,031**	**801,702**	**1,098,883**	**6,221,732**
	Industries primarily producing							
	Consumption goods				2,619,472	244,079	542,682	3,406,414
	Intermediate goods				554,947	544,268	352,209	1,451,438
	Investment and related goods				1,147,612	13,355	203,992	1,363,880

Source: Computed from Appendix Tables A-2 and A-4.

TABLE B-2

DETERMINANTS OF OUTPUT GROWTH: 1954/1955 to 1959/60

INDUSTRY No. (1)	Name (2)	$\frac{X_1}{Z_1}$ (3)	$\frac{X_2}{Z_2}$ (4)	$\frac{X_2}{Z_2} - \frac{X_1}{Z_1}$ (5)	$\frac{X_1}{Z_1}(\Delta D + \Delta W)$ (6)	$\frac{X_1}{Z_1}\Delta E$ (7)	$\left(\frac{X_2}{Z_2} - \frac{X_1}{Z_1}\right)Z_2$ (8)	ΔX (9)
2070.	Sugar manufacturing	0.497	0.999	0.502	—4,806	2,235	107,928	105,482
2091.	Edible oils	0.954	0.966	0.012	131,580	—	2,894	134,414
2092.	Tea manufacturing	0.977	0.994	0.017	20,464	—4,990	2,663	18,145
2099.	Food, *n.e.c.*	0.725	0.736	0.011	35,235	7,746	1,334	44,312
2100.	Beverages	0.712	0.622	—0.090	3,441	—	—3,123	330
2200.	Tobacco manufacturing	0.985	0.996	0.011	117,486	162	2,418	120,011
2311., 2390., 2490.	Cotton and other textile	0.801	0.973	0.172	373,969	243,676	286,359	904,206
2313.	Jute textiles	0.994	0.999	0.005	36,737	249,783	1,880	288,726
2314.	Silk and art silk textiles	0.430	0.510	0.080	30,442	3	12,762	43,251
2420.	Footwear	0.998	0.998	—	33,505	—	—	33,422
2500., 2600.	Wood and furniture	0.345	0.827	0.482	2,355	1	8,381	10,732
2700.	Paper manufacturing	0.494	0.666	0.172	31,577	461	22,285	54,307
2800.	Printing and publishing	0.910	0.889	—0.021	26,907	794	—1,497	26,202
2900.	Leather manufacturing	0.989	0.989	—	—599	127,264	—	126,639
3000.	Rubber and rubber goods	0.409	0.339	—0.070	18,375	146	—5,682	12,845
3114.	Fertilizer	0.200	0.419	0.219	4,244	930	9,546	15,415

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3150.	Soap, perfume, *etc.*	0.842	0.942	0.100	68,461	719	11,244	80,424
3191.	Matches	0.970	1.000	0.030	21,680	—	1,743	23,444
3199.	Chemicals and pharmaceuticals	0.293	0.393	0.100	64,258	2,911	36,107	103,320
3200.	Petroleum and coal products	0.349	0.328	—0.021	70,192	2,477	—10,329	62,092
3300.	Non-metallic minerals	0.806	0.780	—0.026	101,885	409	—5,508	96,800
3400. 3500.	Basic metal industries; Metal products	0.440	0.440	—	146,214	2,849	—	148,884
3600.	Machinery	0.064	0.127	0.063	18,508	—6	35,021	53,781
3700.	Electric machinery and equipment	0.203	0.303	0.100	34,293	—20	23,738	58,048
3800.	Transport equipment	0.104	0.345	0.205	28,649	1,509	71,441	101,504
3900.	Miscellaneous manufacturing	0.342	0.377	0.035	13,910	8,546	4,322	26,410
	Total manufacturing				**1,429,662**	**647,605**	**615,927**	**2,693,146**
	Industries primarily producing							
	Consumption goods				874,629	258,892	437,428	1,570,785
	Intermediate goods				225,484	383,972	53,807	663,344
	Investment and related goods				329,549	4,741	124,692	459,017

Source: Computed from Appendix Tables A-2 and A-3.

