INDUSTRIAL CONCENTRATION AND CROWN CORPORATIONS

IN

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BY

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Part Three: Conclusions and Policy Recommendations

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Chapter Four: Conclusions

4.1 industrial Concentration

This study focuses on industrial concentration. This refers to the organization of markets, businesses, and industries. Regarding the causes and consequences of industry concentration, economists cannot agree on anything. According to some economists, concentration damages small enterprises, increases inflation and unemployment, produces excessive profits for large corporations, and skews an enterprise economy's allocation mechanism. Concentration, according to other economists, promotes high capital investment and efficiency in addressing both domestic and global demands and objectives.

If we rely only on concentration data to observe the structure of an industry, there is much we do not know. A recent study by the Conference Board, "The Relativity of Concentration Observations," has expressed the following criticisms of concentration data.

i) Concentration data gives us no concrete information on the ways that companies and markets interact, on how markets differ from one another, or on how diversified companies participate in their various markets.
ii) A concentration ratio is not a direct measure of how efficiently an industry operates, how well it serves its customers, its level of technology, its foreign competition, or its position in its life cycle.
iii) No single number, like an age, or a concentration ratio, can accurately depict the shape of an individual market, its makeup or its competitiveness.
iv) As a measure of competition, concentration does not explain company rivalry in product specifications and appearances, or in geographic or time terms.

The usefulness of concentration data, according to the Conference Board report is in helping to answer questions such as:

I) How much manufacturing activity is attributable to the largest industrial firms. How has this changed over time? Which firms contribute most to the change? Why?
II) What is the trend in industry and product concentration? What is the relation between levels of concentration and employee output? Are more or fewer firms producing an industry's products?

I shall make some conclusions regarding company concentration based on the Conference Board's concerns. First, it is evident from the foregoing that corporate concentration by itself is neither beneficial nor detrimental. Of concern is the possibility that concentration will lead to undesirable practices or effects. The data of section 2.2 confirmed that even at the 2-digit level,

primary metals, paper and allied, and petroleum and coal products fell into the concentrated category.

Recall that the S.I.C. system is a collection of classifications intended to categorize businesses according to their core activity. The criteria include similarities in product distribution networks, manufacturing methods, physical attributes of the products produced, and material inputs used in production. The industry may or may not be a place of direct competition because products that belong to the same category may or may not be interchangeable in usage or manufacturing.

Nevertheless, the concentration data can be used, if judiciously interpreted, if one looks at the type of products produced from the list of twelve largest corporations found in section2.3.

To allow for incompatibilities in classification, Appendix 1 provides 4-firm, 8-firm, and 12-firm concentration ratios at the 4-digit S.I.C. level, along with a list of the twelve largest corporations.

Here is a list of industries with 4-firm concentration ratios in excess of 45%.

1) Two-Digit S.I.C. Level:

Forestry	Clothing	Paper & Allied
Printing & Publishing	Primary Metal	Transportation Equipment
Non-Metallic Mineral	Petroleum & Coal	Chemical & Chemical Products

2) Three-Digit S.I.C. Level:

Meat & Poultry	Fish	Fruit & Vegetable
Dairy	Feed	Bakery
Miscellaneous Food	Beverage	Veneer & Plwyood Mills
Misc. Wood Industries	Pulp & Paper	Paper Box & Bag
Commercial Printing	Publishing & Printing	Smelting & Refining
Fabricated Structural	Wire & Wire Products	Hardware, Tool & Cutlery
Motor Vehicle Manufacturers		
Communications Equipment	Petroleum Refineries	Electric Wire & Cable
Truck Body/Trailer	Shipbuilding & Repair	Ready-Mix Concrete
Paint & Varnish	Industrial Chemicals (Inorganic)	Cement Manufacturers

3. Four-Digit S.I.C. Level:

Slaughtering & Meat Processors	Poultry Processors
Fish Products	Fruit and Vegetable
Dairy Products	Feed
Bakeries	Miscellaneous Food
Soft Drink Manufacturers	Breweries
Plastics Fabricating	Veneer & Plywood Mills
Pulp and Paper	Paper & Plastic
Commercial Printing	Publishing & Printing
Smelting & Refining	Fabricated Structural
Metal Door & Window	Metal Stamping &
Motor Vehicle Manufacturers	Pressing
Wire & Wire Products	Hardward, Tool &
Electric Wire and Cable	Cutlery
Non-Commercial Trailer	Shipbuilding & Repair
Ready-Mix Concrete	Petroleum Refining
Cement Manufacturers	Industrial Chemicals
Paint and Varnish	(Inorganic)

We now check these concentration ratios against two factors. The first is economies of scale. The second is foreign competition and exports.

First, if the actual minimum efficient or average efficient firm size for an industry is large relative to the market area served, then the industry could appear concentrated because of firms' need to achieve low unit costs. In Table 1.5.1 we listed engineering estimates of minimum efficient firm size.

In Chapter One we pointed out that engineering estimates reflect only purely technological factors, they do not reflect:

1. market size,
2. growth in market,
3. growth or decline in the availability of production inputs,
4. stability of product market, input markets,
5. geographic concentration of producers and consumers.

Referring to Table 1.5.1 it is reaidly apparent for Breweries, Petroleum Refining, Paint and Varnish, Ready-Mix Concrete, and Smelting and Refining that even at the National Level, the domestic market is small relative to the engineering estimates of minimally efficient firm size. (M.E.S.)

Firms whose plants are significantly below the engineering minimally efficient firm size manage to survive. A study by R.S. Khemani found that 95% of firms who survive had a plant capacity which accounted for less than 3% of the industry size.

Table 4.1.1 shows the relationship between the largest Canadian firms and the engineering estimate of Minimum Efficient Plant Size. Notice that only manufacturers of shoes, glass bottles, cotton and synthetic Broad Woven Fabrices, and bricks have plants whose capacity is in excess of M.E.S.

Scale economies can be a barrier to entry. Joe Bain originally examined the problem of how much price can be raised above minimum average cost without attracting entry by other producers. Given the estimates by Khemani it would appear that in most industries price cannot be raised significantly above minimum average cost without attracting entry.

Gorecki has supplied data which qualifies the above to include the egional dimension of certain markets. Tables 4.1.2 and 4.1.3 present the minimum efficient plant size and average efficient plant size, on a survivor basis, for the national industry size and the regional industry size. While these data are not applicable directly to B.C.'s industries, they are very suggestive.

The industries listed above have four-firm concentration ratios in excess of 45 percent. This means that, on average each of these firms accounted for more than 11 percent of the industries production. On the basis of Tables 4.1.2 and 4.1.3, it appears that the following industries might be too concentrated, taking even the regional dimension into consideration:

poultry processing	veneer and plywood mills
fruit and vegetable canning	petroleum refining
soft drink manufacturing	ready-mix concrete

The other industries might be too concentrated, as well but lack of data regarding efficient firm size preclude drawing any conclusions.

It is important to notice that the examination of further factors could lead to a very different conclusion for any of the above industries.

The use of 45 per cent as the "critical concentration ratio" is somewhat arbitrary, but some justification exists. Recent American studies indicate that the critical four-firm ratio in the retail gasoline sector is about 50 per cent. At levels of concentration above 50 per cent it was found that the industries became effectively collusive.

Let us now consider the international dimension of concentration. If concentration results from the need to compete effectively on international markets, then policies that inhibit concentration may impair the effectiveness of B.C. industries. We now check the industries that were concentrated against the export and import data found in Table 2.8.2

Of the industries found to be concentrated at the two digit level, forestry, non-metallic minerals, primary metals, petroleum and coal; paper and allied, petroleum and coal products, and chemical and chemical products have substantial entries on export account. Only transportation equipment and the electrical products industries have a substantial entry on import account. Note that a considerable amount of this product is probably transhipped to the rest of Canada.

