The Regional Impact of the Canadian Tariff

Hugh McA Pinchin

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ECONOMIC COUNCIL OF CANADA

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Preface

What do we know about how the tariff affects the different regions of Canada? And what do we need to know for Canada to participate in the current round of international trade negotiations directed towards reducing or ultimately removing the tariff? These are the questions that prompted me to undertake this study, which originated in background research for the examination of Canadian commercial policy by the Economic Council of Canada [*Looking Outward: A New Trade Strategy for Canada* (Ottawa: Information Canada, 1975)].

The principal contributions of my work are found in Chapters 3 and 4, where a hypothetical policy of tariff removal is introduced to derive the regional impact of the tariff from the regional distribution of production and consumption of manufactured goods in 1970. Chapter 3 presents a static analysis of the cash costs of the tariff to final users and the size of the interregional tariff transfers from users in one region to producers in another. The estimates of the cash costs of the tariff are somewhat smaller than those normally assumed. While the regional distribution of the tariff transfers confirms the generally held view, the balance of regional transfers is shown to have swung in Quebec's favour since the Second World War. In Chapter 4, the hypothesized removal of the Canadian tariff is used to estimate the regional distribution of manufacturing employment that is directly and indirectly dependent upon the tariff. This exercise is carried out at the three-digit industry level using both ad valorem and effective tariff rates.

Since this study has been in preparation for so long, interest in it will likely focus on the differences in the magnitude of the initial impact of tariff removal compared with the results presented in the Economic Council's report. Chapter 5 reviews the basis for these differences and contrasts the regional effects of unilateral tariff removal with those of some other policies for freer trade that are open to Canada. It concludes that, whatever policy option is adopted, the disproportionate burden of adjustment in the manufacturing sector of Quebec will require special attention. Chapter 2 marshals the vast amount of regional data necessary for this undertaking and provides a framework for the static aspects of the analysis. Chapter 1 and the related appendix look back over one hundred years of protection in Canada to provide a perspective on changes in regional trading strengths and in the regional impact of the

tariff. Although more superficial than the static impact analysis, the dynamic evidence in Chapter 1 suggests that further concentration of Canada's manufacturing in Ontario would be the likely outcome if changes in tariff policy were not accompanied by an active policy of regional development.

Before proceeding, I should like readers to know that without the aid and encouragement of I. H. Midgley, I could not have undertaken this task. I am also grateful to many others, including readers for the Economic Council of Canada who provided me with critical insights and assistance along the way. Of them, I would especially like to thank R. Zuker, B. K. Lodh, G. Lavoie, and D. Nelles.

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1 The Historical Perspective, 1870-1970

The current pattern of regional specialization and trade in manufactured goods within Canada emerged during an era of high-tariff protection. Although the analytical focus of this study is upon the regional implications of a contemporary decision to eliminate the Canadian tariff, it is appropriate to reflect briefly on some of the broad historical effects of one hundred years of protection. This introductory chapter quickly reviews the circumstances behind the principal changes in Canada's tariff legislation and presents a tendentious interpretation of the role the tariff has played in concentrating Canada's manufacturing sector within the two central regions. While this diagnosis is based upon the empirical work detailed in Appendix A, it should be stressed at the outset that any speculation about what might have happened — or, for that matter, what will happen — in the absence of the tariff is bound to be controversial.

The long-run implications of removing the Canadian tariff might, of course, depend upon the size and distribution of the short-run effects analysed in this study, but this need not be the case. The data and the analytical framework used in later chapters are essentially relevant for examination of the short-run impact. The insights into the long-run dynamics of regional adaptation to tariff removal are taken from Appendix A. Fundamental to the historical sections of this study are the assumptions that Canada without its tariff would have escaped absorption by the United States and that U.S. tariff policy towards Canada would not have been substantially different in the absence of the Canadian tariff.

Tariff Policy and Changes in the Direction of Canadian Trade

Canada's first tariff — the Dominion Tariff of 1868 — was a sensitive compromise between the high-tariff interests of the two central regions of Ontario and Quebec and those regions that advocated free trade. The central Canadian manufacturing industries still, however, proved unequal to the competitive pressures emanating from the United States during the 1870s. While the Civil War had stimulated manufacturing in Canada, the restoration of peace brought the abrogation of the 1854 Treaty of Reciprocity and the onset of a totally new form of

competition from industrial centres across the border.[1] Industrial distress, emigration, and mounting concern over a more general sociopolitical threat from the United States created political pressure in Canada for the acceptance of a new policy of defensive expansionism.[2] The National Policy, adopted in 1879, sought to assist urban industrial expansion and to foster western settlement and the building of an independent east-west transportation system. This high-tariff policy was introduced as the essential link that would bind together the three elements of this development plan and ensure its ultimate viability.