TABLE B-3

DETERMINANTS OF OUTPUT GROWTH: 1959/60 to 1963/64

INDUSTRY		$\frac{X_2}{Z_2}$	$\frac{X_3}{Z_3}$	$\frac{X_3}{Z_3} - \frac{X_2}{Z_2}$	$\frac{X_2}{Z_2}(\Delta D + \Delta W)$	$\frac{X_2}{Z_2}\Delta E$	$\left(\frac{X_3}{Z_3} - \frac{X_2}{Z_2}\right)Z_3$	ΔX
No. (1)	Name (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2070.	Sugar manufacturing	0.999	0.995	—0.006	241,230	6,134	—1,850	245,265
2091.	Edible oils	0.966	0.783	—0.183	512,336	16,732	—144,368	384,714
2092.	Tea manufacturing	0.994	0.987	—0.007	96,157	—35,255	—1,525	59,516
2099.	Food manufacturing, *n.e.c.*	0.738	0.611	—0.125	6,298	2,420	—16,640	—7,970
2100.	Beverages	0.622	0.660	0.038	15,729	88	2,285	18,070
2200.	Tobacco manufacturing	0.996	0.997	0.001	287,731	3,336	512	291,529
2311. 2390. 2490.	Cotton and other textiles	0.973	0.968	—0.005	674,515	—59,092	—11,487	604,125
2313.	Jute textiles	0.999	1.000	0.001	—2,779	161,008	534	158,428
2314.	Silk and art silk textiles	0.510	0.452	—0.058	38,807	121	—13,680	25,102
2420.	Footwear	0.998	0.992	—0.006	—3,428	19,406	—543	15,456
2500. 2600.	Wood and furniture	0.827	0.455	—0.372	25,084	158	—17,823	7,403
2700.	Paper manufacturing	0.666	0.721	0.055	66,511	5,910	13,017	85,548
2800.	Printing and publishing	0.889	0.903	0.014	54,342	—443	1,847	55,794
2900.	Leather manufacturing	0.989	0.925	—0.064	53,160	—13,453	—13,185	26,564
3000.	Rubber and rubber goods	0.339	0.307	—0.032	20,553	1,515	—4,681	17,424
3114.	Fertilizer	0.419	0.756	0.337	11,695	14,709	35,926	62,306

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3150.	Soap, perfume, *etc.*	0.942	0.879	0.063	25,630	13,164	—9,678	29,089
3191.	Matches	1.000	1.000	—	13,376	—	—	13,376
3199.	Chemicals and pharmaceuticals	0.393	0.394	0.001	129,060	5,066	702	134,534
3200.	Petroleum and coal products	0.328	0.597	0.269	96,929	—3,250	209,129	303,290
3300.	Non-metallic minerals	0.780	0.659	—0.121	179,310	3,523	—53,998	128,968
3400. 3500.	Basic metal industries Metal products	0.440	0.440	—	463,350	2,177	—	464,687
3600.	Machinery	0.127	0.154	0.027	64,963	940	29,020	94,920
3700.	Electrical machinery and equipment	0.303	0.351	0.048	96,604	2,179	27,043	125,540
3800.	Transport equipment	0.345	0.243	—0.102	177,348	2,129	—88,609	90,748
3900.	Miscellaneous manufacturing	0.374	0.574	0.200	31,833	13,384	48,878	94,160
	Total manufacturing				**3,376,344**	**162,606**	**—9,084**	**3,528,586**
	Industries primarily producing							
	Consumption goods				2,019,640	—19,647	—164,072	1,835,629
	Intermediate goods				375,129	171,505	241,532	788,094
	Investment and related goods				981,575	10,948	—86,544	904,863

Source: Computed from Appendix Tables A-3 and A-4.