Table 4.1.1
(Thousands of Dollars)

Exports

	1979	1980
Fish and Marine Animals*	384,395	231,141
Grain, Flour, Meal and Cereal Products	1,253,370	1,564,346
Rapeseed, Mustard, Flaxseed	549,138	433,967
Crude Wood Materials*	100,146	145,465
Wood Fabricated Materials*	2,242,812	2,000,871
Wood Pulp and Similar Pulp*	1,187,227	1,576,211
Paper and Paperboard*	656,679	793,764
Metals in Ores, Concentrates and Scrap*	845,700	1,027,247
Non-ferrous Metals*	455,315	768,634
Crude Non-metallic Minerals (except Coal and Petroleum)	259,053	591,436
Chemicals and Related Products	377,113	626,949
Coal	712,399	755,703
Crude Petroleum and Natural Gas	2,202,643	2,914,926
All Other Products	1,496,258	1,535,617
TOTAL	12,722,248	14,966,277

*Principally of B.C. origin

Imports

Food, Feed, Beverages and Tobacco	741,706	872,766
Crude Materials Inedible	371,891	438,247
Fabricated Forest Products	191,640	176,709
Textile Fabricated Materials	46,493	46,606
Chemicals, Petroleum and Coal Products	189,417	202,322
Iron, Steel and Alloys	389,518	387,253
Other Fabricated Materials	224,298	267,247
Machinery	662,063	788,899
Transportation & Communication Equipment	1,826,764	2,059,951
Other Equipment and Tools	323,740	387,978
Personal and Household Goods	239,479	260,956
Other Products and Special Transactions	335,663	410,919
TOTAL	5,542,672	6,299,853

Table 4.1.2

THE RATIO OF THE LARGEST PLANTS WHICH ACCOUNT FOR HALF OF INDUSTRY SIZE TO THE ENGINEERING ESTIMATE OF MINIMUM EFFICIENT PLANT SIZE FOR FIFTEEN CANADIAN MANUFACTURING INDUSTRIES: CIRCA 1967

INDUSTRY	VALUE OF THE RATIO
Breweries	0.26
Cigarettes	0.31
Paint & Varnish	0.32
Petroleum Refining	0.38
Non-rubber shoes	1.10
Portland Cement	0.83
Integrated Steel	0.92
Refrigerators & Freezers	0.13
Automobile Storage Batteries	0.63
Glass Bottles	1.18
Anti-friction Bearings	0.97
Cotton and Synthetic Broad Woven Fabrics	1.87
Sulphuric Acid	0.42
Bakeries	0.37
Bricks	3.89

Source: P.K Gorecki, Economies of Scale and Efficient Plant Size in Canadian Manufacturing Industries.

Table 4.1.3

A COMPARISON OF MINIMUM EFFICIENT PLANT SIZE AS A PERCENTAGE OF NATIONAL AND REGIONAL INDUSTRY SIZE FOR 14 CANADIAN MANUFACTURING INDUSTRIES 1966 AND 1972

Industry Name	MINIMUM EFFICIENT PLANT SIZE AS A PERCENTAGE OF National Industry Size 1966	1972	Regional Industry Size 1966	1972
Poultry Processors	1.49	2.46	4.47	7.01
Fruit & Vegetable Canners & Preservers	0.50	1.10	0.80	1.88
Bakeries	0.30	0.18	0.78	0.44
Soft Drink Manufacturers	0.72	0.39	1.84	1.02
Saw Mills & Planing Mills	0.10	0.18	0.19	0.31
Veneer & Plywood Mills	0.34	0.37	0.63	0.64
Wooden Box Factories	2.91	0.16	4.38	0.26
Coffin & Casket Industry	3.41	4.16	8.32	8.49
Paper & Plastic Bag Manufacturers	0.94	0.81	2.12	1.92
Iron Foundries	1.54	1.01	2.06	1.48
Clay Products Manufacturers'	1.43	1.81	2.50	3.14
Concrete Products Manufacturers	0.91	0.46	1.89	1.10
Petroleum Refining	1.11	1.20	3.49	1.25
Broom, Brush & Mop Industry	1.90	2.09	3.33	4.53
Average	1.26	1.17	2.63	2.39

Source: P.K Gorecki, Economies of Scale and Efficient Plant Size in Canadian Manufacturing Industries

Table 4.1.4

A COMPARISON OF AVERAGE EFFICIENT PLANT SIZE AS A PERCENTAGE OF NATIONAL AND REGIONAL INDUSTRY SIZE FOR 14 CANADIAN MANUFACTURING INDUSTRIES 1966 AND 1972

Industry Name	MINIMUM EFFICIENT PLANT SIZE AS A PERCENTAGE OF National Industry Size 1966	1972	Regional Industry Size 1966	1972
Poultry Processors	2.25	3.81	6.74	10.84
Fruit & Vegetable Canners & Preservers	1.28	2.72	2.06	4.67
Bakeries	0.74	0.50	1.95	1.24
Soft Drink Manufacturers	1.59	1.01	4.08	2.67
Saw Mills & Planing Mills	0.24	0.41	0.44	0.72
Veneer & Plywood Mills	0.66	0.75	1.23	1.29
Wooden Box Factories	6.36	0.64	9.57	1.09
Coffin & Casket Industry	6.73	7.52	16.41	15.35
Paper & Plastic Bag Manufacturers	2.50	1.60	5.65	3.80
Iron Foundries	4.03	1.97	5.41	2.91
Clay Products Manufacturers'	3.76	2.97	6.57	5.15
Concrete Products Manufacturers	1.74	0.90	3.64	2.16
Petroleum Refining	1.68	2.59	5.26	2.71
Broom, Brush & Mop Industry	5.67	2.89	9.97	6.25
Average	2.80	2.16	5.64	4.35

Source: P.K Gorecki, Economies of Scale and Efficient Plant Size in Canadian Manufacturing Industries

Table 4.1.5

Selected 4-Digit S.I.C.
Concentration Ratios by Industry

S.I.C.	Industry Description	4-Firm Ratio	8-Firm Ratio	12-Firm Ratio	Number of Firms
0310	Logging	48.9	62.5	72.2	1559
1011	Slaughtering & Meat Processors	72.9	93.3	98.0	49
1012	Poultry Processors	89.6	100		8
1020	Fish Products	65.5	79.8	87.9	61
1031	Fruit & Vegetable Canners & Preservers	78.7	93.3	99.0	27
1032	Frozen Fruit & Vegetables				11
1040	Dairy Products	60.5	88.8	96.5	44
1050	Flour & Breakfast Cereal Products				2
1060	Feed	72.3	91.3	98.3	27
1071	Biscuit Manufacturers				6
1072	Bakeries	56.1	68.0	73.3	237
1081	Confectionary Manufacturers				17
1082	Cane and Beet Sugar				4
1089	Miscellaneous Food	68.4	89.3	94.5	54
1091	Soft Drink Manufacturers	76.3	95.3	100	18
1092	Distilleries				10
1093	Breweries	100			8
1094	Wineries				5
1530	Tobacco Products				4
1623	Tire and Tube				3
1629	Misc. Rubber Products				13
1650	Plastics Fabricating	25.9	45.9	60.5	81
1720	Leather Tanneries				1
1740	Shoe Factories				8
1750	Leather Glove Factories				2
1799	Misc. Leather Products				10
1810	Cotton Yarn and Cloth				1
1820	Wool, Yarn and Cloth				1
1832	Man-Made Fibre, Yarn, Cloth				3
1840	Cordage and Twine				6
1851	Fibre Processing				1
1852	Pressed & Punched Felt				1
1860	Carpet, Mat & Rug				4
1871	Canvas Products, Cotton & Jute				1
1872	Canvas Products Manufacturers				22
1899	Misc. Textile Industries				31
2431	Men's Clothing Factories				26