The pattern of interregional trade and specialization that developed in the first two decades of the National Policy has not changed substantially to the present day. While manufacturing industries in Ontario and Quebec had enjoyed some protection since the 1850s and these central regions had built up a substantial urban infrastructure in the mercantile era, within the new high-tariff union their initial advantage, geographic location, and specially contrived tariff loopholes[3] guaranteed that they would reap the benefits from any import substitution. Tariffs were known to be equivalent to increased transportation costs on manufactured imports, and the logic of distance soon came to dictate that Canada's industrial expansion would occur at the centre rather than at the periphery of the protected area. The National Policy secured a hinterland for the manufactures of central Canada, providing markets and to a lesser extent raw materials. The degree to which manufacturing became concentrated in Ontario between 1880 and 1910 — a period of rapid industrialization — and stabilized thereafter is shown in Table 1-1. A disaggregated analysis of trends in the location of particular manufacturing industries (see Appendix A) leaves little doubt that the Canadian tariff enhanced the size and concentration of manufacturing in Ontario. Given the deleterious effects of the U.S. tariff, the Canadian tariff played an essential role in the rapid growth of the manufacturing centres in central Canada. The opening of the west, resource discoveries, changes in population, technology, and in the direction of external trade and foreign investment flows sustained the advantage of central Canada's urban centres while gradually shifting the centre of the industrial heartland westward.

1 In 1870, Chicago, Pittsburg, Cleveland, and Detroit combined only accounted for a population of 250,000; yet between 1860 and 1890, the proportion of the population engaged in manufacturing in these centres rose from 5 to 20 per cent, and their contribution to manufacturing value added in the United States rose from 1.0 to 9.9 per cent. A. Pred, *The Spatial Dynamics of U.S. Urban Industrial Growth, 1800-1915* (Cambridge: M.I.T. Press, 1966), pp. 22-23.

2 H.G.J. Aitken, "Canada: Defensive Expansionism," in H.G.J. Aitken (ed.), *The State and Economic Growth* (New York: Social Science Research Council, 1959); and J. Friedman, "A General Theory of Polarized Development," mimeographed, 1967.

3 W. A. Mackintosh, *The Economic Background of Dominion-Provincial Relations* (Toronto: McClelland and Stewart, 1964), p. 60.

Table 1-1

Index of Concentration of Manufacturing Industries,[1] by Region, 1880-1969

	1880	1910	1915	1969
Atlantic	0.67	0.58	0.63	0.36
Quebec	1.03	1.03	1.04	0.98
Ontario	1.16	1.45	1.53	1.53
Prairies	0.43	0.34	0.32	0.40
Pacific	1.09	1.14	0.85	0.85
Canada	1.00	1.00	1.00	1.00

1 This index is simply a location quotient, the ratio of manufacturing value added per capita in a region to that in the country as a whole.

Source: See Appendix A and Tables A-12 through A-16.

Changes in U.S. tariff policy and the growing dependence of Canada on merchandise and capital imports from the United States have from the start represented the most important determinants of Canadian tariff legislation. The principal alterations in the tariff legislation of the two countries are outlined in Table 1-2.[4] The growth of Canadian dependence on imports from the United States rather than from Europe is illustrated in Chart 1-1. The increase in reliance on U.S. imports was retarded by the National Policy tariffs, but still rose from 35 per cent to 60 per cent between 1870 and 1900. After the boom period of the First World War in which this dependence soared, Canada's manufacturing growth failed to keep pace with that in the United States and, as in the 1870s, the result was a rapid rate of migration to the urban centres of the United States. Canada was, however, quick to raise tariffs and other barriers in response to the predepression passage of the Hawley-Smoot Law, sharply reducing its trade dependence on the United States and heralding a new era in which Canadian protectionism was consciously designed to attract foreign subsidiaries (tariff factories) into the country.[5] These market-oriented subsidiaries then, as now, had a strong proclivity to settle in Ontario, further enhancing the concentration of Canada's manufacturing sector in this region. Recent transportation improvements and the growth of intracorporate trade, especially following the subsidiary boom of the

4 The degree to which the U.S. tariff deterred the development of secondary resource-processing for the U.S. market depended upon effective rather than nominal rates of protection, and the effective rates were usually prohibitive.

5 H. Marshall, F. A. Southard and K. W. Taylor, *Canadian-American Industry: A Study in International Investment* (New Haven: Yale University Press, 1936); H.G.J. Aitken, *American Capital and Canadian Resources* (Cambridge: Harvard University Press, 1961).

