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### 3.1 Introduction

THE PURPOSE OF THIS STUDY is to analyse the sources of output and labour productivity growth in the Canadian economy since 1961. The study also considers the sources of output growth in individual industries. We adopt the constant quality indices of capital and labour inputs introduced by Jorgenson and Griliches (1967), and later used extensively in Jorgenson (1995a, 1995b), Jorgenson, Gollop, and Fraumeni (1987), and Jorgenson and Yip (1999) to identify the sources of growth. This framework is similar to the one employed by the U.S. Bureau of Labor Statistics, but some minor differences still remain between the two.<sup>1</sup> At the industry level, we adjust for capital quality by aggregating capital stocks across different asset types, using the share of property income as the weight for each type. At the same time, we combine hours worked by each type of worker using its share of labour compensation to reflect labour quality. At the aggregate level, we apply the same framework by aggregating capital stocks across different asset types and hours worked across different types of workers. A number of studies have compared Canada's aggregate economic growth performance with that of its competitors based on this framework (Dougherty, 1992; Dougherty and Jorgenson, 1997; and Jorgenson and Yip, 1999). However, this is the first study where this framework is used to assess Canada's economic performance at the industry level.

Output growth in Canada's private business sector decreased from an average of 5.6 percent per year during the period 1961-73 to 3.3 percent during 1973-88 and 1.5 percent during 1988-95. The health and strength of the private business sector are directly related to the overall performance of Canada's gross domestic product (GDP) per capita. Growth in GDP per capita also slowed down over the entire period — from 3.6 percent per year during 1961-73 to 2.1 percent during 1973-88, and to a mere 0.3 percent during 1988-95. Based on our findings, about 46 percent of the private business sector's output growth over 1961-73, and 22 percent and 26 percent, respectively, over 1973-88 and 1988-95, are attributable to growth in quality-adjusted TFP. Over 80 percent of the slowdown in output growth between 1961-73 and 1973-88 is attributable

to the slowdown in TFP growth; over the following interval (1973-88 to 1988-95), more than 80 percent of the slowdown in output growth is attributable to slower capital and labour input growth.

For most of the 122 industries examined in this study, input growth was a predominant source of output growth during 1961-73 and 1973-88. In the last period (1988-95), however, TFP growth accounted for more than 50 percent of output growth in slightly more than half of Canadian industries. This is due to the fact that, in 80 industries, the slowdown in input growth between 1973-88 and 1988-95 was greater than that of TFP growth.

In the next section, we briefly describe the methodology used, while in Section 3.3 we describe the data set. In Section 3.4, we analyse the sources of growth at the level of individual industries, and in Section 3.5 we present our findings for the private business sector. Section 3.6 outlines our conclusions.

### 3.2 Methodology

TO ANALYSE THE SOURCES OF GROWTH in the Canadian private business sector, we adopt the methodology described in Jorgenson, Gollop, and Fraumeni (1987), where the output  $\{Q_{it}\}$  of each industry  $i$  is a function of capital inputs  $\{K_{it}\}$ , labour inputs  $\{L_{it}\}$ , intermediate inputs  $\{M_{it}\}$ , and time,  $t$ .

$$(1) \quad Q_{it} = F(K_{it}, L_{it}, M_{it}, t).$$

Assuming constant returns to scale with a translog production function (see Christensen, Jorgenson, and Lau, 1973), the growth rate of output can be expressed as a weighted average of the growth rates of capital, labour, and intermediate inputs plus the average rate of productivity growth, or total factor productivity (TFP) growth  $\{\bar{v}_{it}\}$ :

$$(2) \quad \ln Q_{it} - \ln Q_{it-1} = \bar{v}_{it}^K [\ln K_{it} - \ln K_{it-1}] + \bar{v}_{it}^L [\ln L_{it} - \ln L_{it-1}] \\ + \bar{v}_{it}^M [\ln M_{it} - \ln M_{it-1}] + \bar{v}_{it}.$$

Weights are defined by the average shares of each component:

$$(3) \quad \bar{v}_{it}^K = \frac{1}{2}[v_{it}^K + v_{it-1}^K], \quad \bar{v}_{it}^L = \frac{1}{2}[v_{it}^L + v_{it-1}^L],$$

$$\bar{v}_{it}^M = \frac{1}{2}[v_{it}^M + v_{it-1}^M], \quad \bar{v}_{it} = \frac{1}{2}[v_{it} + v_{it-1}],$$

where,  $v_{it} = \partial \ln Q_{it} / \partial t(K_{it}, L_{it}, M_{it}, t)$ .

The shares of each component are given as:

$$(4) \quad v_{it}^K = \frac{P_{it}^K K_{it}}{P_{it} Q_{it}}, \quad v_{it}^L = \frac{P_{it}^L L_{it}}{P_{it} Q_{it}}, \quad v_{it}^M = \frac{P_{it}^M M_{it}}{P_{it} Q_{it}},$$

where  $\{P_{it}\}$ ,  $\{P_{it}^K\}$ ,  $\{P_{it}^L\}$ , and  $\{P_{it}^M\}$  denote the prices of output and of capital, labour, and intermediate inputs, respectively.

We also assume that each sector's input (capital, labour, and intermediate inputs) is a translog function of its components and that each differs in its marginal productivity. We can express the growth rate of each input as the weighted average of the growth rates of individual components:

$$(5) \quad \ln X_{it}^i - \ln X_{it-1}^i = \sum_{j=1}^m \bar{v}_{jt}^{Xi} [\ln X_{jt}^i - \ln X_{jt-1}^i], \quad X = \{K, L, M\},$$

where the weights are provided by the average shares of each component:

$$(6) \quad \bar{v}_{jt}^{Xi} = \frac{1}{2}[v_{jt}^{Xi} + v_{jt-1}^{Xi}], \quad (j = 1, 2, \dots, m), \quad X = \{K, L, M\},$$

and the shares of each component are defined as:

$$(7) \quad v_{jt}^{Xi} = \frac{P_{jt}^{Xi} X_{jt}^i}{\sum_{j=1}^m P_{jt}^{Xi} X_{jt}^i}, \quad (j = 1, 2, \dots, m), \quad X = \{K, L, M\}.$$

Note that the number of components,  $m$ , varies for each type of input,  $X$ .

In our analysis, we explicitly consider the quality components of capital and labour inputs for each industry. The above equations enable us to construct both quality and quantity indices for capital and labour inputs. The quality component can be measured as the ratio of the capital input,  $K_{it}$ , to the preceding period's capital stock,  $A_{it-1}$ :

$$(8) \quad q_{it}^K = K_{it} / A_{it-1}.$$

Thus,  $q_{it}^K$  is expressed as:

$$(9) \quad \ln q_{it}^K - \ln q_{it-1}^K = \sum_{j=1}^p \bar{v}_{jt}^{Kj} [\ln A_{jt-1}^i - \ln A_{jt-2}^i] - [\ln A_{it-1} - \ln A_{it-2}],$$

where  $A_i$  is an unweighted sum of different types of capital stock. The index therefore reflects changes in the composition of capital.

Similarly, the quality of the labour input can be defined as the ratio of the labour input,  $L_{it}$ , to hours worked,  $H_{it}$ :

$$(10) \quad q_{it}^L = L_{it} / H_{it}.$$

Here, the quality index of the labour input is expressed as:

$$(11) \quad \ln q_{it}^L - \ln q_{it-1}^L = \sum_{j=1}^l \bar{v}_{jt}^{Lj} [\ln H_{jt}^i - \ln H_{jt-1}^i] - [\ln H_{it} - \ln H_{it-1}],$$

where  $H_i$  is an unweighted sum of its components.

### 3.3 Data

WE CONSTRUCT BOTH OUTPUT AND INPUT DATA for 122 industries (listed in Table 3.A1, in the Annex to this chapter) covering the period 1961 to 1995. Both prices and quantities of gross output and intermediate input (energy, materials, and services) are taken from Statistics Canada's KLEMS database.<sup>2</sup>

### 3.3.1 Capital Input Data

The prices and quantities of capital inputs are aggregated from five asset types — machinery and equipment, non-residential structures, engineering structures, inventories, and land — for the 122 industries. For depreciable assets (including machinery and equipment, building structures, and engineering structures), we use capital stock estimates from Statistics Canada's KLEMS database which uses a modified double-declining-balance rate (Statistics Canada, 1994a).<sup>3</sup> We then estimate inventory stocks and land using Statistics Canada data as explained below.

Our estimates of inventory stocks are mainly based on national and industry balance sheet data. We first estimate inventory stocks at current prices for the 122 industries, using industry balance sheet data and the Input-Output tables. For the period 1972-87, inventory stocks at current prices are set as the book value of inventory stocks from balance sheet data at the detailed level of industry aggregation (the three-digit 1970 Standard Industrial Classification). For the periods 1961-71 and 1988-95, net inventory investment at current prices is estimated from the Input-Output tables on inventory changes in finished goods and goods in progress, and in raw materials and goods purchased for resale. To obtain inventory stocks and inventory investment at constant prices, nominal inventory stocks and inventory investment are deflated by the average of the price deflators of raw materials and final output. The data on inventory stocks for the period 1972-87 are extrapolated to the periods 1961-71 and 1988-95 on the basis of the estimated net inventory investment data. Our final estimates of inventory stocks in current and constant dollars are all adjusted to national totals from the national balance sheet.

To estimate land input by industry, we first obtain estimates of total land in current dollars from 1961 to 1995 from the National Balance Sheet Accounts. We assume that the quantity of land remains constant and derive its price index. We then remove the real value of farm, residential, and government land from the real value of total land. The remaining non-agricultural, non-government land is allocated across 121 industries. For 1972-87, the allocation is based on Statistics Canada's Detailed Balance Sheet and Income and Earnings Statistics. The land estimates are then extrapolated based on the growth in the stock of non-residential structures by industry for the periods 1961-71 and 1987-95, always adjusting to the national total.

We then estimate the prices of capital services for five assets, based on property compensation data. Following Jorgenson and Yun (1991), we use the following expression to construct the rental price of depreciable assets for each industry  $i$ :<sup>4</sup>

$$(12) \quad P_j^{Ki} = \frac{1 - e_j^i - tz_j^i}{1 - t} P_j^{ii} \left[ (r_j - \pi_j^i) + (1 + \pi_j^i) \delta_j^i \right] + t_j^{pi} P_j^{ii},$$

where:  $t$  is the combined federal and provincial corporate income tax rate;  $e_j^i$  is the rate of the investment tax credit;  $z_j^i$  is the present value of capital cost allowances on one dollar's worth of investment;<sup>5</sup>  $P_j^{ii}$  is the price of new investment good  $j$ ;  $r_j$  is the nominal rate of return on asset type  $j$ ;  $\pi_j^i = (P_j^{ii} - P_{j-1}^{ii}) / P_{j-1}^{ii}$  is the capital gain for asset  $j$ ;  $\delta_j^i$  is the depreciation rate for asset  $j$ ; and  $t_j^{pi}$  is the property tax rate.

We use the following expression for the rental price of land and inventories since there is no investment tax credit, capital consumption allowance or economic depreciation:

$$(13) \quad P_j^{Ki} = \left[ \frac{r_j - \pi_j^i}{1 - t} + t_j^{pi} \right] P_j^{ii}.$$

We take into account the following three features of the corporate tax system in the calculation of rental prices: both federal and provincial corporate tax rates, small business tax deductions for Canadian-controlled private corporations, and tax credit provisions for manufacturing and processing.