S.I.C.	Industry Description	4-Firm Ratio	8-Firm Ratio	12-Firm Ratio	Number of Firms
2441	Women's Clothing Factories				20
2511	Shingle Mills	41.1	57.7	70.3	92
2513	Sawmills & Planing Mills	28.2	43.9	56.8	356
2520	Veneer & Plywood Mills	61.5	86.4	95.6	28
2541	Sash, Door & Other Millwork Plants	40.2	56.5	67.6	116
2543	Manufacturers of Prefab Buildings				13
2560	Wooden Box Factories				15
2580	Coffin & Casket Industry				4
2591	Wood Preservation Industry				11
2592	Wood Handles & Turning				5
2593	Manufacturers of Particle Board				2
2599	Misc. Wood Industries				19
2611	Furniture Re-upholstry & Repair				99
2619	Household Furniture Manufacturers				68
2640	Office Furniture Manufacturers				9
2660	Misc. Furniture & Fixtures Manuf.				29
2710	Pulp & Paper Mills	51.1	80.8	93.6	36
2720	Asphalt Roofing Manufacturers				3
2731	Folding Canton & Set-up Box Manufacturers				5
2732	Corrugated Box Manufacturers		99.7		
2733	Paper & Plastic Bag Manufacturers		71.0	99.8	11
2740	Misc. Paper Converters				26
2860	Commercial Printing	51.9	62.6	69.7	223
2870	Platemaking, Type-setting & Trade Bindery				32
2880	Publishing Only				84
2890	Publishing & Printing	69.1	89.8	95.5	85
2910	Iron & Steel Mills				5
2920	Steel Pipe & Tube Mills				3
2940	Iron Foundries				11
2950	Smelting & Refining	99.8			5

S.I.C.	Industry Description	4-Firm Ratio	8-Firm Ratio	12-Firm Ratio	Number of Firms
2960	Aluminum Rolling, Casting & Extruding				5
2970	Copper & Copper Alloy Rolling & Extruding				4
2980	Metal Rolling, Casting & Extruding				11
3010	Boiler & Plat Works				6
3020	Fabricating Structural Metal	74.4	90.5	96.2	35
3031	Metal Door & Window	56.3	76.4	86.9	40
3039	Ornamental & Architectural Metal				49
3041	Metal Coating				17
3042	Metal Stamping & Pressing	56.9	71.1	80.6	88
3059	Wire & Wire Products	80.7	97.7	100	30
3060	Hardware, Tool, and Cutlery	83.6	96.2	98.9	37
3080	Machine Shops	41.3	53.3	61.4	153
3110	Agriculture Implement				4
3150	Misc. Machinery & Equip	28.2	45.4	58.4	158
3160	Comm. Refrigeration and Air Conditioning				5
3180	Office & Store Machinery				15
3210	Aircraft & Aircraft Parts				23
3230	Motor Vehicle Manufacturers	100			10
3241	Truck Body Manufacturers				19
3242	Non-Commercial Trailer Manuf.	73.9	95.8	98.8	29
3243	Commercial Trailer Manuf.				9
3250	Motor Vehicle Parts & Accessories				23
3270	Shipbuilding & Repair	79.4	92.8	98.4	24
3280	Boat Building and Repair				99
3320	Major Appliances				18
3350	Communications Equip				44
3360	Electrical Industrial				36
3520	Cement				5
3530	Stone Products				10

S.I.C.	Industry Description	4-Firm Ratio	8-Firm Ratio	12-Firm Ratio	Number of Firms
3541	Concrete Pipe				6
3542	Structural Concrete				
3549	Concrete Products				48
3550	Ready-Mix Concrete	50.0	64.5	74.5	78
3651	Petroleum Refining	88.6			8
3652	Lubricating Oil & Greases				2
3730	Plastics & Synthetic Resins				8
3740	Pharmaceuticals & Medicines				15
3750	Paint & Varnish	70.5	95.7	100	19
3760	Soap & Cleaning				10
3770	Toilet Preparations				5
3782	Industrial Chemicals (Inorganic)	89.3	99.4	100	21
3783	Industrial Chemicals (Organic)				3

4.2 Crown Corporations

The second focus of this study is crown corporation or public enterprises as they are more normally called. In the last section we looked at concentration in B.C.'s industries from a provincial point of view. While concentration from a federal point of view may not be excessive, concentration from a local point of view may give rise to concern about the local public interests. Concentration plus substantial foreign and out of province ownership may imply loss of control of production and investment levels and rates by market forces or provincial regulation.

In the preceding section and chapters we noted the presence of federal crown corporations in the pivotal sectors of B.C. To the extent that the "interests" of these federal crown corporations differ from those of B.C., their activities could adversely affect B.C.'s economic development. Such could be the case, particularly given that the residence of most directors and officers of these crown corporations is other than that of B.C.

In this report we are concerned neither about the efficiency of public enterprises nor about their political and social objectives. It is also beyond the scope of this report to discuss such matters as principles of optimal pricing and investment. Such matters as marginal cost pricing, public-utility price theory, and peak-load pricing are beyond the scope of this study. Also not considered is the matter of cross-subsidization (except for the Crow rate) with distortions of the pricing mechanism and misallocation of resources, especially of investment resources.

The matter of the Crow Rate and Railway Capacity has already been the subject of a cabinet submission. On February 8th, the federal Minister of Transport announced that:

a) The railways should receive adequate compensation for moving grain, with the framework for the new rates to be established by statute;

b) The federal government will pay an amount, equal to the current shortfall in railway compensation;

c) Grain producers will have to pay an increasing portion of the total cost of moving grain;

d) The railways will be required to provide service quarantees and make commitments to increase capacity.

The position of the B.C. government is support for the federal program to eliminate the Crow Rate.

It is difficult to reach any definitive general conclusions on what should be done about federal crown corporations. The best approach appears to be to tackle them one-by-one, which cannot be done here given time limitations on the completion of this report.

The Committee on Crown Corporations already inquires into the activities of certain B.C. crown corporations. The Committee's concerns are the management, administration and operation of the crown corporations under its jurisdiction.

The Federal Crown Corporations that the B.C. government should presently be the most concerned about are:

a. National Harbours Board
b. Canadian National Railways
c. Petro-Canda
d. National Trading Corporation (Proposed)
e. Canagrex (Proposed)
f. Canadian Development Corporation, and
g. Export Development Corporation.

Provincial Crown Corporations fall under the jurisdiction of one Minister or another. Certain provincial crown corporations also fall under the jurisdiction of the Committee on Crown Corporations. The Minister of Finance is the fiscal agent for provincial crown corporations. Their activities are described in considerable detail in the Financial and Economic Review published by the Ministry of Finance.

Most of B.C.'s crown corporations produce services or products which fall under the decreasing cost category. Crown Corporations and enterprises which do not fall under this category are:

Insurance Corporation of B.C.
British Columbia Petroleum Corporation
Provincial Rental Housing Corporation
Liquor Distribution Branch
British Columiba Cellulose Company

The Liquor Distribution Branch and the British Columbia Petroleum Corporation are operated as fiscal monopolies and are important sources of revenue for the province. I.C.B.C., provides automobile insurance and general insurance; B.C. Cellulose Company, plans for Ocean Falls mill and townsite and evaluation of opportunities for expansion of the wood processing industry in the province, could be classified as a "non-traditional" government enterprises.

Chapter Five: Alternatives

5.1 Policy Options

A government policy pertaining to corporate concentration that enables businesses to adjust to the fundamental dynamics of supply and demand is necessary. These fundamental requirements have to do with supply and demand, industry and business behavior, and market structure. Policies that hinder businesses from attaining real economies that are in line with supply and demand are undesirable.