Appendix C

TABLE C-1

SOURCES OF CHANGE IN VALUE ADDED: 1954/55 to 1963/64

INDUSTRY		r_1	r_3	$r_3 - r_1$	$r_1\left[\frac{X_1}{Z_1}(\Delta D + \Delta W)\right]$	$r_1\left[\frac{X_1}{Z_1}\Delta E\right]$	$r_1\left[\left(\frac{X_3}{Z_3} - \frac{X_1}{Z_1}\right)(Z_3)\right]$	$(r_3 - r_1)X_3$	ΔV
No. (1)	Name (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2070.	Sugar manufacturing	0.287	0.235	—0.052	33,064	1,517	66,118	—23,932	76,822
2091.	Edible oils	0.120	0.103	—0.017	76,506	1,983	—16,188	—10,502	51,949
2092.	Tea manufacturing	0.042	0.144	0.102	4,829	—1,665	92	21,945	25,226
2099.	Food, *n.e.c.*	0.194	0.357	0.163	8,039	1,965	—2,944	13,247	20,249
2100.	Beverages	0.407	0.294	—0.113	8,729	41	—1,273	—4,482	3,002
2200.	Tobacco manufacturing	0.370	0.946	0.126	148,755	1,280	2,274	64,312	216,631
2311. 2390. 2490.	Cotton and other textiles	0.404	0.362	—0.042	375,416	78,792	154,999	93,435	516,811
2313.	Jute textiles	0.440	0.407	—0.033	14,948	180,393	1,411	—17,633	179,163
2314.	Silk and art silk textiles	0.505	0.523	0.018	31,897	53	2,620	1,917	36,459
2420.	Footwear	0.456	—0.445	0.012	13,685	8,849	—248	—1,077	21,267
2500. 2600.	Wood and furniture	0.343	0.604	0.261	4,397	23	1,808	5,684	11,896
2700.	Paper manufacturing	0.400	0.409	0.009	32,365	1,938	21,638	1,547	57,506

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2800.	Printing and publishing	0.558	0.584	0.026	46,053	190	—515	3,098	48,851
2900.	Leather manufacturing	0.301	0.254	—0.047	15,821	34,257	—3,969	—8,958	37,178
3000.	Rubber and rubber goods	0.370	0.476	0.106	15,974	730	—5,520	4,766	15,994
3114.	Fertilizer	0.231	0.351	0.120	2,431	1,837	13,692	9,668	27,622
3150.	Soap, perfume, *etc.*	0.333	0.293	—0.040	30,426	4,158	1,893	—5,400	31,031
3191.	Matches	0.544	0.470	—0.074	18,852	—	1,167	—5,290	14,771
3199.	Chemicals and pharmaceuticals	0.417	0.496	0.079	66,919	2,789	29,581	21,847	120,970
3200.	Petroleum and coal manufacturing	0.314	0.233	—0.081	54,425	309	60,540	—37,620	77,228
3300.	Non-metallic minerals	0.424	0.541	0.117	121,761	1,717	—27,815	34,423	130,211
3400. 3500.	Basic metal industry Metal products.	0.308	0.450	0.142	187,746	1,548	—	102,215	291,539
3600.	Machinery	0.441	0.496	0.055	22,599	427	42,659	9,111	74,688
3700.	Electric machinery and equipment	0.402	0.485	0.083	39,804	578	33,520	16,395	90,217
3800.	Transport equipment	0.458	—0.319	1.139	46,082	1,086	40,981	—29,317	58,763
3900.	Miscellaneous manufacturing	0.543	0.569	0.026	23,359	11,286	30,788	3,650	69,062
	Total manufacturing				**1,444,882**	**336,081**	**447,309**	**76,179**	**2,305,056**
	Industries producing primarily								
	Consumption goods				824,007	108,472	240,591	—30,265	1,144,027
	Intermediate goods				202,883	222,253	117,373	—26,383	515,611
	Investment and related goods				417,992	5,356	89,345	132,827	645,418

Source: Computed from Appendix Tables A-2, A-4 and B-1.