Table 1-2

Average Rates of Duty on Imports from all Countries by Principal Tariff Legislation, Canada and the United States, 1865-1970

	Legislation	Equivalent ad valorem rate on		Proportion of imports entering free
		Dutiable imports	Total imports	
			(Per cent)	
Canada				
1869-74	Dominion tariff	19.5	12.6	35.3
1875-79	Mackenzie tariff	21.2	14.2	33.4
1880-87	National policy	26.2	19.8	24.2
1888-90	1887 Amendment	31.6	21.7	31.2
1891-97	Conservative tariffs	30.5	19.0	37.7
1898-07	Fielding's 1st tariff	27.7	16.7	39.7
1908-14	2nd tariff	26.4	16.8	36.7
1914-21[1]		24.1	15.7	35.0
1922-30	Liberal Progressive tariffs			
1931-35	R.B. Bennett tariffs	28.5	17.6	38.2
1936-41	Canada-U.S. trade agreements	24.2	13.2	45.7
1942-51				
1952-60	GATT	17.8	10.2	42.5
1961-70	GATT	16.7	8.2	51.2
United States				
1865-70[2]	Act of 1864	48	44	8
1871-72	Act of 1870	43	38	8
1873-75	Act of 1872	39	27	27
1876-83	Act of 1872 repealed 1875	43	29	31
1884-90	Act of 1883	45	30	33
1891-94	McKinley law	48	23	52
1895-97	Wilson law	41	21	49
1898-09	Dingley law	47	26	44
1910-13	Payne-Aldrich law	41	19	52
1914-22	Underwood law	27	9	66
1923-30	Fordney-McCumber law	39	14	64
1930-33	Hawley-Smoot law	53	18	66
1934	Trade Agreements Act	47	18	61
1935-39	Trade Agreements Act	39	16	59
1940-48	Trade Agreements Act	25	9	63
1949-59	Trade Agreements Act	12	6	51
1960-70	Trade Expansion Act	12	7	37

1 Direct controls had far more to do with the direction of trade in wartime than tariffs.
2 This figure includes two years of reciprocity 1865 and 1866 when the proportion of tariff-free imports was 19 and 13 per cent, respectively.

Sources: U.S. Department of Commerce, *Historical Statistics of the United States, Colonial Times of 1957,* Series U 15-20 (Washington, D.C.: U.S. Government Printing Office, 1960), p. 539; U.S. Department of Commerce, *Statistical Abstract of the United States,* 86th ed. (Washington, D.C.: U.S. Government Printing Office, 1965), p. 890; D.D. Humphrey, *American Imports* (New York: Twentieth Century Fund, 1955), p. 74; Dominion Bureau of Statistics, *Trade of Canada* (Ottawa) various years.

Chart 1-1

Imports from the United States as a Proportion of Total Canadian Imports, 1870-1970

1950s and 1960s, have increased even more the locational advantages of Ontario over Quebec.[6]

The realities of federal politics in Canada made it apparent as early as 1910 that some reduction in the assistance given to manufacturing in central Canada, or at least some subsidization of other regions to offset the deleterious effects of protection, was required.[7] As a compromise, some tariffs were lowered and a range of subsidies was made available to other regional interests. Mounting political concern in the 1930s over

6 Of 1,618 U.S. subsidiaries located in Canada in 1960, 1,132 were located in Toronto and southwestern Ontario, while only 187 were situated in Montreal. See U.S. Department of Commerce, *American Firms, Subsidiaries and Affiliates in Canada* (Washington, D.C., 1962). The imbalance in the location of market-oriented subsidiaries may be inferred from regional shares of taxable income of Canadian- and foreign-owned corporations. For example, in 1970, Ontario's share of taxable income from domestically owned corporations was 47.47 per cent of the Canadian total and from foreign subsidiaries was 56.40. Quebec's share was 28.83 and 24.18, respectively. Shares in the other three regions were drastically lower. See Statistics Canada, *Corporations and Labour Unions Returns*, 1970, Cat. no. 61-210 (March 1973), pp. 198-203.

7 When National Policy was introduced, Canada was following the example not only of the United States, but also of France and "Germany." Institutional factors precluded resort to more efficient policies of assistance to manufacturing based upon tax breaks and subsidies. Canadian governments were dependent upon excise taxes for revenue and were always in financial difficulties. But even if revenues had been available, as they were after the introduction of direct taxation in 1915, subsidies comparable to those derived from the tariff would have introduced intolerable political strains on an already tenuous Confederation.

regional income inequalities associated with unbalanced industrial structures in the other regions was set aside during the Second World War.[8] In the postwar period, however, earlier anxieties over disparities among the regions were rekindled as tariffs were reduced. In addition, the Auto Pact whose provisions mainly benefitted Ontario, exacerbated regional tensions over commercial policy. The establishment in the late 1960s of a federal department devoted to regional affairs represented, among other things, a national commitment to try to spread manufacturing across the country. Whether the removal of the Canadian tariff would advance or retard this goal is now an important political issue. To a considerable extent the answer depends upon the degree to which past tariff policies, combined with other determinants of urbanization, have built cumulative and irreversible characteristics into the current regional structure of Canadian manufacturing.

Regional Costs and Benefits of the Tariff

While the static costs and benefits and the dynamic repercussions of one hundred years of protection cannot be measured, one can offer some reasonably well-founded generalizations. It is clear that all regions have had to pay the static costs of the Canadian tariff, and that the bulk of them have represented a hidden transfer to the producers of protected manufactured goods located in Ontario and Quebec. This conventional type of reasoning lends itself to more precise quantification.[9] From estimates of the markup resulting from the protection of domestically produced and consumed goods for each industry, the size and distribution of the interregional transfers attributed to the tariff can readily be approximated. Broadly, the costs depend on the regional distribution of income, while the transfers vary according to the location of production. The excess costs and interregional transfers resulting from the tariff in specific years during the past century were estimated on the basis of a "shipments approach" using a 17-industry breakdown of manufacturing shipments, assuming that the tariff "markup" for each industry is equal to the relevant ratio of duties to total imports.