Government policies have and can take many forms. Such policies include:

1) Merger Policy,
2) Tenure Policy,
3) Tax-Subsidy Policy,
4) Moral Suasion,
5) Price Controls,
6) Public Regulation,
7) Structural Rationalization, and
8) Public Ownership.

There isn't a single policy that works in every circumstance. It is possible to create scenarios in which any of the policies listed above would be appropriate for British Columbia Government in the sense of weighing the costs and benefits to society.

Public ownership, direct regulation, and antitrust (merger) policy are the primary policy options to address corporate concentration. If scale economies allow for the existence of only one company, as B.C. Hydro or B.C. Telephone, either public ownership or direct control of the rate of return based on the average level and structure of prices is typically employed.

The situation is more complex in a high concentration scenario where four enterprises account for the majority of the production capacity due to scale economies.

Since it is unable to enact laws prohibiting non-collusive strategic behavior, antitrust (combines) policies may be ineffectual in such an oligopolistic setting. When it comes to handling collusive and non-competitive practices inside an industry, combines policy works best.

How about controlling prices and/or quantity directly within an industry? Even though strategic interactions between businesses are eliminated, profit maximization by firms would allocate input resources inefficiently when product prices within and between industries do not adjust to market conditions. Additionally, the regulator's prices are not market clearing prices that

balance supply and demand due to either incomplete information or administrative delays. A product will be rationed if its price is lower than its market clearing value because demand will outpace supply. Too high a price will result in overproduction by the industry's firms.

The market structure of British Columbia's industries is influenced by federal government policies, which must be taken into account while evaluating provincial government policy options. Its industrial structure is shaped in part by federal crown corporations, tax and subsidy programs, tariff policies, competition policies, etc.

I will outline each policy and discuss its benefits and drawbacks in the pages that follow. Given the circumstances as outlined in Chapters One, Two, Three, and Four, I will suggest the best policy, or set of policies, in section 5.2.1.

5.1.1 Merger Policy

Merger policy generally limits the degree of concentration directly. Such legislation can take the form:

- No firm in the, for example, electrical products industry shall control more than 25% of the productive capacity;
- No four firms in the electrical industry shall control more than 55% of the productive capacity.

Economists have conducted numerous research to ascertain the highest amount of concentration that is optimal. It is clear from Frederic M. Scherer's book, Industrial Market Structure and Economic Performance (second ed. 1980), that it is extremely difficult to say that businesses less than a certain size don't present monopoly problems or that businesses larger than a certain size might.

Firms merge by exchanging shares, purchasing the shares of another company, or by acquiring productive assets from another company for many reasons other that to obtain a monopoly position in an industry.

To obtain manufacturing and distribution economies, a company may take over another. Recall from Chapter One is that a sizable share of the domestic markets may consist of minimum efficient business sizes. Businesses will have a competitive edge over less efficient businesses if they can achieve adequate productive capacity and the associated market share. At that point, only companies with minimally efficient plant sizes could make enough money to cover their investment.

Other motives for mergers or joint ventures between firms are to pool risk and to utilize complementary managerial, technical, and / or marketing resources. Oliver Williamson of the University of Pennsylvania has been a particularly strong proponent of the cost savings that flow

from a merger. Williamson claims that if the focus in the weighing of social benefits and costs of mergers is "confined to possible cost reductions and the dead-weight welfare losses flowing from monopolistic price raising, modest unit cost savings tend rather quickly to outweigh appreciable price effects."

Merger policy can be enforced through legislation or informally through moral suasion. In Canada, the Combines Investigation act provides for the enforcement of competition legislation with respect to mergers, monopolization including joint-monopolization, and conspiracies in retrain of trade, notably price-fixing and market-sharing agreements.

The Federal Report of the Royal Commission on Corporate Concentration 1979, concluded that:

> While we have recommended a number of improvements, we conclude that no radical changes in the law governing corporate activity are necessary at this time to protect the public interest.

Furthermore, the Commission stated that:

> Competition law should deal in a prohibitory way, with proven anticompetitive conduct only.

The cases that are taken into consideration for adjudication are only tangentially related to the costs and societal benefits of merger policy. The business activities that are discouraged by the restrictions that merger policy places on company takeovers are the true costs and benefits. Very few cases would need to be adjudicated if the policy is working well.

A preliminary review of federal cases indicates that price fixing and horizontal mergers seem to be more of an issue than exclusive dealing, vertical merger, or conglomerate merger.

5.1.2 Tenure Policy

Tenure policy refers to the means devised for conveying rights over Crown resources to industrial users and ultimately to consumers. Prove rights over public resources can be acquired in many ways. The topics of mineral leasing, forest cutting rights, and allocation of fishing rights have received much research and debate.

In British Columbia, forest tenure polity is administered through the Forest Act; mineral tenure policy through the Mineral Act; petroleum and natural gas thought the Petroleum and Natural Gas Act; and coal tenure policy through the Coal Act.

Rights to resources can be transferred via bonus bidding, landlord / tenant arrangements, work commitment bidding, or government involvement in exploration.

Tenure policy can have a substantial impact on the distribution of rights in the province and thereby on the degree and extent of industrial concentration. For example, in the forest sector, the ten top companies held about 44.3% of the committed allowable annual cut in the Public Sustained Yield Units in 1980. The ten largest firms hold 89% of the committed annual cut in Tree-Farm Licences.

The degree of concentration in cutting rights is reflected in the lumber production industry. For example, the 4-firm concentration ratios are 52% and 28% for Coast and Interior lumber production, respectively.

The E.A.R.B. study on corporate concentration in the forest industry concluded:

> The drive for secure cutting rights is the root cause for the extent of integration of different forest product operations into (combined) firms.

It summarized that the control of cutting rights:

> Is the central issue because the present distribution of cutting rights thwarts the establishment of a balanced industry in any of the further processing sectors.

In section 5.2, I shall examine further the issue of tenure policy for the mineral and coal and natural gas sectors.

5.1.3 Tax-Subsidy Policy

Tax-subsidy policy is the most common tool used by the government. The idea is to tax unwanted activities and subsidize desirable ones. In terms of corporate concentration, it is possible to attain the desired level out output by subsidizing the output levels. The accelerated depreciation allowance for mining or oil drilling is one example of this. At the federal level, profits from the extraction and processing of iron ore up to the primary pellet stage is subject to a 25% resource allowance.

However, subsidization is a relatively blunt instrument. To determine the correct level of subsidy or tax, precisely, requires a knowledge of the elasticity of demand and the elasticity of the response of supply. Often, tax-subsidy policy just gives ball park results.

Tariff barriers are typically blamed for any detrimental effects of Canada's oligopolistic sector. If this is the case, lowering tariffs could lessen protection for certain businesses. These businesses would be forced to drop their pricing due to import competition, which would shift monopolistic profits to consumers in the form of lower prices. Although consumers profit from such policies, workers in the protected business do not. Additionally, Canada's balance of payments and exchange rate will suffer from increased imports. Furthermore, there is no

assurance that costs will drop after tariffs are lowered because multinational firms handle a large portion of trade.

5.1.4 Moral Suasion

Moral suasion or jawboning is frequently used by politicians to cover situations where no legislation exists or where regular government channels are too slow to deal adequately with the situation. Jawboning can be backed up by government threats such as denial of government contracts, publicity and consumer boycotts, and the threat of diminishing import and regulatory protection.

Over time, price controllers often base their pricing decisions on unit costs. Long-term unit costs are typically reflected in such unit costs. A price set at this level will result in product at the short run average cost schedule's minimal point since the long run average cost schedule is the envelope of short run average cost schedules.

A company has little motivation to increase its production capacity in order to advance along its long-term average cost schedule once producers and price controllers are locked into such a scenario. It is easy to see the detrimental impact on employment, output, long-term prices, and potential shortages.