To account for these features of the corporate tax system, we use the following data from Statistics Canada's industry balance sheet and income statement figures: the distribution of taxable income across ten provinces by industry for the periods 1961-87 and 1993-95, and total taxable income and small business deductions by industry for the period 1974-94. We then calculate average statutory corporate tax rates for each industry over the period 1961-95, using appropriate taxable income shares as weights. The income share weights are estimated for those years in which data are missing. For example, to estimate the shares of small business deductions in total taxable income over the period 1961-73, we assume that these shares were the same as in 1974. In 1976, to encourage investment, a credit was granted for new production facilities. Initially set at 5 percent for all industries, the rate

was raised to 7 percent in 1979; regional variations with higher rates were also introduced. In 1989, the investment tax credits were discontinued, except in the Atlantic provinces.

Business property taxes in the rental price equations described above are levied mainly on land, engineering structures, and building structures, with machinery being exempt. To estimate property tax rates, we first obtain as the property tax base the nominal values of land and engineering and building structures for the 122 industries. We then divide the tax base into total taxes on production from the Input-Output tables to obtain the average property tax rates.

We determine the rates of return on assets by assuming that the nominal rate of return is the same for all assets (including land and inventories) within a given industry. We also assume that the sum of the values of capital services over all assets is equal to total capital compensation. We can then estimate the nominal rate of return on all assets within a given industry, and ultimately the rental price of capital for all assets within the industry.

Finally, we combine the price and quantity data on capital to construct an index of capital input, as explained in Section 3.2.

### 3.3.2 Labour Input Data

We construct labour input indices from the data on hours worked and labour compensation of workers, broken down by sex, employment status (three categories), age (seven categories), and education (four levels) in each industry, as shown in Table 3.1.<sup>6</sup>

We use various data sources to generate annual estimates of hours worked and labour compensation for 168 components of the workforce in each of the 122 industries. First, we obtain benchmark estimates of hours worked, compensation per hour, and total compensation for the census reference years (the year prior to the census)<sup>7</sup> from the population censuses of 1961, 1971, 1981, 1986, 1991, and 1996. Annual data on hours worked from the monthly Labour Force Survey (LFS) are used to estimate matrices of hours worked for the years between the census benchmarks. We then employ annual data on labour compensation from the Survey of Consumer Finance (SCF) to estimate compensation matrices between two successive censuses. For this purpose, we rely on the method of iterative proportional fitting (for details, see

Jorgenson, Gollop, and Fraumeni, 1987). A weighted average of two neighbouring benchmark matrices is used to initialize our method of proportional fitting. Data from the LFS and the SCF on hours worked and compensation by worker characteristics are used to control for the distribution of hours worked and labour compensation. All matrices of hours worked and labour compensation are then controlled to industry totals on hours worked and compensation by class of employment from Statistics Canada's labour productivity database.

<b>Table 3.1</b>		
<b>Classification of the Canadian Workforce</b>		
<b>Worker Characteristics</b>	<b>Number of Categories</b>	<b>Type</b>
Sex	2	Female; Male
Employment Status	3	Paid Employees; Self-employed; Unpaid Family Workers
Age	7	15-17; 18-24; 25-34; 35-44; 45-54; 55-64; 65+
Education	4	0-8 Years Grade School; Some or Completed High School; Some or Completed Post-Secondary School; University or Higher

We then combine the data on labour compensation per hour and on hours worked to construct an index of labour input, as described in Section 3.2.

### 3.4 Sectoral Output and TFP Growth

IN THIS SECTION, WE EXAMINE OUTPUT GROWTH in the 122 industries over the three periods 1961-73, 1973-88, and 1988-95. We then analyse growth in TFP, capital inputs, labour inputs, and intermediate inputs. Finally, the quality of capital and labour inputs is also discussed.



### 3.4.1 Growth in Output and TFP

Based on the framework introduced in Section 3.2, we can decompose the rate of output growth into the contributions of input and TFP growth. Note that in this paper total factor productivity refers to quality-adjusted TFP. We first compare output and TFP growth rates by industry for the three periods, as shown in Annex Table 3.A2. In a typical industry, growth in both output and TFP slowed down during the three periods. Output growth averaged 6.3 percent per year across 122 industries over 1961-73. That figure declined to 2.7 percent during 1973-88 and to 0.5 percent during 1988-95. TFP growth also slowed down — from 1.4 percent annually during 1961-73 to 0.6 percent over 1973-88 and 0.3 percent over 1988-95.

Table 3.2 summarizes the patterns of output and TFP growth by period. Output growth is negative for 1, 18, and 52 industries, respectively, over 1961-73, 1973-88, and 1988-95. While no industry suffered negative output growth over the entire period, 12 industries did so in the last two periods — other metal mines, iron mines, asbestos mines, distillery products, tobacco products, leather products, copper, wire products, small electrical appliances, major appliances, clay products, and hydraulic cement. At the same time, the number of industries with output growth exceeding 4 percent per year decreased from 97 to 35, and to 14 industries, respectively, over the three successive periods. Only 9 industries experienced growth in output at rates exceeding 4 percent in all three periods — vegetable oil mills, machine shops, motor vehicles, motor parts, communication equipment, office machines, plastics and synthetics, telecommunication carriers, and professional services. Thus the period 1961-73 stands out as one of expansion while the period 1988-95 is identified as one of widespread slowdown in output growth.

The slowdown in TFP growth also became more widespread over the course of the three periods. The number of industries experiencing negative TFP growth rose from 19 over 1961-73 to 37 over 1973-88, and to 51 over 1988-95. However, only 2 industries (urban transit systems and motion pictures) had negative TFP growth in all three periods, while 13 industries had negative TFP growth in the last two periods (including the biscuit, bread, and bakery industry, the sash, door, and other millwork industries, railroads, hydraulic cement, ready-mix concrete, storage, and broadcasting). Moreover, the number of industries with annual TFP growth rates in excess of 2 percent declined from 34 during 1961-73 to 14 in each of the two subsequent periods. Therefore, the number of industries that experienced negative output and TFP growth

increased over the three periods. The number of industries enjoying relatively strong growth (higher than 2 percent per year) also declined over the three periods for output and over the first two periods for TFP.

Growth Rate	Number of Industries					
	Output			TFP		
	1961-73	1973-88	1988-95	1961-73	1973-88	1988-95
< -2%	1	2	29	0	3	8
-2% to 0%	0	16	23	19	34	43
0% to 2%	6	36	34	69	71	57
2% to 4%	18	33	22	29	12	14
4% to 6%	39	23	6	3	1	0
> 6%	58	12	8	2	1	0

Although the slowdown in both output and TFP growth became widespread over the three periods, some industries did expand. In particular, 19 industries saw their output grow faster during 1973-88 than during 1961-73; similarly, 24 industries experienced faster output growth over 1988-95 than over 1973-88. However, only the vegetable oil and office machine industries posted faster output growth in both 1973-88 and 1988-95 relative to the immediately preceding period. On the TFP side, 40 industries experienced faster growth in the second period compared to the first, and 54 industries posted higher growth in the last period compared to the second. Seven industries posted faster TFP growth in each successive period—gold mines, fish products, copper, other rolled and cast metal products, stamped metal products, shipbuilding, and jewellery.

#### 3.4.2 Input Growth and Its Contribution to Output Growth

Our next task is to attribute growth in output to the growth of three types of inputs. Annex Table 3.A3 presents the average annual growth rates of capital, labour, and intermediate inputs in each of the 122 industries and for each of the three periods. As described in Section 3.3, the data on capital input are generated for five asset types, and the labour input is comprised of 168 types of workers. The intermediate input is made up of three categories — energy,

materials, and services. We first discuss the patterns of growth of the capital input, then those of labour and the intermediate input.

Table 3.3 ranks industries by pattern of input growth rate for each period. Considering the three periods in chronological order, 101, 46, and 39 industries, respectively, experienced annual rates of growth of the capital input in excess of 2 percent. The last period witnessed relatively weak growth in capital input, averaging 0.1 percent per year, while the first period recorded strong growth, averaging 4.7 percent annually. To gain a better understanding of the patterns of growth of the capital input by period, we narrow our focus to industries with annual growth rates higher than 6 percent and those with annual rates of decline higher than 2 percent. Over the three periods (1961-73, 1973-88, and 1988-95), 36, 14, and 12 industries, respectively, had a rate of growth of their capital input in excess of 6 percent. At the opposite end, during 1961-73 no industry had a negative capital input growth rate of 2 percent or more, but the situation changed in the two subsequent periods, when 7 and 42 industries underwent a decline in capital input growth over 1973-88 and 1988-95, respectively.

Among the 122 industries, 15 experienced an annual rate of growth of their capital input in excess of 8 percent over 1961-73; that number declined to 6 and 7 industries, respectively, during 1973-88 and 1988-95. Only professional business services had capital input growth in excess of 8 percent in all three periods. In 1973-88, capital input grew at a rate exceeding 8 percent in the following industries: motor vehicles, office machines, courier services, educational services, and laundries. In 1988-95, the following industries fell into that group: wooden boxes, platemaking, shipbuilding, miscellaneous transportation equipment, air transportation, and water systems. At the other end of the spectrum, no industry had an annual rate of decline in excess of 4 percent during 1961-73; only one industry, concrete products, fell into that category over 1973-88, but between 1988 and 1995, that number climbed to 18 and included 3 mining industries, 3 furniture-related industries, 2 steel manufacturing industries, and 5 metal products industries.

Growth Rate	Number of Industries								
	Capital Input			Labour Input			Intermediate Input		
	1961 -73	1973 -88	1988 -95	1961 -73	1973 -88	1988 -95	1961 -73	1973 -88	1988 -95
< -2%	0	7	42	4	13	37	1	5	27
-2% to 0%	9	29	24	11	30	38	0	13	19
0% to 2%	12	40	17	24	33	31	7	21	31
2% to 4%	28	21	15	48	26	14	14	48	23
4% to 6%	37	11	12	21	17	2	40	16	14
> 6%	36	14	12	14	3	0	60	19	8

Annex Table 3.A3 and Table 3.3 show that quality-adjusted labour input growth also underwent a slowdown over the entire period 1961-95. In the three subperiods, 107, 79, and 47 industries, respectively, experienced annual rates of labour input growth greater than 2 percent. In a typical industry, labour input grew 3.0 percent annually over 1961-88 and 1.1 percent annually over 1973-88, while during 1988-95, labour input actually fell by 1.0 percent per year. To contrast the patterns of input growth among subperiods, we narrow our discussion to industries with annual rates of growth of the labour input greater than 6 percent or with negative growth rates of more than 2 percent. Over the first two periods (1961-73 and 1973-88), 14 and 3 industries, respectively, had annual labour input growth rates in excess of 6 percent; in the last period (1988-95), no industry saw its labour input grow at more than 6 percent per year. The number of industries with rates of decline of their labour input exceeding 2 percent rose from 4 in 1961-73 to 13 in 1973-88 and 37 in 1988-95.

Among the 122 industries, crude petroleum and natural gas, plastics and synthetic resins, carpets, trucks, motor vehicles, and miscellaneous transportation equipment recorded annual rates of labour input growth exceeding 8 percent over 1961-73, but no industry reached that level during 1973-88 or 1988-95. In contrast, the number of industries showing rapid declines in labour input growth increased over the three periods: only gold mines experienced a labour input decline in excess of 4 percent per year during 1961-73, but in the next period three industries (iron mines, asbestos mines, and record players) were in that category; over 1988-95, the number climbed to 18.