The gross cash cost of the tariff — that is, the gross markup paid by all Canadians as a result of the tariff — consists of two parts: that transferred to the government as duty on foreign imports, and that

8 Royal Commission on Dominion-Provincial Relations, *Report*, Rowell-Sirois Report (Ottawa: King's Printer, 1940).

9 This is a simplified form of the detailed "final demand" analysis in Chapter 3. That analysis leads to somewhat different and more reliable numerical conclusions from those derived in this section. There has always been some question in the literature whether regional collectivities are appropriate units for this type of analysis when factors of production are mobile between regions. When there are cumulative aspects to regional development as suggested later in this chapter — that is where success breeds success and failure breeds failure — the perspective of regional governments becomes more respectable.

transferred to Canadian producers.[10] Estimates of this cost, espressed as a share of personal incomes are presented in Table 1-3. Gross cash cost shares vary with the pattern of demand, the height and prohibitiveness of the tariff, and the importance of protected manufactures in total expenditures. The decline of the gross cash cost share of personal incomes from 11 per cent in 1890 to 6.8 per cent in 1969 reflects changes in each of these elements. For instance, the drop between 1959 and 1969 incorporates not only the effect of tariff reductions, but also the results of an increased proportion of expenditures on services, as well as the effect of the Auto Pact and the voluntary export restraint program in textiles.

Table 1-3

Gross Cash Cost of the Tariff,[1] 1890-1969

	Federal duty	Subsidy to domestic producers	Gross cash cost
	(Per cent of personal income)		
1890	2.98	8.08	11.06
1910	3.53	5.87	9.40
1926	3.87	6.43	10.30
1939	2.21	7.93	10.14
1949	1.79	7.08	8.87
1959	2.13	7.00	9.13
1969	1.44	5.32	6.76

1 These figures do not take into account that removal of the tariff would necessitate a devaluation of the currency.

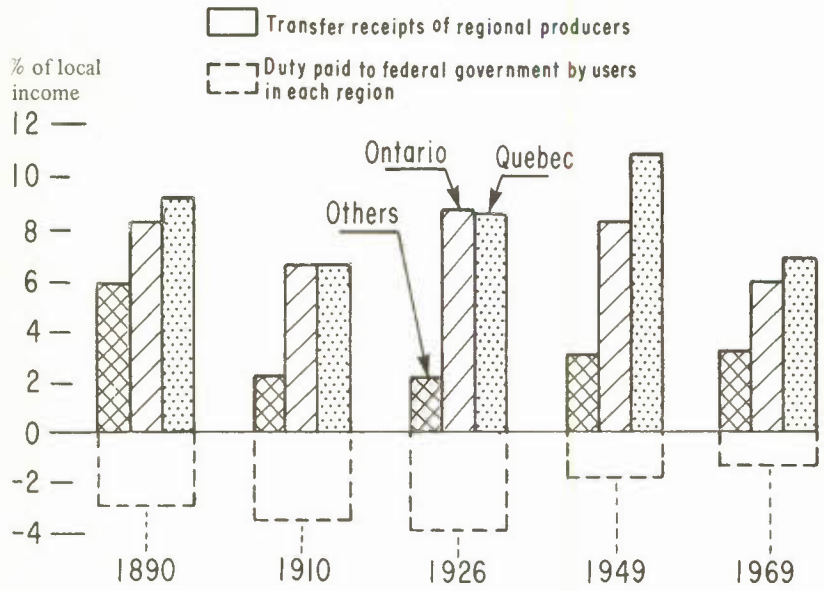
Source: See Appendix B.

To estimate the annual interregional tariff transfers between Quebec, Ontario, and the rest of Canada that can be attributed to the subsidy component of the tariff, it was first necessary to develop some proxies for unavailable data. The method of estimating the region of origin of exports, the region of destination of imports, and the interregional flow of manufactured goods, by industry, are explained in Appendix B. The resulting estimates of interregional tariff transfers are shown in Chart 1-2 and Table 1-4. They uphold the traditional belief that the tariff has always been associated with large transfers towards central Canada and imply that the tax levied upon the rest of the country rose as a percentage of local incomes until 1926, declining substantially only in recent years; the transfer receipts of local producers outside central Canada have been rising as a proportion of local incomes since 1926.

10 These transfers, of course, introduce additional welfare costs that are not encompassed by these calculations.

Chart 1-2

Tariff Transfers to Local Producers and Federal Duty Paid, by Region, 1890-1969



Source: See Appendix A.