5.1.6 Public Regulation

It is often said that regulation occurs because there are well organized vested interests who expect to benefit, and that these beneficiaries are not consumers but producers. Section 3.5 described the various regulatory agencies. The most import regulatory agency from the point of view of economic development is the B.C. Utilities Commission. Whose interests this agency favors, if any, remains open to debate. It is undeniably true that during Commission inquiries, consumers, consumer organizations, environmental organizations, and local interest groups have the chance to present their case.

The thirteen marketing boards, environmental protection organizations, and "watchdog" organizations including the Human Rights Commission, the Rent Review Commission, and the Rentals Man are other significant regulatory bodies.

Marketing boards, like the milk board, control its producers by a combination of inventory holdings, price setting, and entry obstacles. The idea of a fair return on the investment required to produce the product is typically the foundation of such programs.

5.1.7 Structural Rationalization

Referring back to the structure-conduct-performance discussion of Chapter One, structural rationalization could involve a decrease or an increase in the number of producers. It could also involve specialization agreements among firms to limit themselves to certain product lines, and increase or decrease in vertical integration by firms, the formation of export consortia, the formation of conglomerates to internalize certain features of the capital market, the relocation or abandonment of certain plant sites in favour of larger more up-to-date plants.

Generally speaking, these rationalizations are best undertaken in response to market incentives. Regulators and government planners find it challenging to determine the ideal industry structure from the perspective of cost or satisfying consumer demand.

It is crucial to make sure that industrial regulations don't stop structural rationalizations from occurring. Government policies, especially those pertaining to tenure, should not promote excessive concentration at later stages of resource extraction or removal.
Structural rationalization has been discussed from the perspective of resource tenure policy in Section 5.12. Further processing of these resources will surely be concentrated in the hands of a small number of enterprises if there is a high level of concentration at the resource level.

Market forces left to decide the extent of vertical and horizontal integration will not provide a satisfactory industrial structure from the public's point of view if resource tenure regulations allow concentration of lease holdings.

If such a situation already exists, then the only way to obtain an appropriate industry structure is through divesture, the division of the industry along vertical and / or horizontal lines. For example, in the U.S.A., the Senate Judiciary Committee once proposed for consideration by the Senate a divesture bill that would divide the major integrated oi companies into:

1. Exploration and Production,
2. Transportation, and
3. Refining and Marketing

Government policy makers contemplating divesture in an industry should familiarize themselves with the following:

- Oliver E. Williamson, 1975. *Markets and Hierarchies: Analysis and Antitrust Implications*. New York: The Free Press, and
- Wiens, Elmer G., 1979. "Petro-Canada, Antitrust Legislation and Vertical Integration in the Canadian Petroleum Industry." *Center for the Study of Organizational Innovation*, University of Pennsylvania, Discussion Paper #41.

If resource tenure arrangements are overly concentrated, should divestment occur in any of British Columbia's resource-based industries? What kind of industry structure will emerge is a challenging but crucial subject.

In order to solve this problem, two questions need to be addressed:

- Do the businesses in the sector in question have oligopolistic or monopolistic dominance in the home market?
- Does the interconnected nature of these businesses offer any significant efficiencies?

Efficiencies could be due to economies of scale or economies associated with internalizing certain transactions within the firm that might otherwise take place in the market. Since divesture proposes to substitute arms length transactions for internal transactions between divisions, divesture could in fact increase costs and prices.

5.1.8 Public Ownership

A public enterprise is any government-owned and / or controlled unit that produces and sells industrial, commercial, or financial goods and services to the public.

Public finance literature has generally distinguished between two types of public enterprises. The first type are those industries that because of the inelasticity of demand are operated as fiscal monopolies, such as the B.C. Liquor Control Board, providing a source of revenue for the government.

The second type are firms or industries that cannot be operated, both profitably and efficiently, owing to the decreasing cost characteristic of their production function, such as public utilities in power, water, or transportation systems. Here the government may either undertake the production and provision of the god or service, or permit the emergence of a privately owned “natural monopoly” that it regulates. Such activities, even if operated efficiently, may generate losses that must be financed from other sources. This could be the case in decreasing cost industries if marginal cost pricing is enforced by the regulator.

Naturally, this is not the case for government ownership of "nontraditional" businesses, which stand out primarily for their ability to operate profitably and effectively in markets other than those often controlled by fiscal monopolies.

How then should profits of these public enterprises be transferred to the government? Should the be transferred via dividends or through a profits tax? If these enterprises are anticipated to incur a loss, what is the “best” method ensuring loans, or for calculating subsidies?

Understanding how the federal government transfers profits from its businesses to the federal treasury is also crucial. This is relevant since its operations, including investment in British

Columbia, are impacted by federal policies concerning its Crown Corporations. Federal crown corporations give the federal government both monetary and political dividends. Opportunities for cross-subsidization between regions and provinces make the taxation of earnings and any "political" mandates from the federal government—whether directly or through the boards of directors—of utmost importance to British Columbia.

The equal application of a profits tax to both private and public enterprises is important for industrial concentration and growth of crown corporations. If everything else is equal, a company with a tax advantage will expand more quickly and be less affected by fluctuations in the economy.

The growth and profit prospects of public and private firms will differ due to differences in taxation. Additionally, lowering tax rates for public businesses in order to maintain artificially low output prices may permanently prevent private businesses that are subject to higher taxes from entering the market.

Efficient resource usage requires fair and accurate pricing, which is represented in market dynamics. Waste, inefficiency, and unforeseen consequences result from ignoring genuine costs.

5.3 Appendix 1

Table A.1

BRITISH COLUMBIA

PRINCIPAL STATISTICS BY MAJOR GROUP AND INDUSTRY, 1979

								MANUFACTURING ACTIVITY		
			PRODUCTION AND RELATED WORKERS							
CODE	MAJOR GROUP AND INDUSTRY	ESTAB-LISH-MENTS	MALE	FEMALE	MAN HOURS PAID '000	WAGES	COST OF FUEL AND ELEC-TRICITY	COST OF MATERIALS AND SUPPLIES USED $'000	VALUE OF SHIPMENTS OF GOODS OF OWN MANUFACTURE	VALUE ADDED
		NUMBER								
01	FOOD AND BEVERAGE									
101	Meat and Poultry Products Inds	52	1,699	865	5,249	37,422	2,469	320,100	412,092	93,621
1011	Slaughtering & Meat Processors	44	1,265	404	3,466	25,297	1,799	250,872	321,758	70,215
1012	Poultry Processors	8	434	461	1,782	12,125	670	69,228	90,334	23,406
102	Fish Products Industry	61	1,562	1,448	6,212	54,970	3,430	289,269	425,259	144,561
103	Fruit & Veg. Processing Inds	33	728	670	2,947	19,325	1,397	125,814	161,728	47,430
1031	Fruit & Veg. Canners & Preserves	22	451	464	1,927	12,730	723	96,162	120,696	34,016
1032	Frozen Fruit & Vegetable Processors	11	277	206	1,019	6,595	674	29,652	41,032	13,414
104	Dairy Products Industry	27	912	125	1,907	20,812	3,387	221,966	310,533	86,910
105	Flour & Breakfast Cerial Prods Ind	--	--	--	--	--	--	--	--	--
106	Feed Industry	24	409	25	887	7,708	1,034	96,789	117,511	19,475
107	Bakery Products Industries	239	1,072	713	3,559	27,299	1,496	45,972	108,514	61,099
1071	Biscuits Manufacturers	3	31	72	207	1,357	72	4,128	7,640	3,414
1072	Bakeries	236	1,041	641	3,352	25,942	,1425	41,844	100,874	57,685
108	Miscellaneous Food Industries	50	x	x	x	x	x	x	x	x
1081	Confectionery Manufacturers	11	35	71	223	1,267	x	6,016	12,517	6,170
1082	Cake and Beet Sugar Processors	1	x	x	x	x	x	x	x	x
1089	Miscellaneous Food Processors Nes	38	484	359	1,662	12,978	893	172,929	232,483	60,582
109	Beverage Industries	33	x	x	x	x	x	x	x	x
1091	Soft Drink Manufacturers	18	x	x	x	x	x	x	x	x
1092	Distilleries	4	125	67	399	3,843	1,515	16,161	48,064	26,481
1093	Breweries	6	870	14	1,818	19,075	1,761	36,866	100,915	62,844
1094	Wineries	5	155	53	442	3,927	223	21,619	35,408	17,066
Total		519	8,646	4,493	26,718	220,812	19,544	1,402,035	2,064,371	675,458