Table 3.3 shows that in the three periods, 114, 83, and 45 industries, respectively, experienced growth in intermediate inputs greater than 2 percent. As we saw with the other two inputs, the first period witnessed strong growth in intermediate inputs, averaging 6.2 percent annually, while the second period showed moderately strong growth at an annual average of 3.0 percent. In the last period, intermediate inputs grew at a relatively weak average rate of 0.9 percent per year. When the focus is narrowed on industries with annual rates of growth greater than 6 percent or those with a negative growth rate higher than 2 percent, we note that over the three periods, 60, 19, and 8 industries, respectively, had intermediate input growth rates in excess of 6 percent, but none suffered a decline in excess of 2 percent in any of the three periods.

During 1961-73, 15 industries recorded intermediate input growth in excess of 8 percent per year. That number declined to 6 industries over 1973-88 and 5 in 1988-95. Both crude petroleum and professional services saw their intermediate input growth exceed 8 percent annually in the first two periods, but in the last two periods, only the office machine industry experienced annual growth above 8 percent. Railroads, miscellaneous transportation equipment, communications equipment, office machines, and electrical power led the upward trend in intermediate input growth during the last period.

The output growth figures presented for each industry in Annex Table 3A.2 are the sum of the contributions of the three inputs (capital, labour, and intermediate inputs) and of TFP growth. The contribution of each input is measured as the product of the share of that input in the value of output, and of its growth rate. Table 3.4 compares TFP growth with the sum of the contributions of all three inputs to output growth. It shows that TFP growth was the predominant factor (accounting for more than 50 percent of output growth) in 13 and 32 industries, respectively, over 1961-73 and 1973-88. The importance of TFP growth increased dramatically in the period 1988-95, when 68 industries relied on this factor as their predominant source of output growth. The surge in the importance of TFP growth is mainly attributable to a dramatic slowdown in input growth over the period, particularly labour and intermediate inputs. By comparing the contribution of TFP growth with that of each of the three inputs, Table 3.5 provides further insight into these developments. The number of industries where intermediate inputs were the primary source of output growth declined from 93 during 1961-73 to 67 during 1973-88, and 39 during 1988-95. On the other hand, the contribution of TFP growth gained considerably in significance for a number of industries over the

same periods: while it was the primary source of output growth in 17 industries over 1961-73, that number increased to 34 and 53, respectively, during 1973-88 and 1988-95. The contribution of capital input also became more important over the three periods, as this factor was the primary source of output growth in 6 industries during 1961-73, in 15 industries during 1973-88, and in 22 industries during 1988-95. The number of industries that relied on the contribution of the labour input as their primary source of expansion remained more or less constant throughout the three periods.

<b>Table 3.4</b>			
<b>Predominant Source of Output Growth Among 122 Industries</b>			
	<b>Number of Industries</b>		
	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>
Input Contribution	109	90	54
TFP Growth	13	32	68

<b>Table 3.5</b>			
<b>Primary Source of Output Growth in 122 Industries</b>			
	<b>Number of Industries</b>		
	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>
Capital Input Contribution	6	15	22
Labour Input Contribution	6	6	8
Intermediate Input Contribution	93	67	39
TFP Growth	17	34	53

### 3.4.3 Growth in the Quality of Capital and Labour Inputs

We can gain additional insight into the sources of output growth by analysing the implications of quality adjustments to capital and labour for TFP. Annex Tables 3.A4 and 3.A5 present findings on capital and labour quality growth, respectively, over the same three periods. They show that growth in capital input quality became progressively more important over the three periods. On average, quality grew at an annual rate of 0.8 percent during 1961-73, 0.9 percent during 1973-88, and 0.9 percent during 1988-95. Capital stock grew by 3.9 percent and 1.0 percent per year, respectively, in the first two periods, but declined by 0.8 percent annually in the last period.

Growth in capital input quality was a major source of capital input growth in 20 industries over the period 1961-73, in 54 industries over 1973-88, and in 76 industries over 1988-95. We reach similar conclusions with respect to labour quality in that this factor played an increasingly important role over time: growth in labour input quality was a predominant source of labour input growth in 20, 53, and 83 industries over the three successive periods.

Thus, for most industries, failure to incorporate quality change would result in attributing a greater share of output growth to TFP growth and a smaller share to input growth. In other words, if changes in capital and labour quality were omitted, TFP growth would be higher. In a typical industry, the omission of capital and labour quality would lead to overestimating TFP growth by 16 percent for the period 1961-73, by 22 percent for 1973-88, and by 44 percent for 1988-95.

### 3.5 Sources of Output and Labour Productivity Growth in the Private Business Sector

IN THIS SECTION, WE ANALYSE the sources of output and labour productivity growth in the Canadian private business sector. Our analysis is based on the premise that there exists an aggregate production function. As discussed in Jorgenson, Gollop, and Fraumeni (1987) and in Jorgenson (1995a, 1995b), this requires a number of restrictive assumptions, but it provides a useful framework for identifying the sources of economic growth in the aggregate economy. For the private business sector, the growth rate of TFP is the difference between the growth rate of value-added output and a weighted average of the growth rates of capital and labour inputs. Again, capital and labour have two components, quantity and quality, and they are broken down by the same components as the sectoral data described in Section 3.3.

Table 3.6 decomposes the sources of Canada's private business sector output growth over the three periods. In the first, output grew at 5.6 percent per year, with capital input contributing 1.2 percent annually, labour input 1.8 percent, and TFP 2.6 percent. However, there was a steady decline in the contributions of capital and labour inputs and of TFP growth over time, resulting in a slowdown of output growth. By 1988-95, private business sector output grew at only 1.5 percent per year, and the average contributions from the growth in capital and labour inputs, and from TFP had declined to 0.5, 0.6, and 0.4 percent, respectively. Moreover, the relative importance of

TFP growth declined over the three periods. The results show that TFP growth accounted for about 46 percent of output growth during 1961-73, but for only 22 percent and 26 percent, respectively, during 1973-88 and 1988-95. Capital input growth was responsible for 22 percent of output growth over 1961-73, and for about 32 percent in both 1973-88 and 1988-95.

	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>
Output Growth	5.56	3.27	1.48
Contributions of Capital Inputs	1.22	1.06	0.49
Contribution of Capital Stock	0.85	0.73	0.27
Contribution of Capital Quality	0.38	0.33	0.22
Contributions of Labour Inputs	1.76	1.49	0.60
Contribution of Hours Worked	1.29	1.30	0.22
Contribution of Labour Quality	0.47	0.19	0.38
TFP Growth	2.58	0.72	0.39

Table 3.7 illustrates how the figures reported in Table 3.6 changed from one period to another. From 1961-73 to 1973-88, the slowdown in TFP growth accounted for over 80 percent of the slowdown in the private business sector's growth and thus was clearly the dominant factor behind that development. By contrast, over 80 percent of the slowdown in output growth from 1973-88 to 1988-95 stemmed from the slowdown in the growth of both capital and labour inputs, and more specifically, from the slowdown in the growth of the capital stock and hours worked.

We end this section with an analysis of labour productivity growth, since it is directly related to the overall standard of living, defined as GDP per capita. Table 3.8 presents a summary view of labour productivity growth over the period 1961-95; it shows that labour productivity slowed down significantly after the first period — from 3.6 percent per year during 1961-73 to 1.2 percent during 1973-88, remaining at about that rate over 1988-95. TFP growth accounted for 72, 61, and 36 percent of labour productivity growth in 1961-73, 1973-88, and 1988-95, respectively. The lower contribution of TFP growth in the last period was more or less offset by labour quality: although this factor accounted for only 16 percent of labour productivity growth during 1973-88, that contribution had risen to 34 percent in the last period. Table 3.9 indicates that 78 percent of the labour productivity growth slowdown from 1961-73 to



1973-88 was accounted for by the slowdown in TFP growth (from 2.6 percent per year during 1961-73 to 0.7 percent per year during 1973-88). The rest of the labour productivity growth slowdown is accounted for by the slowdown in capital intensity and labour quality. Although TFP growth continued to decline, this was offset by a rebound in the growth of capital intensity and labour quality that prevented labour productivity growth from further slipping behind. Capital and labour quality together accounted for 24 percent of labour productivity growth over 1961-73, 44 percent over 1973-88, and 54 percent over 1988-95.

<b>Table 3.7</b>		
<b>Changes in the Sources of Output Growth in the Private Business Sector (%)</b>		
	<b>1973-88 Less 1961-73</b>	<b>1988-95 Less 1973-88</b>
Output Growth	-2.29	-1.79
Contributions of Capital Inputs	-0.16	-0.57
Contribution of Capital Stock	-0.12	-0.45
Contribution of Capital Quality	-0.04	-0.12
Contributions of Labour Inputs	-0.27	-0.89
Contribution of Hours Worked	0.01	-1.07
Contribution of Labour Quality	-0.28	0.19
TFP Growth	-1.86	-0.33

<b>Table 3.8</b>			
<b>Sources of Labour Productivity Growth in the Private Business Sector (%)</b>			
	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>
Labour Productivity Growth	3.56	1.19	1.12
Contributions of Capital Input/Hour	0.51	0.28	0.34
Contribution of Capital Stock/Hour	0.13	-0.05	0.12
Contribution of Capital Quality	0.38	0.33	0.22
Contribution of Labour Quality	0.47	0.19	0.38
TFP Growth	2.58	0.72	0.39

<b>Table 3.9</b>		
<b>Changes in the Sources of Labour Productivity Growth in the Private Business Sector (%)</b>		
	<b>1973-88 Less 1961-73</b>	<b>1988-95 Less 1973-88</b>
Labour Productivity Growth	-2.37	-0.17
Contributions of Capital Input/Hour	-0.23	0.06
Capital Stock/Hour	-0.18	0.17
Capital Quality	-0.05	-0.11
Contribution of Labour Quality	-0.28	0.19
TFP Growth	-1.86	-0.33

### 3.6 Conclusion

THIS STUDY HAS SHOWN that adjusting capital and labour inputs for changes in capital and labour quality allows a better understanding of economic growth in Canada. By incorporating quality adjustments to capital and labour inputs into the analysis, we attribute a greater proportion of output growth and labour productivity growth to input growth and, correspondingly, a smaller proportion to TFP growth.

Our results show that output growth in the Canadian private business sector slowed down from 5.6 percent during 1961-73 to 3.3 percent during 1973-88 and 1.5 percent during 1988-95. TFP growth accounted for about 46 percent of output growth over 1961-73, and for 22 percent and 26 percent, respectively, over 1973-88 and 1988-95. At the same time, over 80 percent of the slowdown in output growth observed from the first to the second period is attributable to the slowdown in TFP growth. On the other hand, over 80 percent of the slowdown in output growth from 1973-88 to 1988-95 originated from the slowdown in the growth of both capital and labour inputs. The slowdown in the growth of capital stock and hours worked was mainly responsible for the slower input growth between the two periods.

Labour productivity growth in Canada's private business sector also decreased significantly after 1973 — from 3.6 percent to 1.2 percent annually between 1961-73 and 1973-88, remaining at about the latter rate over 1988-95. TFP growth accounted for 72, 61, and 36 percent, respectively, of labour productivity growth over the three successive periods. The lower contribution of TFP

growth in the last period was more or less offset by labour quality, which had accounted for 16 percent of labour productivity growth during 1973-88, a contribution that rose to 34 percent in the last period. However, 78 percent of the slowdown in labour productivity growth between 1961-73 and 1973-88 was accounted for by the slower TFP growth. As with the decline in output growth, the rest of the labour productivity growth slowdown is attributable to slower growth in capital intensity and labour quality. Although TFP growth continued to decrease from 1973-88 to 1988-95, this was offset by a rebound in the growth of capital intensity and labour quality that prevented labour productivity growth from further slipping behind.