Table 1-4

Estimates of Net Interregional Tariff Transfers, 1890-1969

	Quebec	Ontario	Others	Quebec	Ontario	Others
	(Millions of current dollars)			(Per cent of local personal income)		
1890	2.3	1.7	-4.0	1.1	0.4	-2.1
1910	8.5	15.0	-23.5	1.8	1.8	-3.2
1926	22.2	39.5	-61.7	2.4	2.6	-4.0
1949	111.0	71.2	-182.2	3.6	1.5	-3.9
1969	231.6	170.0	-401.6	1.5	0.7	-2.0

Source: See Appendix B.

In view of the assertion that Ontario was the principal beneficiary of the tariff, it is perplexing to find that that province received the largest dollar amounts of the tariff transfers only for some time between 1890 and 1949; tariff transfers represented a larger percentage of local income in Quebec in each year except 1910 and 1926. Since domestic excise taxes on tobacco produced or processed in Canada offset much of the markup on imported tobacco, there is reason to believe that Quebec's transfer receipts, as calculated, incorporate a large upward bias because of its early dominance of this industry. Since the Second World War, however, Quebec has clearly been the major recipient of tariff transfers, because negotiated tariff reductions have applied to industries that by now are located predominantly in Ontario (see Appendix A).

In *Looking Outward*, the Economic Council is quick to dismiss the current tariff transfers in favour of Ontario and Quebec because of the offsetting dynamic burden that the tariff now involves for these provinces,[11] but in the past these annual transfers have been associated with a variety of dynamic advantages for the development of central Canada. Among the beneficial results of tariff markups and import substitution in these regions are the possibilities of increased employment opportunities and in-migration; the attraction and retention of capital and the generation of increased savings; the stimulation of industries with strong linkages into the local resource base; the propagation of economies of scale and external economies; and urbanization and enhanced viability of existing urban agglomerations.

Even though it may be possible to show that per capital incomes would have been higher in Canada without the tariff, it would still be apparent that the tariff was associated with increased employment opportunities and levels of investment in central Canada. Protection of manufacturing raised wages and the returns to capital at the expense of returns to land resources. Job opportunities in central Canada resulting, directly and indirectly, from tariff protection attracted migrants from the rest of Canada and from Europe, but they also offset, to a large degree, the pull of industrial centres in the United States.[12] In like manner, profit

11 "According to this line of reasoning, the central provinces could be said to benefit from the tariff. However, if a dynamic view is adopted... such a conclusion is erroneous." Economic Council of Canada, *Looking Outward: A New Trade Strategy for Canada* (Ottawa: Information Canada, 1975), p. 43.

12 L. Truesdell, *The Canadian Born in the U.S.: An Analysis of the Statistics of the Canadian Element in the Population of the United States, 1850-1930* (New Haven: Yale University Press, 1943). R. E. Caves and R. H. Holton argue, in *The Canadian Economy* (Cambridge: Harvard University Press, 1959), p. 67, that "The threat of heavy labour migration to the United States, taken with the low labour intensity of Canada's major export industries, gives the Canadian tariff a clearer justification than that of almost any other nation." See also C. L. Barber, "Canadian Tariff Policy," *Canadian Journal of Economics and Political Science* (November 1955), pp. 513-530; W. E. Stolper and P. A. Samuelson, "Protection and Real Wages," *Review of Economic Studies*, IX (November 1941), pp. 58-73; and R. A. Mundell, "International Trade and Factor Mobility," *American Economic Review*, XLVL (June 1957), pp. 321-335.

opportunities in protected industries attracted savings from the rest of Canada and from abroad, and staunched a potential outflow of capital. In addition, protection may have raised the skill of the Canadian labour force, especially in Ontario, and induced a higher rate of savings in central Canada.[13]

Given the presence of the U.S. tariff, the Canadian tariff can be defended on the grounds that, in the long term, it has enlarged Canada's manufacturing sector and its urban population, and that it has enhanced a process of cumulative or polarized growth focused upon the urban-industrialized centres particularly those in Ontario. While a full analysis of these propositions would take us beyond the scope of this study, they clearly have an important bearing on the dynamic implications of any future decision to remove the Canadian tariff and should therefore be considered briefly.

The expansion of manufacturing that occurred during the high-tariff period of the nineteenth century encouraged the growth of cities. The protection received by Canadian industry during the early years fostered much of the high rate of urbanization, particularly around Montreal, Toronto, and Hamilton.[14] Subsequent growth of the service sector tended to cling to the original urban-industrialized communities, ensuring their continued vitality. Twentieth century tariff policy has been consciously arranged to encourage the movement into Canada of subsidiaries that are market-oriented and have therefore been attracted by pre-existent concentrations of population. Thus the major manufacturing areas of central Canada have grown into very much bigger market complexes than would have been possible in the absence of the tariff.[15] This is extremely important, for urban areas that were once highly dependent on their

13 A rapid increase in the savings ratio is essential to economic development. There is some reason to believe that wheat, Canada's major export staple at the turn of the century, was a poor source of national savings. See E. J. Chambers and D. F. Gordon, "Primary Products and Economic Growth: An Empirical Measurement," *Journal of Political Economy* (August 1966), pp. 315-332. At the same time, it was thought that industrial savings were readily increased by protection; A. S. Johnson, "Protection and the Formation of Capital," *Political Science Quarterly* (June 1908), pp. 220-241, cited in R. E. Caves, *Trade and Economic Structure* (Cambridge: Harvard University Press, 1960), pp. 252-253.