CODE	MAJOR GROUP AND INDUSTRY	ESTAB-LISH-MENTS	PRODUCTION AND RELATED WORKERS MALE	FEMALE	MAN HOURS PAID '000	WAGES	MANUFACTURING ACTIVITY COST OF FUEL AND ELEC-TRICITY	COST OF MATERIALS AND SUPPLIES USED $'000	VALUE OF SHIPMENTS OF GOODS OF OWN MANUFACTURE	VALUE ADDED
			NUMBER							
02	TOBACCO PRODUCTS INDUSTRIES									
153	Tobacco Products Manufacturers	--	--	--	--	--	--	--	--	--
Total		--	--	--	--	--	--	--	--	--
03	RUBBER AND PLASTICS PRODUCTS INDS									
162	Rubber Products Industries	12	x	x	x	x	x	x	x	x
165	Plastics Fabricating Industry Nes	78	843	215	2,175	15,246	1,151	42,681	81,842	39,554
Total		90	x	x	x	x	x	x	x	x
04	LEATHER INDUSTRIES									
172	Leather Tanneries	1	x	x	x	x	x	x	x	x
174	Shoe Factories	8	x	x	x	x	x	x	x	x
175	Leather Glove Factories	2	x	x	x	x	x	x	x	x
179	Luggage, Handbag etc. Manufacturers	10	34	85	227	1,015	25	2,550	4,733	2,464
1799	Misc. Leather Products Mfrs.	10	34	85	227	1,015	25	2,550	4,733	2,464
Total		21	123	138	517	2,876	x	6,525	11,751	5,642

CODE	MAJOR GROUP AND INDUSTRY	ESTAB-LISH-MENTS	PRODUCTION AND RELATED WORKERS MALE	FEMALE	MAN HOURS PAID '000	WAGES	MANUFACTURING ACTIVITY COST OF FUEL AND ELEC-TRICITY	COST OF MATERIALS AND SUPPLIES USED $'000	VALUE OF SHIPMENTS OF GOODS OF OWN MANUFACTURE	VALUE ADDED
			NUMBER							
05	TEXTILE INDUSTRIES									
181	Cotton Yarn and Cloth Mills	--	--	--	--	--	--	--	--	--
182	Wool Yarn and Cloth Mills	1	x	x	x	x	x	x	x	x
183	Man-Made Fibre, Yarn & Cloth Mills	1	x	x	x	x	x	x	x	x
1832	Throwsters, Spun Yarn & Cloth Mills	1	x	x	x	x	x	x	x	x
184	Cordage and Twine Industry	6	47	18	137	859	37	3,300	6,113	2,838
185	Felt and Fibre Processing Mills	2	x	x	x	x	x	x	x	x
1851	Fibre Processing Mills	1	x	x	x	x	x	x	x	x
1852	Pressed and Punched Felt Mills	1	x	x	x	x	x	x	x	x
186	Carpet, Mat and Rug Industry	1	x	x	x	x	x	x	x	x
187	Canvas Products Cotton & Jute Bags	23	x	x	x	x	x	x	x	x
1871	Cotton and Jute Bags Manufacturers	1	x	x	x	x	x	x	x	x
1872	Canvas Products Manufacturers	22	82	80	319	1,671	34	3,237	7,662	4,301
188	Automobile Fabric Accessories Ind	1	x	x	x	x	x	x	x	x
189	Miscellaneous Textile Industries	31	x	x	x	x	x	x	x	x
1891	Thread Mills	--	--	--	--	--	--	--	--	--
1892	Narrow Fabric Mills	--	--	--	--	--	--	--	--	--
1893	Embroidery, Pleating, Hemstitching	2	x	x	x	x	x	x	x	x
1894	Textile Dyeing & Finishing Plants	1	x	x	x	x	x	x	x	x
1899	Miscellaneous Textile Inds Nes	28	64	311	764	3,826	x	10,220	18,939	8,718
Total		66	261	492	1,533	8,176	239	21,204	41,600	20,196

Source: Statistics Canada. Cat. No. 31-203

CODE	MAJOR GROUP AND INDUSTRY	ESTAB-LISH-MENTS	PRODUCTION AND RELATED WORKERS MALE	FEMALE	MAN HOURS PAID	WAGES	COST OF FUEL AND ELEC-TRICITY	MANUFACTURING ACTIVITY COST OF MATERIALS AND SUPPLIES USED	VALUE OF SHIPMENTS OF GOODS OF OWN MANUFACTURE	VALUE ADDED
			NUMBER		'000			$'000		
06	KNITTING MILLS									
239	Knitting Mills Except Hosiery Mills	6	x	x	x	x	x	x	x	x
2392	Other Knitting Mills	6	x	x	x	x	x	x	x	x
Total		6	x	x	x	x	x	x	x	x
07	CLOTHING INDUSTRIES									
243	Men's Clothing Factories	26	x	x	x	x	x	x	x	x
2431	Men's Clothing Factories	24	182	866	2,173	10,794	x	16,204	35,551	20,422
2432	Men's Clothing Industries	22	x	x	x	x	x	x	x	x
244	Women's Clothing Industries	22	x	x	x	x	x	x	x	x
2441	Women's Clothing Factories	20	113	992	2,008	9,860	153	20,254	45,271	25,979
2442	Women's Clothing Contractors	2	x	x	x	x	x	x	x	x
246	Fur Goods Industry	5	5	7	21	126	x	399	739	463
249	Miscellaneous Clothing Industries	2	x	x	x	x	x	x	x	x
2499	Miscellaneous Clothing Inds Nes	2	x	x	x	x	x	x	x	x
Total		55	319	1,939	4,386	21,593	315	37,594	83,299	47,860
08	WOOD INDUSTRIES									
251	Sawmills, Planing & Shingle Mills	442	33,134	871	69,624	732,057	69,224	2,303,188	3,921,346	1,683,635
2511	Shingle Mills	92	1,522	40	3,223	36,111	1,845	87,569	143,127	53,601
2513	Sawmills & Planing Mills	350	31,612	831	66,400	695,947	67,379	2,215,620	2,778,219	1,630,034
252	Veneer & Plywood Mills	27	6,557	623	13,697	138,621	13,579	346,825	590,658	237,827
254	Sash, Door & Other Millwork Plants	192	2,612	173	5,737	46,213	2,053	149,808	253,301	105,367
2541	Sash, Door & Other Millwork Nes	116	1,651	90	3,578	29,517	1,396	105,453	163,944	60,229