TABLE C-2

SOURCE OF CHANGE IN VALUE ADDED: 1954/55 to 1959/60

No. (1)	Name (2)	r_1 (3)	r_2 (4)	$r_2 - r_1$ (5)	$r_1\left[\left(\frac{X_1}{Z_1}\right)(\Delta D + \Delta W)\right]$ (6)	$r_1\left[\frac{X_1}{Z_1}(\Delta E)\right]$ (7)	$r_1\left[\left(\frac{X_2}{Z_2} - \frac{X_1}{Z_1}\right)Z_2\right]$ (8)	$(r_2 - r_1)X_2$ (9)	ΔV (10)
2070.	Sugar manufacturing	0.287	0.279	—0.008	—1,379	641	30,975	—1,720	28,578
2091.	Edible oils	0.120	0.122	0.002	15,790	—	347	466	10,524
2092.	Tea manufacturing	0.042	0.120	0.078	859	—210	112	12,140	12,880
2099.	Food, n.e.c.	0.194	0.246	0.052	6,836	1,503	259	4,641	13,249
2100.	Beverage	0.407	0.412	0.005	1,400	—	—1,271	108	242
2200.	Tobacco manufacturing	0.370	0.373	0.003	43,470	60	895	657	45,202
2311. 2390. 2490.	Cotton and other textiles	0.404	0.362	—0.042	151,084	98,445	115,689	—68,062	297,634
2313.	Jute textiles	0.440	0.460	0.020	16,164	109,905	827	7,518	134,727
2314.	Silk and art silk textiles	0.505	0.499	—0.006	15,373	2	6,445	—488	21,333
2420.	Footwear	0.456	0.403	—0.053	15,278	—	—	—3,938	11,265
2500. 2600.	Wood and furniture	0.343	0.482	0.139	808	—	2,875	1,998	5,674

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2700.	Paper manufacturing	0.400	0.394	—0.006	12,631	184	8,914	—518	21,204
2800.	Printing and publishing	0.558	0.583	0.025	15,014	443	—835	1,584	16,204
2900.	Leather manufacturing	0.301	0.197	—0.104	—180	38,306	—	17,054	21,008
3000.	Rubber and rubber goods	0.370	0.458	0.088	6,799	54	—2,102	2,424	7,166
3114.	Fertilizer	0.231	0.284	0.053	1,142	215	2,205	968	4,529
3150.	Soap, perfume, *etc.*	0.333	0.310	—0.023	22,797	239	3,774	—2,436	24,326
3191.	Matches	0.544	0.486	—0.058	11,794	—	948	—3,371	9,401
3199.	Chemicals and pharmaceuticals	0.417	0.480	0.069	26,796	1,214	15,057	9,798	52,877
3200.	Petroleum and coal manufacturing	0.314	0.325	0.011	22,040	778	—3,243	1,773	21,250
3300.	Non-metallic minerals	0.424	0.494	0.070	43,199	173	—2,335	11,567	52,657
3400. 3500.	Basic metal industry	0.308	0.389	0.081	45,034	877	—	20,666	66,526
3600.	Machinery	0.441	0.460	0.019	8,162	—3	15,444	1,344	25,061
3700.	Electric machinery	0.402	0.397	—0.005	13,786	—8	9,543	—360	22,981
3800.	Transport equipment	0.458	0.377	—0.081	13,121	691	32,720	—9,734	36,814
3900.	Miscellaneous manufacturing	0.543	0.573	0.030	7,553	4,640	2,347	1,386	15,761
	Total manufacturing				**515,371**	**258,369**	**239,560**	**—28,648**	**985,079**
	Industries producing primarily:								
	Consumption goods				306,677	105,983	162,530	—57,035	518,282
	Intermediate goods				85,392	150,656	21,658	4,904	262,758
	Investment and related goods				123,302	1,730	55,372	23,483	204,039

Source: Computed from Appendix Tables A-2, A-3 and B-2.