14 A good case for this emerges in E. J. Chambers and G. W. Bertram, "Localization and Specialization in Manufacturing in Central Canada, 1870-1890," in S. Ostry and T. K. Rymes (eds.), *Papers*. Canadian Political Science Association, Conference on Regional Statistical Studies, 1964 (Toronto: University of Toronto Press, 1965). The case is also made in G. W. Bertram, "Economic Growth in Canadian Industry, 1870-1915: The Staple Model and the Take-Off Hypothesis," *Canadian Journal of Economics and Political Science* (May 1963), p. 171; and in L. O. Stone, *Urban Development in Canada*, Dominion Bureau of Statistics (Ottawa, 1967), pp. 16, 29 and 278.

15 As Mackintosh noted in *The Economic Background to Dominion-Provincial Relations* (p. 150): "This is not to say that the centre of gravity of population and manufacture would have been outside these provinces."

region now determined, to a large extent, the economic viability of that region.[16]

Since the other regions of the country have been so much less fortunate in attracting and developing manufacturing, one might well ask whether the development of these regions has suffered as a consequence of the tariff's contribution to the growth of manufacturing at the centre. The issue is controversial, but there is no doubt that these other regions were taxed to subsidize the growth of manufacturing at the centre. Provincial governments in these regions have long demanded compensation, claiming that the backwash effects of industrial growth at the centre had led to regional losses in potential income, resource rents, local savings, skilled workers, and enterprise.[17] The tariff has undoubtedly undermined the capacity of these regions to service markets abroad.[18]

There may however have been offsetting influences. For instance, the tariff-factories and tariff-induced growth of manufacturing in central Canada might have contributed to the development of the other regions in the form of the spread effects of increased Canadian demand for their resources. But this argument seems weak, since the Canadian regions have until quite recently been somewhat competitive in the resources products they supply. On the other hand, it is unlikely that the other regions would have been free from the backwash effects of growth centres in the absence of the Canadian tariff. They would always have been subjected, given our assumptions about the U.S. tariff, to similar backwash effects from centres located across the U.S. border.

It seems reasonable to conclude, then, that these other regions suffered from the static effects of the tariff not only in the form of their annual tribute to producers in central Canada but also through a reduced capacity to export raw materials to foreigners. Canadian policy was defined in the interests of central Canada, where the mass of the people lived. If the other regions had been free to adopt regional tariffs, subsidies, and currency realignments, they might have been able to insulate themselves from some of the costs of National Policy (and the U.S. growth poles) and would have had a greater capacity to adapt to local opportunities. But since membership in the economic and monetary

16 N. H. Lithwick and G. Paquet, "Urban Growth and Regional Contagion," in *Urban Studies: A Canadian Perspective* (Toronto: Methuen, 1968), pp. 23-33.

17 Backwash effects encompass the loss of relatively uncompetitive yet income-creating industries, emigration of skilled labour and entrepreneurial talent, and the cumulative social and economic effects of these changes. A particular problem is the growing inability to attract or retain capital in the face of a general overestimation of profit opportunities at the centre. G. Myrdal, *Economic Theory and Underdeveloped Regions* (London: Duckworth, 1957), p. 27; and A. O. Hirschman, *The Strategy of Economic Development* (New Haven: Yale University Press, 1961), pp. 187ff.

18 Tariffs discourage exports by raising the costs of local supply, by appreciating the exchange value of local currency, and, more generally, by curtailing the foreigner's ability to import.

union precluded such measures, some compensation from the federal government was probably justified and, indeed, has always been forthcoming. Without these equalization measures, the tariff-assisted concentration of population and industry in central Canada would likely have been greater since the First World War than it has been.

The Canadian tariff has, of course, always been associated with the usual inefficiencies of resource allocation, duplication, short production runs, and in many instances slow adaptation to change. But given the U.S. tariff, it can be argued that protection promoted the emergence of dynamic growth poles in Ontario and Quebec, while spreading the opportunity costs more evenly across the country. It is not hard to find parallels in the experience of other countries to support the conclusion that tariffs can contribute to a dynamic process of expansion.[19] Without the tariff, its implicit subsidies, and its attraction of foreign enterprise, central Canada could not have developed such a balanced industrial structure.