CODE	MAJOR GROUP AND INDUSTRY	ESTAB-LISH-MENTS	PRODUCTION AND RELATED WORKERS MALE	FEMALE	MAN HOURS PAID	WAGES	COST OF FUEL AND ELEC-TRICITY	MANUFACTURING ACTIVITY COST OF MATERIALS AND SUPPLIES USED	VALUE OF SHIPMENTS OF GOODS OF OWN MANUFACTURE	VALUE ADDED
			NUMBER		'000			$'000		
2543	Pre-fabricated Bldgs (Wood Frame)	13	284	5	578	4,465	310	24,212	38,407	13,707
2544	Mfrs of Wooden Kitchen Cabinets	63	677	78	1,580	12,231	346	20,142	50,950	31,431
256	Wooden Box Factories	15	171	11	363	2,839	151	7,402	13,202	5,714
258	Coffin and Casket Industry	4	24	5	60	335	29	895	1,841	975
259	Miscellaneous Wood Industries	37	640	29	1,360	12,233	1,669	31,697	60,358	27,218
2591	Wood Preservation Industry	11	294	10	617	6,218	801	18,558	31,244	12,092
2592	Wood Handles & Turning Industry	5	x	x	x	x	x	x	x	x
2593	Manufacturers of Particle Board	2	x	x	x	x	x	x	x	x
2599	Miscellaneous Wood Industries Nes	19	134	9	282	1,861	x	4,827	8,356	3,458
Total		717	43,138	1,712	90,840	932,299	86,704	2,839,816	4,840,706	2,060,736
09	FURNITURE AND FIXTURES INDUSTRIES									
261	Household Furniture Manufacturers	167	x	x	x	x	x	x	x	x
2611	Furniture Re-Upholstery & Repair	99	x	x	x	x	x	x	x	x
2619	Household Furniture Mfrs Nes	68	435	118	1,142	6,622	134	15,730	32,114	16,382
264	Office Furniture Manufacturers	8	x	x	x	x	x	x	x	x
266	Misc. Furniture & Fixutre Mfrs	28	395	65	944	7,518	267	13,867	31,209	17,622
268	Electric Lamp and Shade Mfrs	4	33	14	97	576	x	825	1,822	970
Total		207	1,319	270	3,277	21,252	x	39,397	82,750	43,597
10	PAPER AND ALLIED INDUSTRIES									
271	Pulp and Paper Mills	24	12,743	469	26,789	306,004	188,298	896,443	2,324,219	1,242,569
272	Asphalt Roofing Manufacturers	3	x	x	x	x	x	x	x	x
273	Paper Box & Bag Manufacturers	23	1,215	262	3,063	27,276	x	98,696	169,668	68,781

MANUFACTURING ACTIVITY

CODE	MAJOR GROUP AND INDUSTRY	ESTAB-LISH-MENTS	PRODUCTION AND RELATED WORKERS MALE	FEMALE	MAN HOURS PAID	WAGES	COST OF FUEL AND ELEC-TRICITY	COST OF MATERIALS AND SUPPLIES USED	VALUE OF SHIPMENTS OF GOODS OF OWN MANUFACTURE	VALUE ADDED
			NUMBER		'000			$'000		
2731	Folding Carton & Set-Up Box Mfrs	5	281	79	748	6,846	x	23,104	40,002	16,942
2732	Corrugated Box Manufacturers	7	645	70	1,484	13,600	937	45,557	78,969	30,848
2733	Paper & Plastic Bag Manufacturers	11	289	113	831	6,830	511	30,035	50,697	20,990
274	Miscellaneous Paper Converters	24	x	x	x	x	x	x	x	x
Total		74	14,256	814	30,632	338,920	190,541	1,021,310	2,537,492	1,328,426
11	PRINTING, PUBLISHING & ALLIED INDS.									
286	Commerical Printing	219	1,581	554	4,189	36,285	625	51,916	130,399	77,703
287	Platemaking, Typesetting Etc. Ind	31	326	42	695	6,180	67	3,643	13,708	10,017
288	Publishing Only	81	--	--	--	--	--	14,754	30,878	16,203
289	Publishing & Printing	83	1,913	523	4,788	36,460	969	38,001	134,784	95,921
Total		414	3,820	1,119	9,672	78,925	1,662	108,314	309,769	199,844
12	PRIMARY METAL INDUSTRIES									
291	Iron and Steel Mills	4	677	1	1,417	11,751	3,200	21,234	45,526	22,935
292	Steel Pipe & Tube Mills	3	x	x	x	x	x	x	x	x
294	Iron Foundries	10	516	10	1,079	9,085	541	10,271	32,188	22,699
295	Smelting & Refining	5	x	x	x	x	x	x	x	x
296	Aluminum Rolling, Casting etc.	4	x	x	x	x	x	x	x	x
297	Copper & Copper Alloy Rolling etc.	4	x	x	x	x	x	x	x	x
298	Metal Rolling, Casting etc Nes	11	128	2	269	2,053	299	14,723	25,637	13,004
Total		41	6,247	193	13,949	125,610	15,420	319,781	702,965	375,298

MANUFACTURING ACTIVITY

CODE	MAJOR GROUP AND INDUSTRY	ESTAB-LISH-MENTS	PRODUCTION AND RELATED WORKERS MALE	FEMALE	MAN HOURS PAID	WAGES	COST OF FUEL AND ELEC-TRICITY	COST OF MATERIALS AND SUPPLIES USED	VALUE OF SHIPMENTS OF GOODS OF OWN MANUFACTURE	VALUE ADDED
			NUMBER		'000			$'000		
13	METAL FABRICATING INDUSTRIES									
301	Boiler and Plate Works	5	63	1	131	1,179	x	1,650	3,229	1,716
302	Fab. Structural Metal Industry	34	1,306	1	2,704	26,500	942	56,285	108,640	46,311
303	Ornamental & Architectural Metal	81	888	112	1,996	15,671	634	40,395	78,398	38,080
3031	Metal Door & Window Manufacturers	33	637	97	1,494	11,514	510	31,543	60,085	28,682
3039	Ornament & Architectural Metal Nes	48	251	15	502	4,157	125	8,852	18,312	9,398
304	Metal Stamping Pressing & Coating	97	1,205	68	2,685	23,858	900	93,125	149,207	57,356
3041	Metal Coating Industry	17	180	14	416	2,916	111	2,387	7,439	4,940
3042	Metal Stamping & Pressing Ind	80	1,025	54	2,269	20,942	789	90,739	141,768	52,417
305	Wire & Wire Products Mfrs	29	1,005	105	2,280	19,322	1,621	65,521	121,708	57,073
3051	Fastener Manufacturers	2	x	x	x	x	x	x	x	x
3059	Wire & Wire Products Mfrs Nes	27	x	x	x	x	x	x	x	x
306	Hardware, Tool & Cutlery Mfrs	32	913	520	2,993	22,242	826	28,946	83,467	54,147
307	Heating Equipment Manufacturers	10	133	7	287	2,178	96	6,288	12,238	6,063
308	Machine Shops	153	1,464	57	3,119	25,829	x	31,012	84,702	55,233
309	Misc Metal Fabricating Inds	65	678	23	1,452	11,185	565	25,175	46,653	22,239
Total		506	7,655	894	17,647	147,964	6,498	348,398	688,241	338,219
14	MACHINERY INDUSTRIES									
311	Agricultural Implement Industry	4	25	2	56	393	11	2,213	2,924	975
315	Misc Machinery & Equipment Mfrs	138	3,985	120	8,415	79,524	2,867	181,229	374,486	192,034
316	Commercial Refrig Air Cond Mfrs	2	x	x	x	x	x	x	x	x
318	Office & Store Machinery Mfrs	6	x	x	x	x	x	x	x	x
Total		150	4,134	185	8,856	82,870	2,941	186,701	386,543	199,133