For a majority of the 122 industries covered in our study, input growth was a predominant source of output growth during 1961-73 and 1973-88. During 1988-95, however, TFP growth accounted for more than half of output growth in slightly more than half of those industries, primarily because input growth fell more than did productivity growth between 1973-88 and 1988-95.

This study serves as a first step towards understanding the sources of output and labour productivity growth in the Canadian economy. A number of refinements may prove fruitful in that respect. For example, capital input in our study is based on only five asset categories; it would undoubtedly be useful to develop these categories further, as this would help us better understand the sources of output and labour productivity growth in Canada. In addition, increasing the number of asset categories would make it possible to analyse the implications of investment in information technology for the Canadian economy.

## Notes

- 1 At the industry level, the U.S. Bureau of Labor Statistics does not adjust for labour quality, and at the economy-wide level, it aggregates capital input over different asset types and industries.
- 2 Described in Johnson (1994).
- 3 A double-declining-balance depreciation rate is used in Statistics Canada's estimates of capital stock.
- 4 See Appendix E for a detailed description.
- 5 See Dougherty (1992) for the method of calculating the present value of capital cost allowances.
- 6 See Appendix F for a detailed analysis.
- 7 The micro-data file for the 1961 Census is not available. However, very detailed information on employment and earnings disaggregated for one, two, and three characteristics of labour input are published by Statistics Canada. We thus employed the method of iterative proportional fitting to estimate the matrices of hours worked and labour compensation for 1961.

Annex:  
Detailed Industry Tables

<b>Table 3.A1</b>		
<b>List of Industries</b>		
<b>No.</b>	<b>Industries</b>	<b>Abbreviation</b>
1.	Agricultural and Related Service Industries	Agric.
2.	Fishing and Trapping Industries	Fishing
3.	Logging and Forestry Industries	Logging
4.	Gold Mines	Gold
5.	Other Metal Mines	Oth. Mines
6.	Iron Mines	Iron Mines
7.	Asbestos Mines	Asbestos
8.	Other Non-metal Mines (Except Coal)	Non-metal Mines
9.	Salt Mines	Salt
10.	Coal Mines	Coal
11.	Crude Petroleum and Natural Gas Industries	Crude Pet. and Gas
12.	Quarry and Sand Pit Industries	Quarry
13.	Service Industries Incidental To Mineral Extraction	Oth. Mining
14.	Poultry, Meat and Meat Products Industries	Poultry
15.	Fish Products Industries	Fish Prod.
16.	Fruit and Vegetable Industries	Fruit
17.	Dairy Products Industries	Dairy
18.	Feed Industry, Cane and Beet Sugar Industry, Miscellaneous Food Products Industries	Feed
19.	Vegetable Oil Mills (Except Corn Oil)	Veg. Oil
20.	Biscuit Industry, Bread and Other Bakery Products Industries	Biscuit
21.	Soft Drink Industry	Soft Drink
22.	Distillery Products Industry	Distillery
23.	Brewery Products Industry	Brewery
24.	Wine Industry	Wine
25.	Tobacco Products Industries	Tobacco
26.	Rubber Products Industries	Rubber
27.	Plastic Products Industries	Plastic
28.	Leather Tanneries, Footwear Industry, Miscellaneous Leather and Allied Products Industries	Leather

<b>Table 3.A1 (cont'd)</b>		
<b>No.</b>	<b>Industries</b>	<b>Abbreviation</b>
29.	Man-made Fibre Yarn and Woven Cloth Industries, Wool Yarn and Woven Cloth Industries	Fibre Yarn
30.	Broad Knitted Fabric Industry	Knitted Fabric
31.	Miscellaneous Textile Products Industries	Misc. Textile
32.	Carpet, Mat and Rug Industry	Carpet
33.	Clothing, Hosiery Industries	Clothing
34.	Sawmill, Planing Mill and Shingle Mill Products Industries	Sawmill
35.	Veneer and Plywood Industries	Veneer
36.	Sash, Door and Other Millwork Industries	Sash
37.	Wooden Box and Coffin Industries	Wooden Box
38.	Other Wood Industries	Oth. Wood
39.	Household Furniture Industries	House. Furn.
40.	Office Furniture Industries	Office Furn.
41.	Other Furniture and Fixture Industries	Oth. Furn.
42.	Pulp and Paper Industries	Pulp
43.	Asphalt Roofing Industry	Roofing
44.	Paper Box and Bag Industries	Paper Box
45.	Other Converted Paper Products Industries	Oth. Paper
46.	Printing and Publishing Industries	Printing
47.	Platemaking, Typesetting and Bindery Industries	Platemaking
48.	Primary Steel Industries	Primary Steel
49.	Steel Pipe and Tube Industry	Steel Pipe
50.	Iron Foundries	Iron
51.	Non-ferrous Metal Smelting and Refining Industries	Non-ferrous
52.	Aluminium Rolling, Casting and Extruding Industries	Aluminium
53.	Copper and Alloy Rolling, Casting and Extruding Industries	Copper
54.	Other Rolling, Casting and Extruding, Non-ferrous Metal Products Industries	Oth. Roll.
55.	Power Boiler and Structural Metal Industries	Power Boiler
56.	Ornamental and Architectural Metal Products Industries	Ornamental
57.	Stamped, Pressed and Coated Metal Products Industries	Stamped
58.	Wire and Wire Products Industries	Wire
59.	Hardware, Tool and Cutlery Industries	Hardware
60.	Heating Equipment Industry	Heating
61.	Machine Shop Industry	Machine Shop
62.	Other Metal Fabricating Industries	Oth. Metal
63.	Agricultural Implement Industry	Agr. Implement

<b>Table 3.A1 (cont'd)</b>		
<b>No.</b>	<b>Industries</b>	<b>Abbreviation</b>
64.	Commercial Refrigeration and Air Conditioning Equipment Industries	Refrig.
65.	Other Machinery and Equipment Industries	Oth. M&E
66.	Aircraft and Aircraft Parts Industry	Aircraft
67.	Motor Vehicle Industry	Motor Veh.
68.	Truck and Bus Body and Trailer Industries	Truck
69.	Motor Vehicle Parts and Accessories Industries	Motor Parts
70.	Railroad Rolling Stock Industry	Railroad
71.	Shipbuilding and Repair Industry	Shipbuilding
72.	Miscellaneous Transportation Equipment Industries	Misc. Trans.
73.	Small Electrical Appliances Industry	Small Elec.
74.	Major Appliances Industries (Electric and Non-electric)	Major Appl.
75.	Other Electrical and Electronic Products Industries, Battery Industry	Oth. Elec.
76.	Record Player, Radio and Television Receiver Industries	Record Player
77.	Communications and Other Electronic Equipment Industries	Comm. Equip.
78.	Office, Store and Business Machine Industries	Office Machine
79.	Communications and Energy Wire and Cable Industries	Wire and Cable
80.	Clay Products Industries	Clay
81.	Hydraulic Cement Industry	Hydraulic
82.	Concrete Products Industries	Concrete
83.	Ready-mix Concrete Industry	Ready-mix
84.	Glass and Glass Products Industries	Glass
85.	Miscellaneous Non-metallic Mineral Products Industries	Misc. Non-met.
86.	Refined Petroleum and Coal Products Industries	Ref. Pet. and Coal
87.	Industrial Chemicals Industries N.E.C.	Oth. Ind. Chem.
88.	Chemical Products Industries N.E.C.	Oth. Chemical
89.	Plastic and Synthetic Resin Industry	Plastic and Syn.
90.	Pharmaceutical and Medicine Industry	Pharma.
91.	Paint and Varnish Industry	Paint
92.	Soap and Cleaning Compounds Industry	Soap
93.	Toilet Preparations Industry	Toilet
94.	Floor Tile, Linoleum and Coated Fabric Industries, Other Manufacturing Industries	Tile
95.	Jewellery and Precious Metal Industries	Jewellery
96.	Sporting Goods and Toy Industries	Sporting
97.	Sign and Display Industry	Sign
98.	Construction Industries	Construction

<b>Table 3.A1 (cont'd)</b>		
<b>No.</b>	<b>Industries</b>	<b>Abbreviation</b>
99.	Air Transport and Related Services Industries	Air Trans.
100.	Railway Transport and Related Services Industries	Rail Trans.
101.	Water Transport and Related Services Industries	Water Trans.
102.	Truck Transport Industries	Truck Trans.
103.	Urban, Interurban and Rural Transit Systems Industries, Miscellaneous Transport Services	Urban Trans.
104.	Pipeline Transport Industries	Pipeline
105.	Storage and Warehousing Industries	Storage
106.	Telecommunication Broadcasting Industries	Broadcasting
107.	Telecommunication Carriers Industries	Tel. Carrier
108.	Postal and Courier Services Industries	Courier
109.	Electric Power Systems Industry	Electric Power
110.	Gas Distribution Systems Industry	Gas Dist.
111.	Water Systems and Other Utility Industries, N.E.C.	Water Sys.
112.	Wholesale Trade Industries	Wholesale
113.	Retail Trade Industries	Retail
114.	Finance and Real Estate Industries	Finance
115.	Insurance Industries	Insurance
116.	Professional Business Services, Advertising Services, Other Business Services	Professional
117.	Educational Services Industries, Private	Education
118.	Other Health and Social Services Industries	Oth. Health
119.	Accommodation and Food Services Industries	Accomod.
120.	Motion Picture and Video Industries, Other Amusement and Recreational Services	Motion Pic.
121.	Laundries and Cleaners, Other Personal Services Industries	Laundries
122.	Membership Organizations (Excluding Religious) and Other Services Industries	Membership



	Output Growth			TFP Growth		
	1961-73	1973-88	1988-95	1961-73	1973-88	1988-95
1. Agric.	3.49	3.84	2.17	2.12	1.22	1.35
2. Fishing	0.79	3.24	-2.26	-0.65	0.06	-2.40
3. Logging	3.99	2.33	1.97	1.59	1.46	-0.60
4. Gold	-6.68	5.85	2.32	-0.98	1.85	2.82
5. Oth. Mines	4.97	-0.70	-1.98	0.49	1.05	-0.70
6. Iron Mines	10.75	-1.90	-1.46	1.68	0.41	-0.27
7. Asbestos	3.69	-6.75	-3.48	-1.27	-2.57	0.77
8. Non-metal Mines	15.03	4.37	0.18	7.63	1.42	2.84
9. Salt	5.79	5.52	0.49	2.02	3.91	1.27
10. Coal	5.96	7.79	-0.39	2.44	3.82	3.12
11. Crude Pet. and Gas	10.50	0.41	3.78	3.51	-5.46	3.50
12. Quarry	5.69	3.48	-2.11	2.21	1.13	-3.37
13. Oth. Mining	5.62	5.54	1.79	-0.65	0.27	-0.26
14. Poultry	4.05	2.31	0.52	0.15	0.20	-0.38
15. Fish Prod.	2.96	2.51	-1.32	-0.61	0.19	1.29
16. Fruit	3.78	2.44	1.01	0.85	0.82	1.17
17. Dairy	1.99	1.23	-1.55	0.48	0.12	-0.63
18. Feed	3.60	1.89	2.45	0.88	-0.19	1.62
19. Veg. Oil	6.14	6.55	7.10	0.87	0.72	1.13
20. Biscuit	1.06	-0.95	0.71	0.94	-0.21	-0.32
21. Soft Drink	5.71	1.61	0.46	0.75	-0.21	0.35
22. Distillery	6.92	-2.03	-3.56	2.58	0.21	0.15
23. Brewery	4.78	1.45	0.22	1.94	-0.73	1.92
24. Wine	9.68	2.87	-2.92	2.54	1.44	-1.61