It would indeed be surprising if 100 years of infancy protection had not left Canada with a large nucleus of manufacturing industries capable of existing without the tariff. The possibility that most of the industrial structure of central Canada could now survive reflects the fact that interregional trade and domestic demand have enabled the manufacturing sector to attain sufficient size and depth to support a pattern of comparative advantage that is not reversible.[20] Here, of course, size relates to scale economies, while depth involves external economies and backward linkages into the Canadian resource base — as in petroleum, nonferrous metals, and primary iron and steel — or linkages into scale economy industries — such as iron and steel, industrial chemicals, and even textiles.[21]

The current stock of labour skills, the viability of existing urban and transportation infrastructures, as well as the pattern of linkages among

19 H. J. Habakkuk, "The Historical Experience on Basic Conditions of Economic Progress," in L. H. Dupriez (ed.), *Economic Progress* (Louvain, International Association, 1955). Habakkuk argues with respect to a number of countries: "It is difficult to see how, without protection, these countries could have a 'balanced imitation,' the simultaneous development of several industries, which was essential to economic growth. It is conceivable that Germany, for example, might have developed her primary iron industry without protection, but it is not likely that she would have developed her metal manufacturing and textile industries, which by their demand created the conditions for a successful machine tool industry" (pp. 168-169). See also C. P. Kindleberger, "Protected Markets and Economic Growth," in *Factors Affecting the U.S. Balance of Payments*, Studies for the Subcommittee on International Exchange and Payments of the Joint Economic Committee (Washington, D.C.: U.S. Government Printing Office, 1962).

20 H. B. Chenery, "Comparative Advantage and Development Policy," *American Economic Review* (March 1961), pp. 18-51; S. B. Linder, *An Essay on Trade and Transformation* (New York: John Wiley, 1961).

21 J. N. Wolfe, "Transport Costs and Comparative Advantage," *Journal of Political Economy*, LXVII (August 1959), pp. 392-397.

industries in central Canada owes much to the legacy of protection. The immediate impact of removing the tariff at this juncture is explored in Chapter 4. The dynamic responses that would be set loose by a policy of freer trade are more difficult to predict, but they would very likely reinforce trends that are already discernible in the manufacturing experience of Ontario and Quebec and particularly the long-term revealed comparative advantage of these two regions vis-à-vis the other regions and other countries.

Comparative Advantage and the Regions

A rigorous examination of the characteristics of regional trade patterns and their change over time is presented in Appendix A. While this analysis reflects only tangentially on the capacity of Ontario and Quebec manufacturing industries to survive the removal of the tariff, it does suggest that there would be significant differences in the pattern of regional adaptation that could prove important. As a spin-off from that detailed analysis, the respective trading strengths of those two regions was derived using a variety of industrial characteristics.[22] A numerical value was attached to each descriptive characteristic of each region's exports abroad (X_F), export to other regions (X_R), and imports from other regions (M_R) and then the values derived for the two regions were contrasted. The numerical value — the "average content characteristic" ($ACC\text{-}X_F$, $ACC\text{-}X_R$, or $ACC\text{-}M_R$), — was derived by weighting the descriptive characteristic for each industry by the share represented by that industry's products in the relevant trade bundle. The average content characteristic ($ACC\text{-}X_F^\circ$) is, for instance, equivalent to the average content of this characteristic in a standard million dollars worth of Ontario's foreign exports.[23] The relative regional trading strengths for some 16 characteristics are summarized in Table 1-5.

Ontario's relative trading strength is in products of industries with high values for each of the following eight characteristics:

— plant economies of scale (SCAP);
— research and development (R&D);
— four-firm concentration ratio (SCAF);
— professional and technical manpower (PROT);

22 For a fuller description of the analysis and a complete glossary of the notation used here, see Appendix A.

23 The concept of the average content characteristic of a million dollar bundle of a region's imports or exports is explained in Appendix A. Each particular descriptive characteristic, derived for each three-digit industry at the national level, was weighted by that industry's share in the relevant regional trade bundle. The regional trade bundles used were X_F (1968), X_R (1967), and M_R (1967).

— foreign ownership (OWN);
— wages (W);
— growth in the 1961-71 period (G); and
— first-trade date (FTD).

The average content characteristic for Ontario's exports abroad exceeded that for Quebec in each of these characteristics. But in addition, it was greater than that for exports to other regions or imports from them.

Quebec's relative trading strength appears to lie in the products of industries with:

— a high input-output I/O coefficient for the use of primary products from forestry, fishing, and mining (FFM);
— a high I/O coefficient for the use of energy (EN);
— a high I/O coefficient for labour with only an elementary education (EL-EMP);
— a high usage of unskilled labour (LAB);
— a larger amount of capital per man than in the comparable U.S. industry (CAP);
— a larger establishment size relative to the comparable U.S. industry (SIZE);
— a low indicator value for economies of scale (SCAP); and
— a low efficiency wage relative to the comparable U.S. industry (REW).

The average content characteristic for Quebec's exports abroad exceed that for Ontario's in each of these characteristics except the scale and efficiency wage indicators.[24] As in Ontario, it was higher than that for exports to other regions or imports from them.

The relative trading strength indicators do not completely reflect regional comparative advantage in that no account is taken of each region's imports from abroad.[25] Nevertheless, since each region must have a comparative advantage in some industries, these industrial characteristics offer some indication of the probable direction of further regional specialization.