CODE	MAJOR GROUP AND INDUSTRY	ESTAB-LISH-MENTS	PRODUCTION AND RELATED WORKERS MALE	FEMALE	MAN HOURS PAID '000	WAGES	MANUFACTURING ACTIVITY COST OF FUEL AND ELEC-TRICITY	COST OF MATERIALS AND SUPPLIES USED $'000	VALUE OF SHIPMENTS OF GOODS OF OWN MANUFACTURE	VALUE ADDED
			NUMBER							
15	TRANSPORTATION EQUIPMENT INDUSTRIES									
321	Aircraft & Aircraft Parts Mfrs	21	217	8	460	3,873	59	5,148	13,159	7,709
323	Motor Vehicle Manufacturers	4	1,877	112	4,041	34,909	613	192,244	325,458	133,868
324	Truck Body & Trailer Mfrs	54	1,634	118	3,600	26,590	749	102,444	158,279	57,124
3241	Truck Body Manufacturers	19	308	2	648	4,968	119	9,781	18,482	8,804
3242	Non-Commercial Trailer Mfrs	29	1,009	114	2,290	15,996	437	75,188	110,591	36,439
3243	Commercial Trailer Manufacturers	6	317	2	662	5,626	194	17,475	29,206	11,880
325	Motor Vehicle Parts & Accessories	20	x	x	x	x	x	x	x	x
327	Shipbuilding & Repair	24	3,025	14	6,240	71,281	1,580	80,690	189,658	115,832
328	Boatbuilding & Repair	99	772	44	1,698	12,602	171	24,258	47,023	24,050
329	Miscellaneous Vehicle Manufacturers	1	x	x	x	x	x	x	x	x
Total		223	7,770	304	26,561	153,493	3,357	412,887	752,292	349,116
16	ELECTRICAL PRODUCTS INDUSTRIES									
331	Mfrs of Small Electrical Appliances	2	x	x	x	x	x	x	x	x
332	Manufacturers of Major Appliances	6	35	3	80	456	x	954	1,770	817
333	Manufacturers of Lighting Fixtures	12	91	56	288	1,569	97	6,183	11,6545	5,647
335	Communications Equipment Mfrs	37	430	416	1,753	11,939	222	21,631	54,842	33,356
336	Mfrs Electrical Industrial Equip	20	300	29	666	5,416	124	15,272	31,240	15,927
338	Mfrs of Electric Wire & Cable	3	235	21	524	4,578	380	32,650	48,784	16,007
339	Mfrs of Misc Electrical Products	7	x	x	x	x	x	x	x	x
3391	Battery Manufacturers	5	107	5	224	1,773	169	7,887	13,924	6,270
3399	Mfrs Misc Electrical Products Nes	2	x	x	x	x	x	x	x	x
Total		87	1,238	532	3,623	26,215	1,022	85,321	164,352	79,242

CODE	MAJOR GROUP AND INDUSTRY	ESTAB-LISH-MENTS	PRODUCTION AND RELATED WORKERS MALE	FEMALE	MAN HOURS PAID '000	WAGES	MANUFACTURING ACTIVITY COST OF FUEL AND ELEC-TRICITY	COST OF MATERIALS AND SUPPLIES USED $'000	VALUE OF SHIPMENTS OF GOODS OF OWN MANUFACTURE	VALUE ADDED
			NUMBER							
17	NON-METALLIC MINERAL PRODUCTS INDS									
351	Clay Products Manufacturers	15	x	x	x	x	x	x	x	x
3511	Clay Products Mfrs (Domestic Clays)	9	x	x	x	x	x	x	x	x
3512	Clay Products Mfrs (Imported Clays)	6	x	x	x	x	x	x	x	x
352	Cement Manufacturers	4	x	x	x	x	x	x	x	x
353	Stone Products Manufacturers	10	38	--	71	461	x	484	1,125	638
354	Concrete Products Manufacturers	53	459	5	982	9,413	783	14,479	39,494	26,569
3541	Concrete Pipe Manufacturers	5	x	x	x	x	x	x	x	x
3542	Mfrs Structural Concrete Products	1	x	x	x	x	x	x	x	x
3549	Concrete Products Mfrs Nes	47	x	x	x	x	x	x	x	x
355	Ready-Mix Concrete Manufacturers	77	978	9	2,045	21,694	2,926	61,801	105,173	40,743
356	Glass & Glass Products Mfrs	10	x	x	x	x	x	x	x	x
3561	Glass Manufacturers	2	x	x	x	x	x	x	x	x
3562	Glass Products Manufacturers	8	16	2	36	287	x	905	1,525	614
358	Lime Manufacturers	2	x	x	x	x	x	x	x	x
359	Misc Non-Metallic Mineral Products	12	279	19	627	6,063	x	20,080	44,402	21,97
3591	Refractories Manufacturers	1	x	x	x	x	x	x	x	x
3599	Misc Non-Metallic Mineral Prods Nes	11	x	x	x	x	x	x	x	x
Total		183	2,765	281	6,369	64,570	31,401	131,018	340,298	181,060
18	PETROLEUM AND COAL PRODUCTS INDS									
365	Petroleum Refineries	8	x	x	x	x	x	x	x	x
3651	Petroleum Refining	7	x	x	x	x	x	x	x	x
3652	Mfrs Lubricating Oils & Greases	1	x	x	x	x	x	x	x	x
369	Misc Petroleum & Coal Prods Inds	3	x	x	x	x	x	x	x	x
Total		11	776	4	1,656	17,982	13,609	920,392	1,069,370	145,815

			PRODUCTION AND RELATED WORKERS				MANUFACTURING ACTIVITY			
CODE	MAJOR GROUP AND INDUSTRY	ESTAB-LISH-MENTS	MALE	FENALE	MAN HOURS PAID '000	WAGES	COST OF FUEL AND ELEC-TRICITY	COST OF MATERIALS AND SUPPLIES USED $'000	VALUE OF SHIPMENTS OF GOODS OF OWN MANUFACTURE	VALUE ADDED
			NUMBER							
19	CHEMICAL & CHEMICAL PRODUCTS INDS									
372	Manufacturing of Mixed Fertilizers	4	x	x	x	x	x	x	x	x
373	Mfrs of Plastics & synthetic Resins	6	x	x	x	x	x	x	x	x
374	Mfrs Pharmaceuticals & Medicines	8	55	41	197	1,182	x	4,923	9,353	4,576
375	Paint & Varnish Manufacturers	17	234	47	571	4,469	311	35,996	67,094	32,023
376	Mfrs of Soap & Cleaning Compounds	6	60	19	162	1,215	x	3,242	5,512	2,297
377	Mfrs of Toilet Preparations	5	7	5	26	146	x	373	618	229
378	Mfrs of Industrial Chemicals	19	675	--	1,449	14,246	22,994	71,564	202,351	115,490
3782	Industrial Chem (Inorganic) Nes	17	x	x	x	x	x	x	x	x
3783	Industrial Chemicals (Organic) Nes	2	x	x	x	x	x	x	x	x
379	Miscellaneous Chemical Industries	38	x	x	x	x	x	x	x	x
3791	Manufacturers of Printing Inks	5	x	x	x	x	x	x	x	x
3799	Miscellaneous Chemical Inds Nes	33	131	25	324	2,554	228	17,437	30,777	13,226
Total		103	1,297	138	3,020	26,305	24,126	170,040	363,582	179,257
20	MISCELLANEOUS MANUFACTURING INDS									
391	Scientific & Professional Equipment	151	821	322	2,321	14,392	71	14,661	34,671	19,996
3911	Instrument & Related Products Mfrs	17	x	x	x	x	x	x	x	x
3912	Clock & Watch Manufacturers	3	x	x	x	x	x	x	x	x
3913	Ortho. & Surgical Applicance Mfrs	3	x	x	x	x	x	x	x	x
3914	Ophthalmic Goods Manufacturers	17	165	66	468	2,736	62	5,912	10,245	4,329
3915	Dental Laboratories	111	603	243	1,726	10,786	--	7,212	20,872	13,660
392	Jewellery & Silverware Industry	36	108	53	336	2,388	26	4,066	8,918	4,824