	Output Growth			TFP Growth		
	1961-73	1973-88	1988-95	1961-73	1973-88	1988-95
25. Tobacco	2.18	-1.10	-0.65	0.75	0.82	0.27
26. Rubber	7.59	1.52	4.35	1.20	0.72	3.18
27. Plastic	13.63	5.88	2.29	3.22	0.18	-0.10
28. Leather	0.88	-0.60	-6.18	0.59	1.09	-0.34
29. Fibre Yarn	4.62	0.26	-0.30	1.34	2.01	1.04
30. Knitted Fabric	10.04	1.79	1.09	2.16	2.73	1.27
31. Misc. Textile	5.80	2.70	-1.04	1.41	-0.10	0.70
32. Carpet	20.11	3.22	-4.26	3.86	1.46	-0.23
33. Clothing	4.58	1.41	-2.01	0.90	0.69	0.72
34. Sawmill	5.78	3.85	1.44	0.27	1.72	-1.05
35. Veneer	4.82	-0.36	0.16	0.64	1.05	-1.69
36. Sash	6.11	3.91	-2.22	0.66	-0.02	-0.64
37. Wooden Box	4.16	1.78	-1.25	0.43	0.54	-1.51
38. Oth. Wood	3.52	7.10	3.79	-1.06	1.36	1.29
39. House. Furn.	6.65	0.69	-3.67	1.53	-0.89	0.96
40. Office Furn.	8.51	6.27	-0.15	2.40	-0.24	0.90
41. Oth. Furn.	6.64	2.25	0.94	1.49	-0.65	1.91
42. Pulp	4.33	1.96	1.72	-0.15	0.19	-0.37
43. Roofing	2.78	4.00	-2.60	1.64	1.59	-0.10
44. Paper Box	5.38	1.16	0.78	1.05	0.03	0.39
45. Oth. Paper	6.57	1.68	1.07	0.96	-0.73	1.34
46. Printing	3.81	3.73	-2.23	0.46	0.52	-1.44
47. Platemaking	4.65	5.12	-3.67	1.06	1.25	-2.14
48. Primary Steel	6.81	0.83	-0.15	0.95	-0.50	1.22
49. Steel Pipe	5.07	2.78	2.59	1.87	0.56	2.69
50. Iron	6.34	0.20	2.22	1.56	1.08	1.54

	Output Growth			TFP Growth		
	1961-73	1973-88	1988-95	1961-73	1973-88	1988-95
51. Non-ferrous	3.41	1.53	2.85	0.15	0.81	0.26
52. Aluminium	7.61	3.16	1.15	1.72	0.49	-1.16
53. Copper	4.07	-1.54	-4.66	0.40	0.46	1.26
54. Oth. Roll.	5.87	3.22	-0.82	-0.05	0.14	1.73
55. Power Boiler	6.67	0.43	-0.58	1.88	0.54	-0.45
56. Ornamental	5.95	4.74	-3.06	-0.10	2.42	1.03
57. Stamped	6.51	3.57	-2.55	0.38	1.06	1.56
58. Wire	6.77	-0.27	-1.27	1.44	-0.18	0.86
59. Hardware	7.91	1.59	2.04	1.55	-0.46	1.56
60. Heating	2.93	1.63	1.01	1.39	0.18	2.11
61. Machine Shop	5.75	4.71	6.00	1.70	-0.01	3.29
62. Oth. Metal	7.09	-1.01	0.39	1.49	-0.34	0.71
63. Agr. Implement	7.51	-1.63	7.43	1.30	0.75	2.19
64. Refrig.	11.34	1.94	-1.30	1.93	0.93	0.85
65. Oth. M&E	8.60	2.86	2.62	1.27	0.22	0.24
66. Aircraft	0.20	5.17	2.10	0.40	-0.24	1.46
67. Motor Veh.	13.17	4.05	5.21	2.81	0.32	0.30
68. Truck	18.17	0.67	-1.27	1.70	0.35	0.10
69. Motor Parts	14.20	5.11	4.79	2.04	2.04	1.52
70. Railroad	11.89	-1.17	7.19	2.67	-1.55	-0.08
71. Shipbuilding	3.61	0.55	-6.38	-0.19	-0.18	0.06
72. Misc. Trans.	17.39	0.01	9.50	2.39	0.16	2.87
73. Small Elec.	9.71	-0.59	-6.88	3.67	0.87	1.09
74. Major Appl.	6.27	-0.27	-3.56	2.39	-0.32	1.76
75. Oth. Elec.	6.96	1.56	-3.38	2.18	0.50	-0.18
76. Record Player	9.39	1.16	-7.31	3.17	3.36	-1.58

	Output Growth			TFP Growth		
	1961-73	1973-88	1988-95	1961-73	1973-88	1988-95
77. Comm. Equip.	8.69	7.06	9.32	2.34	1.80	0.92
78. Office Machine	5.97	20.74	22.24	-0.33	7.00	3.99
79. Wire and Cable	5.52	1.45	-1.73	0.38	0.24	0.10
80. Clay	3.32	-1.31	-12.42	2.51	0.27	-6.16
81. Hydraulic	4.58	-0.29	-2.02	1.72	-0.28	-0.39
82. Concrete	5.88	0.51	-4.98	2.14	0.96	-1.45
83. Ready-mix	8.52	1.22	-3.30	0.77	-0.96	-0.67
84. Glass	6.85	2.04	-0.49	1.93	1.11	1.25
85. Misc. Non-met.	5.66	1.81	-2.37	2.14	0.49	-0.28
86. Ref. Pet and Coal	6.18	-0.12	1.32	0.75	0.18	0.34
87. Oth. Ind. Chem.	6.86	3.80	-0.29	1.32	1.11	1.58
88. Oth. Chemical	5.66	3.83	1.92	1.11	0.69	1.48
89. Plastic and Syn.	8.21	6.10	6.68	2.76	0.56	2.90
90. Pharma.	8.33	4.50	3.41	2.51	1.92	-0.57
91. Paint	4.59	2.20	-3.23	0.55	0.76	-2.49
92. Soap	3.89	4.09	-0.02	1.94	-0.13	2.00
93. Toilet	6.78	3.51	0.65	1.27	-0.08	2.44
94. Tile	6.09	1.90	0.11	1.79	-0.15	0.22
95. Jewellery	4.99	1.37	-3.20	-0.58	0.41	0.60
96. Sporting	7.36	2.33	3.93	1.36	0.84	1.77
97. Sign	4.38	3.87	-1.04	1.11	-1.29	1.17
98. Construction	4.09	2.76	-1.69	-0.05	0.76	-0.25
99. Air Trans.	8.81	4.30	0.13	1.68	0.06	-2.01
100. Rail Trans.	4.95	2.61	0.01	4.99	2.89	1.55
101. Water Trans.	6.02	0.21	-1.98	2.66	2.04	-1.14
102. Truck Trans.	6.16	4.68	3.80	1.50	1.10	0.84

<b>Table 3.A2 (cont'd)</b>						
	<b>Output Growth</b>			<b>TFP Growth</b>		
	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>
103. Urban Trans.	4.65	2.68	0.82	-0.63	-0.21	-1.44
104. Pipeline	11.86	1.27	6.74	6.69	0.50	1.89
105. Storage	2.61	1.91	0.80	1.49	-1.10	-0.53
106. Broadcasting	9.43	5.25	3.43	2.29	-0.70	-0.94
107. Tel. Carrier	8.36	8.18	4.83	4.68	4.94	1.79
108. Courier	4.53	5.65	1.74	1.93	-0.03	-1.94
109. Electric Power	8.45	4.56	1.56	2.78	0.31	-1.95
110. Gas Dist.	8.23	3.20	1.39	4.71	-0.75	-2.13
111. Water Sys.	9.24	6.47	1.31	1.13	1.28	-1.71
112. Wholesale	6.38	4.84	2.93	1.82	2.13	-0.01
113. Retail	5.37	3.63	1.87	2.35	0.83	0.16
114. Finance	5.81	4.07	3.32	-1.08	-2.11	1.91
115. Insurance	2.06	5.15	2.91	-1.37	2.19	-0.42
116. Professional	8.88	7.20	4.18	0.47	-0.59	-1.40
117. Education	3.91	2.29	-3.23	-1.05	3.28	-5.89
118. Oth. Health	7.32	5.26	2.34	0.10	0.56	-0.36
119. Accomod.	4.43	2.79	0.90	-0.47	-1.76	0.39
120. Motion Pic.	5.40	6.29	2.85	-0.48	-0.35	-1.38
121. Laundries	0.69	1.98	0.32	0.08	0.93	-1.74
122. Membership	6.98	6.26	2.96	1.39	-0.67	-1.31
Average	6.34	2.71	0.53	1.39	0.58	0.30

	Capital Input			Labour Input			Intermediate Input		
	1961-73	1973-88	1988-95	1961-73	1973-88	1988-95	1961-73	1973-88	1988-95
1. Agric.	1.61	0.06	-3.13	-3.00	-0.04	0.04	4.64	4.60	1.98
2. Fishing	2.00	-0.47	3.42	-2.23	4.46	-6.49	3.88	5.44	1.70
3. Logging	1.98	-2.60	-0.99	-0.27	-0.97	0.12	5.19	2.89	4.48
4. Gold	4.03	-0.31	-4.10	-8.92	5.34	-0.37	-4.44	11.28	2.74
5. Oth. Mines	4.10	-0.24	-2.90	2.38	-3.14	-2.59	8.69	-0.02	1.58
6. Iron Mines	10.22	-1.52	-0.79	3.46	-4.77	-0.21	10.96	-1.86	-2.01
7. Asbestos	7.45	-1.23	-1.80	1.71	-6.66	-0.81	5.27	-4.62	-7.04
8. Non-metal Mines	4.94	2.74	-8.16	5.61	1.56	1.90	11.79	3.94	2.37
9. Salt	4.50	-0.14	-3.87	2.18	1.34	1.20	4.60	3.00	0.09
10. Coal	13.39	3.07	-11.66	-2.57	2.94	-1.09	7.15	7.56	0.68
11. Crude Pet. and Gas	6.43	5.12	-1.09	8.96	7.01	-1.29	8.86	9.02	3.83
12. Quarry	3.00	0.56	6.35	0.67	1.85	1.65	6.16	3.81	-2.58
13. Oth. Mining	8.84	2.92	-3.22	4.63	6.86	1.73	6.08	5.58	2.79
14. Poultry	3.80	0.83	0.15	1.69	0.43	1.03	4.23	2.39	0.93
15. Fish Prod.	6.63	1.40	-1.12	4.00	2.05	-4.70	3.40	2.56	-2.03
16. Fruit	5.71	0.74	0.38	0.72	-0.57	0.87	3.08	2.50	-0.60
17. Dairy	6.66	0.68	-0.18	-1.21	-0.65	-1.95	1.59	1.41	-0.87
18. Feed	1.26	3.70	-2.40	1.17	1.01	0.41	3.26	1.98	1.93
19. Veg. Oil	3.11	4.25	3.35	2.99	4.31	2.80	5.55	5.99	6.65
20. Biscuit	0.52	-1.90	4.73	-0.76	-1.53	-0.42	0.59	0.30	0.36
21. Soft Drink	4.16	-0.02	-1.71	1.27	-0.99	-0.95	7.27	3.26	0.83
22. Distillery	4.51	-3.22	-1.81	2.69	-1.80	-8.76	4.72	-1.74	-2.71
23. Brewery	3.72	-0.51	-3.26	1.30	2.06	-2.50	2.98	3.72	0.20
24. Wine	4.30	-0.91	-2.05	6.00	1.06	-3.32	8.57	2.26	-0.59