TABLE C-3

SOURCES OF CHANGE IN VALUE ADDED : 1959/60 to 1963/64

INDUSTRY		r_2	r_3	$r_3 - r_2$	$r_2\left[\left(\frac{X_2}{Z_2}\right)(\Delta D + \Delta W)\right]$	$r_2\left[\left(\frac{X_2}{Z_2}\right)\Delta E\right]$	$r_2\left[\left(\frac{X_3}{Z_3} - \frac{X_2}{Z_2}\right)Z_3\right]$	$\left(r_3 - r_2\right)X_3$	ΔV
No.	Name								
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2070.	Sugar manufacturing	0.279	0.235	—0.044	67,303	1,711	—516	—20,250	48,244
2091.	Edibles	0.122	0.103	—0.019	62,505	2,041	—17,613	—11,737	35,425
2092.	Tea manufacturing	0.120	0.144	8.024	11,539	—4,231	—183	5,164	12,346
2099.	Food manufacturing, *n.e.c.*	0.246	0.357	8.111	1,549	595	—4,093	9,021	7,000
2100.	Beverages	0.412	0.294	—0.118	6,480	36	941	—4,680	2,760
2200.	Tobacco manufacturing	0.373	0.496	0.123	107,324	1,244	191	62,781	171,429
2311. 2390. 2490.	Cotton and other textiles	0.362	0.362	0.000	244,174	—21,391	—4,158	—	219,177
2313.	Jute textiles	0.460	0.407	—0.053	—1,278	74,064	246	—28,319	44,436
2314.	Silk, art silk textiles, *etc.*	0.499	0.523	0.024	19,365	60	—6,826	2,556	15,126
2420.	Footwear	0.403	0.445	0.042	—1,381	7,821	—219	3,770	10,002

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2500. 2600.	Wood furniture	0.482	0.604	0.122	12,090	76	—8,591	2,657	6,222
2700.	Paper manufacturing	0.394	0.409	0.015	26,205	2,329	5,164	2,578	36,305
2800.	Printing and publishing	0.583	0.584	0.001	31,681	—258	1,077	119	32,647
2900.	Leather manufacturing	0.197	0.254	0.057	10,473	—2,650	—2,597	10,864	16,170
3000.	Rubber, rubber goods	0.458	0.476	0.018	9,413	694	—2,144	809	8,778
3114.	Fertilizer	0.284	0.351	0.067	3,321	4,177	10,203	5,398	23,093
3150.	Soap, perfumes, *etc.*	0.310	0.293	—0.017	7,945	4,081	—3,000	—2,295	6,705
3191.	Matches	0.486	0.470	—0.016	6,501	—	—	—1,144	5,361
3199.	Chemicals, pharmaceuticals	0.486	0.496	0.010	62,723	2,462	341	2,765	68,093
3200.	Petroleum and coal manufacturing	0.325	0.233	—0.092	31,502	—1,056	67,967	—42,729	55,978
3300.	Non-metallic minerals	0.494	0.541	0.407	88,579	1,740	—26,675	13,828	77,554
3400. 3500.	Basic metal industry Metal products	0.389	0.450	0.061	180,243	847	—	43,909	225,013
3600.	Machinery	0.460	0.496	0.036	29,883	432	13,349	5,964	49,627
3700.	Electric machinery and equipment	0.397	0.485	0.088	38,352	865	10,736	17,382	67,236
3800.	Transport equipment	0.377	0.319	—0.058	66,860	803	—33,406	—12,233	21,949
3900.	Miscellaneous manufacturing	0.573	0.569	—0.004	18,240	7,669	28,007	—561	53,301
	Total				**1,141,591**	**84,161**	**28,201**	**65,617**	**1,319,977**
	Industries producing primarily								
	Consumption goods				595,315	—546	—14,983	45,401	625,745
	Intermediate goods				142,359	80,020	79,180	—48,634	252,853
	Investment and related goods				403,917	4,687	—35,996	68,850	441,379

Source: Computed from Appendix Tables A-3, A-4 and B-3