	Capital Input			Labour Input			Intermediate Input		
	1961-73	1973-88	1988-95	1961-73	1973-88	1988-95	1961-73	1973-88	1988-95
25. Tobacco	1.80	-1.54	-2.31	-0.63	-3.37	-1.82	1.76	-1.56	0.12
26. Rubber	6.78	-0.22	3.10	3.67	0.64	-0.84	7.63	1.10	3.01
27. Plastic	5.37	4.43	2.59	8.52	4.48	1.82	12.17	6.37	2.66
28. Leather	2.84	-0.91	-2.12	-1.79	-2.55	-6.21	1.31	-1.30	-6.19
29. Fibre Yarn	4.14	-2.44	-1.00	0.13	-3.46	-3.09	4.50	-0.84	-0.59
30. Knitted Fabric	6.53	-1.97	5.11	3.35	-3.66	-0.28	8.92	-0.14	-0.93
31. Misc. Textile	5.88	1.32	-0.57	2.39	2.64	-2.05	5.07	3.17	-1.85
32. Carpet	8.75	-1.84	-3.95	11.67	-0.90	-5.57	18.97	2.83	-3.70
33. Clothing	4.98	1.68	1.79	0.90	-0.55	-4.71	5.10	1.28	-2.47
34. Sawmill	10.49	0.79	0.39	2.94	0.10	0.87	6.11	3.06	3.42
35. Veneer	7.56	-2.54	1.88	2.52	-2.95	-0.26	4.70	-0.68	2.39
36. Sash	1.86	1.20	-3.47	4.11	3.79	-1.71	6.52	4.40	-1.48
37. Wooden Box	5.37	-1.13	17.46	1.29	-0.84	-2.11	5.10	2.63	2.15
38. Oth. Wood	7.23	6.14	2.25	2.95	2.47	0.47	5.00	7.21	4.30
39. House. Furn.	5.24	1.58	-4.43	3.56	0.79	-4.65	6.13	2.09	-4.57
40. Office Furn.	7.10	5.04	-6.11	2.83	4.67	-0.23	8.60	7.84	-0.23
41. Oth. Furn.	5.31	0.24	-6.78	3.21	2.68	-0.88	6.27	3.43	0.14
42. Pulp	6.03	0.94	4.07	1.64	0.01	-1.39	5.36	2.63	2.25
43. Roofing	2.61	1.98	0.91	-1.65	1.87	-5.69	2.02	2.70	-3.45
44. Paper Box	5.19	0.88	-0.61	2.88	-0.31	0.49	4.80	1.66	0.43
45. Oth. Paper	7.33	3.66	2.98	4.59	0.38	-0.83	5.81	3.14	-0.35
46. Printing	3.46	1.93	-1.11	2.01	2.24	-0.32	4.55	4.39	-1.12
47. Platemaking	-0.04	1.58	10.35	2.25	3.18	-2.09	6.29	5.74	-3.34
48. Primary Steel	4.72	1.32	-4.93	3.80	-0.28	-4.56	7.19	2.11	0.19
49. Steel Pipe	-1.43	6.22	-14.21	4.13	1.14	0.15	3.55	2.34	1.81
50. Iron	3.82	-1.41	-0.28	3.34	-1.96	-0.63	6.27	0.22	1.82

	<b>Capital Input</b>			<b>Labour Input</b>			<b>Intermediate Input</b>		
	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>
51. Non-ferrous	2.73	2.46	5.95	0.78	-0.34	-2.02	3.87	1.02	3.19
52. Aluminium	4.88	1.11	4.54	2.58	-0.19	1.05	6.78	3.30	2.37
53. Copper	-1.36	-1.69	-5.08	1.80	-1.88	-4.67	4.28	-2.13	-5.76
54. Oth. Roll.	3.39	2.33	0.42	5.32	2.40	-1.68	6.57	3.59	-3.32
55. Power Boiler	3.96	-3.05	-6.33	3.62	-0.26	-0.18	5.66	0.87	1.29
56. Ornamental	5.01	0.99	-6.72	2.92	2.36	-5.44	7.96	2.36	-3.06
57. Stamped	7.05	2.39	-14.73	3.48	1.44	-1.42	7.09	2.99	-3.15
58. Wire	2.24	0.36	-6.86	3.84	-1.21	-1.20	6.63	0.22	-1.60
59. Hardware	3.48	2.46	-0.83	6.38	1.49	1.19	7.06	2.44	0.28
60. Heating	2.11	-0.76	-2.33	-0.61	2.68	-1.42	2.49	1.26	-0.46
61. Machine Shop	5.44	-1.73	3.44	2.87	5.01	1.73	4.88	5.63	3.85
62. Oth. Metal	4.62	-0.29	-7.65	3.96	-1.40	0.54	6.86	-0.35	0.93
63. Agr. Implement	2.70	-3.10	3.46	3.09	-1.99	0.46	8.25	-2.55	7.43
64. Refrig.	4.80	1.34	-3.87	7.32	0.64	-2.14	11.45	0.88	-2.01
65. Oth. M&E	2.87	0.62	3.80	5.36	2.65	-0.12	9.78	3.25	3.26
66. Aircraft	-0.37	3.61	0.83	-0.19	4.07	-1.02	0.18	6.75	2.12
67. Motor Veh.	3.18	11.47	-0.16	6.24	0.64	0.64	12.06	4.16	5.62
68. Truck	11.62	5.52	-0.38	13.62	-0.56	-0.71	17.73	0.38	-1.68
69. Motor Parts	9.10	3.29	-0.90	9.82	2.65	2.37	13.89	3.75	4.40
70. Railroad	-1.27	6.56	2.74	5.48	0.66	0.78	11.07	-1.46	10.74
71. Shipbuilding	1.58	-0.76	18.22	1.41	-1.77	-6.57	6.17	2.07	-10.93
72. Misc. Trans.	10.20	-1.13	12.34	11.08	-0.30	-2.12	17.77	0.28	8.75
73. Small Elec.	2.76	0.18	-16.98	4.89	-2.92	-10.96	7.50	-0.91	-5.83
74. Major Appl.	5.49	1.93	-2.92	1.48	-1.84	-5.18	4.89	0.35	-5.65
75. Oth. Elec.	3.67	-0.54	-2.80	3.47	-0.24	-4.97	5.88	2.19	-2.47
76. Record Player	5.83	0.25	1.78	1.82	-7.59	-15.01	8.01	-0.47	-5.47



	Capital Input			Labour Input			Intermediate Input		
	1961-73	1973-88	1988-95	1961-73	1973-88	1988-95	1961-73	1973-88	1988-95
77. Comm. Equip.	6.48	3.82	7.62	4.17	2.51	-0.05	8.72	7.80	12.34
78. Office Machine	6.90	12.64	-0.28	2.86	3.75	-0.64	7.89	18.07	22.47
79. Wire and Cable	2.75	1.55	-2.50	3.00	-0.82	-2.88	6.23	1.75	-1.78
80. Clay	-1.38	1.55	-8.92	-0.27	-2.85	-5.18	2.84	-2.22	-8.36
81. Hydraulic	-0.28	1.17	-5.36	2.80	-2.10	-2.58	5.67	0.60	0.01
82. Concrete	4.35	-6.34	-2.96	2.23	0.07	-3.08	4.53	1.22	-4.27
83. Ready-mix	14.23	1.91	-3.96	6.13	1.47	-1.93	7.08	2.06	-3.14
84. Glass	8.95	-1.62	-2.17	2.69	0.40	-4.52	5.57	2.12	0.28
85. Misc. Non-met.	2.33	1.70	-1.76	2.18	0.10	-2.78	4.79	1.96	-1.88
86. Ref. Pet and Coal	3.48	1.35	-2.60	1.80	-0.58	-1.72	6.03	-0.25	1.18
87. Oth. Ind. Chem.	5.88	4.76	-3.31	1.55	0.20	-2.69	6.80	3.18	-0.75
88. Oth. Chemical	4.94	1.53	-2.03	2.10	1.25	0.88	5.31	4.02	1.15
89. Plastic and Syn.	1.71	2.10	-1.04	2.02	2.80	2.71	7.77	6.60	4.74
90. Pharma.	5.61	1.27	5.60	3.66	1.78	1.54	6.95	3.37	4.06
91. Paint	4.57	-0.06	0.60	1.46	-0.08	0.13	5.04	2.22	-1.52
92. Soap	4.13	5.02	-0.72	1.36	2.51	-2.01	1.57	4.58	-2.15
93. Toilet	3.11	3.12	-1.41	6.00	3.63	-3.67	6.01	3.84	-1.13
94. Tile	6.86	2.77	1.13	2.13	1.70	-1.01	5.22	2.14	0.13
95. Jewellery	9.82	-0.01	2.61	3.36	-0.62	-1.60	5.99	1.23	-4.40
96. Sporting	5.80	0.23	4.53	4.59	0.01	2.75	6.71	2.51	1.51
97. Sign	2.83	6.75	-1.55	2.70	4.11	-1.62	4.26	5.58	-2.70
98. Construction	1.04	0.84	0.99	2.65	1.81	-1.12	5.17	2.35	-1.90
99. Air Trans.	5.27	3.76	8.10	6.60	3.00	1.47	8.38	5.31	1.99
100. Rail Trans.	-0.38	0.75	-4.58	-1.53	-3.30	-2.36	2.65	2.26	0.11
101. Water Trans.	-0.35	-0.72	-2.39	-0.76	-0.80	-3.79	7.51	-2.67	1.87
102. Truck Trans.	2.68	1.17	2.00	2.39	3.37	4.00	7.39	4.25	2.53

	<b>Capital Input</b>			<b>Labour Input</b>			<b>Intermediate Input</b>		
	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>
103. Urban Trans.	4.99	4.30	0.68	3.23	2.27	2.65	7.64	3.50	2.25
104. Pipeline	4.39	0.31	6.06	3.84	5.01	3.77	9.62	0.14	0.53
105. Storage	2.14	6.50	-1.85	0.45	0.99	1.42	0.81	3.31	2.51
106. Broadcasting	7.48	5.54	7.71	4.60	4.93	-0.29	8.85	6.92	5.35
107. Tel. Carrier	3.52	2.68	4.54	3.39	1.88	-0.05	4.81	8.03	4.32
108. Courier	6.67	12.61	-2.45	2.91	4.61	2.66	2.30	8.88	5.06
109. Electric Power	5.91	4.73	2.51	3.44	3.39	1.57	7.86	3.94	8.76
110. Gas Dist.	4.51	4.41	3.07	1.07	2.91	3.60	3.10	3.14	5.64
111. Water Sys.	7.22	2.38	9.98	5.89	5.67	3.94	9.51	6.05	0.74
112. Wholesale	1.61	1.90	2.21	4.97	1.95	1.97	5.57	4.47	4.86
113. Retail	1.35	2.16	4.81	2.64	2.67	0.36	4.42	3.35	3.15
114. Finance	6.54	7.01	1.12	6.11	4.30	0.20	8.20	6.84	2.60
115. Insurance	5.48	3.98	4.76	0.60	0.52	2.28	4.46	4.20	3.18
116. Professional	8.03	10.73	16.86	7.58	6.82	4.29	10.87	8.49	6.70
117. Education	9.25	13.71	7.10	5.68	2.84	3.71	5.14	2.84	4.35
118. Oth. Health	8.01	2.03	0.37	7.53	4.96	3.30	6.06	6.24	2.68
119. Accomod.	7.25	7.76	3.26	4.13	4.73	-0.86	5.12	3.65	1.37
120. Motion Pic.	8.07	7.89	4.06	5.14	5.23	2.79	5.82	7.22	5.17
121. Laundries	2.14	-0.39	1.29	0.19	0.22	1.44	2.02	3.30	3.62
122. Membership	6.96	13.59	5.77	5.72	4.00	3.64	4.70	7.98	4.80
Average	4.71	1.96	0.10	3.00	1.06	-0.96	6.21	3.01	0.90

	Capital Stock Growth			Capital Quality Growth		
	1961-73	1973-88	1988-95	1961-73	1973-88	1988-95
1. Agric.	0.17	0.06	-0.11	1.44	0.00	-3.03
2. Fishing	2.01	-0.59	3.39	-0.01	0.13	0.03
3. Logging	-0.04	-2.44	-2.46	2.02	-0.16	1.47
4. Gold	5.44	0.39	-4.01	-1.41	-0.70	-0.09
5. Oth. Mines	3.85	-1.08	-2.48	0.25	0.84	-0.42
6. Iron Mines	7.79	-2.17	0.37	2.42	0.65	-1.16
7. Asbestos	7.45	-2.70	-1.63	0.00	1.47	-0.16
8. Non-metal Mines	5.20	2.43	-7.88	-0.26	0.31	-0.28
9. Salt	4.26	0.06	-3.54	0.24	-0.20	-0.33
10. Coal	12.06	2.30	-11.40	1.33	0.77	-0.26
11. Crude Pet. and Gas	6.44	5.10	-1.11	-0.01	0.02	0.01
12. Quarry	2.50	1.08	7.27	0.49	-0.53	-0.92
13. Oth. Mining	7.49	3.01	-3.34	1.35	-0.09	0.11
14. Poultry	2.68	0.55	-0.30	1.12	0.28	0.45
15. Fish Prod.	3.10	0.88	-1.99	3.52	0.52	0.87
16. Fruit	5.90	0.16	0.41	-0.19	0.59	-0.03
17. Dairy	5.95	0.21	-0.54	0.71	0.47	0.37
18. Feed	4.26	3.95	-2.54	-3.00	-0.26	0.14
19. Veg. Oil	0.40	1.47	1.76	2.72	2.78	1.59
20. Biscuit	0.73	-1.52	4.63	-0.21	-0.38	0.11
21. Soft Drink	2.60	-0.48	-2.43	1.56	0.47	0.72
22. Distillery	4.08	-3.41	-1.14	0.43	0.19	-0.67
23. Brewery	2.18	-1.04	-3.27	1.54	0.53	0.01
24. Wine	3.48	-0.89	-2.28	0.81	-0.02	0.23

	<b>Capital Stock Growth</b>			<b>Capital Quality Growth</b>		
	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>
25. Tobacco	1.41	-1.81	-2.28	0.39	0.27	-0.04
26. Rubber	6.23	-1.35	-2.48	0.56	1.12	5.58
27. Plastic	4.07	4.51	2.53	1.30	-0.08	0.06
28. Leather	1.42	-0.41	-0.90	1.42	-0.49	-1.22
29. Fibre Yarn	4.15	-2.20	-0.70	-0.01	-0.23	-0.30
30. Knitted Fabric	5.76	-1.45	3.03	0.77	-0.52	2.08
31. Misc. Textile	5.96	1.42	-0.91	-0.08	-0.10	0.34
32. Carpet	8.28	-1.13	-2.00	0.46	-0.71	-1.95
33. Clothing	4.89	2.06	1.83	0.09	-0.38	-0.04
34. Sawmill	9.76	1.58	-1.66	0.73	-0.79	2.05
35. Veneer	6.12	-2.22	0.19	1.44	-0.32	1.69
36. Sash	2.52	0.74	-4.89	-0.67	0.45	1.42
37. Wooden Box	4.20	-0.50	3.79	1.18	-0.63	13.66
38. Oth. Wood	6.22	5.28	-1.34	1.01	0.86	3.58
39. House. Furn.	5.49	2.38	-5.06	-0.25	-0.79	0.63
40. Office Furn.	7.41	5.27	-11.77	-0.30	-0.23	5.67
41. Oth. Furn.	4.13	-0.25	-8.35	1.18	0.49	1.57
42. Pulp	6.22	1.05	2.79	-0.20	-0.11	1.28
43. Roofing	1.64	1.41	1.06	0.97	0.57	-0.15
44. Paper Box	4.80	0.93	1.15	0.39	-0.04	-1.76
45. Oth. Paper	6.08	2.91	1.29	1.25	0.75	1.69
46. Printing	3.35	1.54	0.10	0.10	0.39	-1.20
47. Platemaking	1.88	0.98	8.54	-1.92	0.60	1.81
48. Primary Steel	4.05	-0.18	-4.72	0.67	1.50	-0.22
49. Steel Pipe	-1.08	3.67	-13.44	-0.35	2.55	-0.77
50. Iron	3.36	-2.55	-1.24	0.46	1.14	0.96

	Capital Stock Growth			Capital Quality Growth		
	1961-73	1973-88	1988-95	1961-73	1973-88	1988-95
51. Non-ferrous	2.95	0.99	4.67	-0.23	1.47	1.28
52. Aluminium	5.60	1.30	2.51	-0.73	-0.19	2.03
53. Copper	-2.02	-2.68	-4.81	0.66	0.99	-0.27
54. Oth. Roll.	2.94	1.66	-0.38	0.44	0.67	0.80
55. Power Boiler	2.47	-2.83	-6.76	1.48	-0.22	0.43
56. Ornamental	3.42	0.94	-7.51	1.60	0.05	0.79
57. Stamped	5.27	1.55	-14.36	1.78	0.85	-0.37
58. Wire	1.68	0.57	-11.26	0.55	-0.20	4.40
59. Hardware	2.69	2.74	-2.53	0.80	-0.29	1.70
60. Heating	1.23	-1.22	-2.57	0.88	0.46	0.24
61. Machine Shop	4.48	-0.73	-3.19	0.96	-1.01	6.63
62. Oth. Metal	3.74	-0.38	-8.91	0.88	0.09	1.26
63. Agr. Implement	4.63	-7.08	2.28	-1.93	3.98	1.19
64. Refrig.	4.10	0.24	-4.06	0.70	1.10	0.18
65. Oth. M&E	2.28	-0.08	2.86	0.60	0.70	0.94
66. Aircraft	1.56	3.93	0.95	-1.92	-0.32	-0.12
67. Motor Veh.	2.34	3.48	-4.56	0.84	7.99	4.40
68. Truck	11.06	5.09	4.88	0.56	0.43	-5.26
69. Motor Parts	7.47	2.03	0.24	1.64	1.25	-1.15
70. Railroad	-0.90	5.02	2.02	-0.37	1.54	0.73
71. Shipbuilding	4.70	-1.12	7.06	-3.12	0.36	11.16
72. Misc. Trans.	11.32	-2.99	11.67	-1.11	1.86	0.67
73. Small Elec.	0.51	-0.42	-22.00	2.25	0.60	5.02
74. Major Appl.	5.39	1.87	-3.85	0.10	0.06	0.93
75. Oth. Elec.	2.89	-0.83	-2.89	0.79	0.29	0.09
76. Record Player	3.88	-1.54	9.77	1.95	1.79	-7.99

	<b>Capital Stock Growth</b>			<b>Capital Quality Growth</b>		
	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>
77. Comm. Equip.	5.61	2.97	10.49	0.87	0.86	-2.87
78. Office Machine	6.63	8.43	1.93	0.27	4.21	-2.21
79. Wire and Cable	2.96	2.61	-1.15	-0.20	-1.06	-1.35
80. Clay	-3.35	-0.35	-7.11	1.97	1.91	-1.82
81. Hydraulic	-1.11	1.24	-4.97	0.82	-0.07	-0.39
82. Concrete	4.57	-6.34	-3.58	-0.22	0.00	0.62
83. Ready-mix	12.00	0.79	-3.51	2.24	1.11	-0.45
84. Glass	8.02	-1.27	-1.73	0.93	-0.35	-0.44
85. Misc. Non-met.	1.93	1.36	-1.43	0.40	0.34	-0.33
86. Ref. Pet and Coal	-3.74	-2.99	-2.40	7.22	4.35	-0.20
87. Oth. Ind. Chem.	5.25	3.23	-3.16	0.63	1.53	-0.15
88. Oth. Chemical	3.62	1.06	-2.21	1.32	0.47	0.18
89. Plastic and Syn.	1.48	1.23	-1.37	0.23	0.87	0.33
90. Pharma.	4.21	0.83	5.26	1.40	0.45	0.34
91. Paint	3.66	-0.41	0.30	0.91	0.35	0.30
92. Soap	1.27	4.15	-1.62	2.86	0.87	0.91
93. Toilet	0.67	3.16	-1.34	2.45	-0.04	-0.08
94. Tile	6.01	2.20	0.93	0.85	0.57	0.20
95. Jewellery	10.12	-4.61	-14.41	-0.30	4.60	17.02
96. Sporting	7.16	0.05	3.17	-1.36	0.18	1.37
97. Sign	2.60	6.36	-1.66	0.23	0.40	0.10
98. Construction	-0.48	-0.13	-0.14	1.52	0.97	1.13
99. Air Trans.	5.27	3.40	8.06	0.00	0.36	0.04
100. Rail Trans.	-0.55	-0.32	-4.22	0.17	1.07	-0.36
101. Water Trans.	0.14	-0.74	-2.38	-0.50	0.01	-0.01
102. Truck Trans.	1.71	1.13	2.32	0.97	0.04	-0.33

<b>Table 3.A4 (cont'd)</b>						
	<b>Capital Stock Growth</b>			<b>Capital Quality Growth</b>		
	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>
103. Urban Trans.	4.24	3.11	-0.88	0.75	1.20	1.56
104. Pipeline	3.99	-0.14	5.94	0.40	0.44	0.12
105. Storage	1.41	10.96	-5.22	0.73	-4.46	3.37
106. Broadcasting	5.22	5.09	6.01	2.26	0.45	1.70
107. Tel. Carrier	3.83	2.32	4.35	-0.30	0.35	0.19
108. Courier	4.28	3.53	-1.84	2.39	9.08	-0.61
109. Electric Power	5.18	4.25	2.45	0.73	0.48	0.06
110. Gas Dist.	3.99	3.81	2.78	0.52	0.61	0.29
111. Water Sys.	7.75	-0.83	9.79	-0.54	3.21	0.19
112. Wholesale	0.56	1.77	0.31	1.05	0.13	1.90
113. Retail	0.62	2.33	1.15	0.73	-0.17	3.66
114. Finance	4.99	3.16	1.01	1.55	3.85	0.10
115. Insurance	4.48	2.99	4.70	1.00	0.99	0.06
116. Professional	6.64	6.19	10.23	1.39	4.54	6.63
117. Education	2.82	2.72	5.39	6.43	10.99	1.71
118. Oth. Health	6.50	1.25	0.13	1.51	0.78	0.24
119. Accomod.	5.83	4.16	2.58	1.42	3.60	0.68
120. Motion Pic.	5.24	2.89	3.68	2.83	5.00	0.38
121. Laundries	3.61	0.53	0.39	-1.46	-0.91	0.90
122. Membership	-1.43	1.31	2.13	8.39	12.28	3.64
Average	3.93	1.02	-0.75	0.78	0.93	0.85

	Hours Worked Growth			Labour Quality Growth		
	1961-73	1973-88	1988-95	1961-73	1973-88	1988-95
1. Agric.	-3.38	-0.59	-0.37	0.38	0.55	0.41
2. Fishing	-2.94	4.53	-7.15	0.71	-0.07	0.65
3. Logging	-0.81	-1.09	0.19	0.54	0.12	-0.07
4. Gold	-9.49	4.80	-0.14	0.57	0.54	-0.23
5. Oth. Mines	2.19	-3.31	-2.49	0.19	0.18	-0.09
6. Iron Mines	3.05	-4.89	-0.16	0.41	0.11	-0.06
7. Asbestos	1.22	-7.04	-1.10	0.48	0.38	0.29
8. Non-metal Mines	5.03	1.21	1.66	0.58	0.36	0.24
9. Salt	1.80	1.11	0.90	0.38	0.23	0.30
10. Coal	-3.35	2.59	-0.91	0.79	0.34	-0.18
11. Crude Pet. and Gas	8.89	6.73	-1.81	0.06	0.28	0.52
12. Quarry	0.18	1.74	1.51	0.49	0.11	0.13
13. Oth. Mining	4.45	6.53	1.64	0.18	0.33	0.08
14. Poultry	1.48	0.42	1.05	0.21	0.00	-0.02
15. Fish Prod.	3.96	2.05	-4.83	0.05	0.00	0.13
16. Fruit	0.66	-0.78	0.27	0.06	0.21	0.61
17. Dairy	-1.62	-0.74	-2.32	0.42	0.08	0.37
18. Feed	0.82	0.65	0.09	0.35	0.36	0.32
19. Veg. Oil	2.93	1.98	3.06	0.06	2.33	-0.25
20. Biscuit	-0.88	-1.89	-0.53	0.12	0.36	0.11
21. Soft Drink	0.13	-1.28	-1.35	1.14	0.29	0.40
22. Distillery	2.26	-3.22	-9.07	0.43	1.43	0.31
23. Brewery	1.12	1.77	-3.13	0.18	0.30	0.63
24. Wine	5.79	0.94	-3.33	0.21	0.12	0.00



<b>Table 3.A5 (cont'd)</b>						
	<b>Hours Worked Growth</b>			<b>Labour Quality Growth</b>		
	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>
25. Tobacco	-1.44	-3.97	-2.59	0.80	0.60	0.78
26. Rubber	3.46	0.35	-0.92	0.21	0.29	0.08
27. Plastic	8.34	4.16	1.42	0.19	0.32	0.40
28. Leather	-1.71	-2.63	-6.63	-0.08	0.07	0.42
29. Fibre Yarn	-0.25	-4.49	-3.31	0.37	1.03	0.21
30. Knitted Fabric	3.00	-4.61	-0.89	0.36	0.96	0.61
31. Misc. Textile	2.17	2.23	-2.57	0.22	0.40	0.52
32. Carpet	11.17	-1.25	-6.26	0.50	0.35	0.70
33. Clothing	0.90	-0.54	-4.94	-0.01	-0.01	0.23
34. Sawmill	2.38	-0.18	0.71	0.56	0.28	0.17
35. Veneer	1.97	-3.22	-0.52	0.56	0.27	0.25
36. Sash	3.58	3.67	-1.85	0.53	0.11	0.14
37. Wooden Box	0.73	-1.26	-2.41	0.56	0.42	0.30
38. Oth. Wood	2.61	1.98	0.38	0.34	0.49	0.08
39. House. Furn.	3.33	0.54	-4.75	0.24	0.25	0.10
40. Office Furn.	2.59	4.77	-0.51	0.25	-0.09	0.28
41. Oth. Furn.	2.97	2.32	-1.42	0.24	0.35	0.54
42. Pulp	1.41	-0.22	-1.58	0.24	0.23	0.19
43. Roofing	-2.41	1.62	-6.70	0.76	0.25	1.02
44. Paper Box	2.38	-0.70	0.03	0.50	0.39	0.45
45. Oth. Paper	4.20	0.00	-1.22	0.39	0.38	0.40
46. Printing	1.77	2.20	-0.65	0.23	0.04	0.33
47. Platemaking	2.62	3.28	-2.52	-0.37	-0.11	0.43
48. Primary Steel	3.59	-0.56	-4.79	0.21	0.28	0.24
49. Steel Pipe	3.97	0.80	-0.17	0.16	0.34	0.32
50. Iron	2.96	-2.17	-0.94	0.38	0.21	0.31

	<b>Hours Worked Growth</b>			<b>Labour Quality Growth</b>		
	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>
51. Non-ferrous	0.36	-0.51	-2.16	0.42	0.17	0.14
52. Aluminium	2.02	-0.52	0.77	0.57	0.34	0.28
53. Copper	1.36	-2.11	-5.00	0.43	0.23	0.32
54. Oth. Roll	5.07	2.19	-1.98	0.25	0.21	0.30
55. Power Boiler	3.24	-0.47	-0.55	0.38	0.21	0.36
56. Ornamental	2.69	2.30	-5.90	0.23	0.07	0.46
57. Stamped	3.18	1.17	-1.78	0.29	0.27	0.36
58. Wire	3.57	-1.43	-1.76	0.27	0.22	0.56
59. Hardware	6.07	1.34	0.69	0.31	0.16	0.51
60. Heating	-0.82	2.07	-2.11	0.21	0.61	0.68
61. Machine Shop	2.52	4.81	1.49	0.35	0.20	0.24
62. Oth. Metal	3.66	-1.74	0.08	0.30	0.34	0.46
63. Agr. Implement	2.73	-2.14	0.61	0.36	0.15	-0.15
64. Refrig.	6.79	0.19	-2.45	0.53	0.44	0.31
65. Oth. MandE	5.06	2.49	-0.44	0.30	0.17	0.33
66. Aircraft	-0.82	3.89	-1.24	0.63	0.18	0.22
67. Motor Veh.	5.78	0.54	0.55	0.46	0.10	0.09
68. Truck	13.61	-0.73	-0.94	0.02	0.17	0.23
69. Motor Parts	9.70	2.53	1.90	0.12	0.12	0.47
70. Railroad	5.12	0.40	0.71	0.36	0.27	0.07
71. Shipbuilding	0.79	-2.01	-6.77	0.62	0.24	0.20
72. Misc. Trans.	10.59	-0.82	-1.94	0.49	0.51	-0.18
73. Small Elec.	4.77	-3.07	-11.44	0.12	0.16	0.48
74. Major Appl.	1.21	-2.01	-5.54	0.27	0.17	0.36
75. Oth. Elec.	3.40	-0.46	-5.49	0.08	0.21	0.53
76. Record Player	1.86	-7.95	-15.37	-0.04	0.36	0.37

<b>Table 3.A5 (cont'd)</b>						
	<b>Hours Worked Growth</b>			<b>Labour Quality Growth</b>		
	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>
77. Comm. Equip.	4.00	2.19	-0.71	0.17	0.32	0.66
78. Office Machine	2.52	3.34	-1.17	0.34	0.42	0.53
79. Wire and Cable	2.60	-1.16	-3.15	0.39	0.35	0.27
80. Clay	-0.41	-3.10	-4.92	0.14	0.25	-0.26
81. Hydraulic	2.40	-2.54	-2.50	0.40	0.43	-0.08
82. Concrete	1.74	-0.17	-3.46	0.49	0.23	0.38
83. Ready-mix	5.67	1.29	-2.00	0.46	0.18	0.07
84. Glass	2.37	0.20	-4.71	0.32	0.20	0.19
85. Misc. Non-met.	1.80	-0.18	-3.04	0.38	0.29	0.26
86. Ref. Pet and Coal	1.50	-0.74	-2.39	0.31	0.16	0.67
87. Oth. Ind. Chem.	1.28	-0.17	-3.35	0.27	0.37	0.66
88. Oth. Chemical	1.84	0.87	0.22	0.26	0.38	0.66
89. Plastic and Syn.	1.64	2.29	2.22	0.39	0.51	0.49
90. Pharma.	3.36	1.59	1.06	0.30	0.19	0.48
91. Paint	1.16	-0.26	-0.26	0.30	0.18	0.39
92. Soap	1.03	2.31	-2.37	0.33	0.20	0.36
93. Toilet	4.63	3.28	-4.24	1.37	0.35	0.57
94. Tile	1.85	1.49	-1.69	0.28	0.21	0.67
95. Jewellery	3.22	-0.63	-1.53	0.14	0.01	-0.08
96. Sporting	4.36	-0.23	2.44	0.23	0.25	0.31
97. Sign	2.43	4.03	-1.61	0.27	0.09	-0.01
98. Construction	2.21	1.40	-1.31	0.44	0.41	0.19
99. Air Trans.	6.01	2.81	0.95	0.59	0.18	0.52
100. Rail Trans.	-1.93	-3.47	-2.44	0.40	0.17	0.08
101. Water Trans.	-1.18	-0.97	-3.71	0.42	0.18	-0.08
102. Truck Trans.	2.05	3.21	3.97	0.34	0.16	0.03

<b>Table 3.A5 (cont'd)</b>						
	<b>Hours Worked Growth</b>			<b>Labour Quality Growth</b>		
	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>	<b>1961-73</b>	<b>1973-88</b>	<b>1988-95</b>
103. Urban Trans.	2.84	1.99	2.38	0.40	0.28	0.27
104. Pipeline	3.28	4.76	3.55	0.56	0.24	0.22
105. Storage	0.28	0.90	1.41	0.17	0.09	0.01
106. Broadcasting	4.02	4.82	-0.49	0.58	0.11	0.20
107. Tel. Carrier	2.85	1.50	-0.19	0.54	0.37	0.15
108. Courier	2.48	4.41	2.61	0.43	0.20	0.04
109. Electric Power	2.85	3.01	1.24	0.59	0.38	0.33
110. Gas Dist.	0.72	2.64	3.46	0.34	0.27	0.14
111. Water Sys.	5.40	5.52	3.90	0.49	0.15	0.04
112. Wholesale	4.64	1.81	1.55	0.33	0.14	0.42
113. Retail	2.34	2.56	0.30	0.30	0.10	0.06
114. Finance	5.97	4.18	-0.23	0.14	0.11	0.43
115. Insurance	0.89	0.42	1.96	-0.29	0.10	0.32
116. Professional	8.16	6.28	3.69	-0.58	0.53	0.60
117. Education	4.56	2.00	3.39	1.12	0.84	0.32
118. Oth. Health	8.02	6.17	3.87	-0.49	-1.21	-0.57
119. Accomod.	3.57	4.59	-1.02	0.56	0.14	0.16
120. Motion Pic.	4.57	5.14	2.64	0.57	0.08	0.15
121. Laundries	-0.89	0.37	0.99	1.08	-0.14	0.45
122. Membership	5.64	3.95	3.44	0.08	0.05	0.20
Average	2.65	0.79	-1.24	0.35	0.27	0.28