The principal manufacturing industries in Ontario and Quebec that have a revealed capacity to export to foreign markets and meet foreign competition are shown in Table 1-6. Although these industries account for approximately three-quarters of each region's manufactured exports, their dollar value in Ontario was well in excess of double that in Quebec;

24 Ontario's exports abroad exhibit a higher value on the scale and efficiency wage indicators. The efficiency wage is the wage bill divided by value added (see Appendix A).

25 No satisfactory way has yet been devised to allocate national imports by industry to particular regions.

Table 1-5

Relative Trading Strength in Manufacturing, by Industry Characteristic, Ontario and Quebec

	Average content characteristic, Ontario/Quebec			
	Foreign exports	Regional exports	Regional imports	Regional imports/regional exports
Ontario	X_F	X_R	M_R	X_R/M_R
SCAP	2.62	1.73	0.56	3.10
R&D	1.89	2.25	0.50	4.45
SCAF	1.68	1.29	0.76	1.68
PROT	1.54	1.54	0.67	2.27
OWN	1.34	1.09	0.90	1.22
G	1.21	1.09	0.95	1.15
W	1.10	1.09	0.94	1.16
FTD	1.06	1.02	0.98	1.04
Quebec				
FFM	0.38	1.63	1.72	0.37
EN	0.60	1.50	1.33	0.61
LAB	0.71	0.86	1.15	0.74
EL-EMP	0.74	0.87	1.10	0.80
CAP	0.90	0.95	0.99	0.96
CRAF	0.96	0.95	1.05	0.90
SIZE[1]	0.95	0.97	1.04	0.93
REW[2]	0.95	0.97	1.04	0.94

1 Reported on a Canada/U.S. basis.
2 Reported on a U.S./Canada basis.

Source: See Appendix A.

Table 1-6

Share of Region's Foreign Exports of Selected Manufacturing Industries, Ontario and Quebec, 1968

	Quebec	Ontario
	(Per cent)	
Distilleries	1.7	1.9
Pulp and paper mills	23.4	7.1
Iron and steel mills	2.5	2.8
Smelting and refining	24.4	10.5
Miscellaneous machinery and equipment	2.0	3.2
Aircraft parts manufacture	6.1	3.9
Motor vehicles	7.9	30.3
Motor vehicle parts	.7	13.6
Communications equipment	2.9	1.5
Industrial chemicals	1.7	2.0
Total	73.3	76.8

Source: Based on data from Statistics Canada.

and while they accounted directly for about a third of the manufacturing employment in Ontario, little more than one-fifth of the manufacturing employment of Quebec was in these industries.

The appendicized analysis of historical trends in industrial location reveals that in the course of a century Ontario has shown peculiar proclivity to attract the new growth industries and that these new industries have shown a reluctance to move towards regions with a relative abundance of unskilled labour. Furthermore, the contemporary analysis of interregional trade in manufactured goods fails to uphold, in any simple way, expectations drawn from the traditional model that interregional trade arises from differences in relative factor endowments. This is not perhaps surprising in view of the mobility of skilled labour and capital, the location of markets, and the dominant direction of international trade and investment in foreign subsidiaries.

Ontario's development and industrial structure owe much to the importance of coal, foreign ownership, corporate power, and government assistance. But its growth also appears to have cumulative characteristics: the achievement of successive thresholds of internal and external economies, linkages, and market potential.[26] In contrast, the industrial structure of Quebec, aside from the resource-processing field, has become increasingly dependent upon slow-growing, high-tariff, nineteenth-century industries. Thus, there is some cause for concern that unilateral removal of the tariff might further concentrate Canada's manufacturing sector in Ontario, despite the availability of labour resources in the other regions, particularly Quebec.

Professor Kaldor has recently developed a model of regional interaction that appears to encompass just such a historical trend towards industrial concentration.[27] His model, which explicitly takes account of the self-reinforcing nature of a region's relative success in manufacturing, relies upon the so-called Verdoorn Law and the link between manufactur-

26 The "market potential" for a location is defined as the sum of retail sales to each market divided by its distance from that point. Toronto has by far the highest market potential in Canada. Michael Ray has shown that Toronto's market potential was second to that of Montreal in 1931, and that its predominance is a post Second World War phenomenon. See his articles, "The Spatial Structure of Economic and Cultural Differences: A Factorial Ecology of Canada," in *Papers of the Regional Science Association*, XXXIII (1969), p. 10.

27 N. Kaldor, "The Case for Regional Policies," *Scottish Journal of Political Economy* (November 1970), pp. 337-340.

ing wages that prevails at any time within and between regions.[28] In contrast with the factor proportions or traditional trade theory based upon the factor endowments of the particular regions, Kaldor's model correctly asserts that a region's endowments are often the product of a dynamic process of development:

> I am sure that this principle of cumulative causation — which explains the unequal regional incidence of industrial development by endogenous factors resulting from the process of historical development itself rather than by exogenous differences in "resource endowment" — is an essential one for the understanding of the diverse trends of development as between different regions.[29]

Our lack of success in explaining the structure of manufacturing in Ontario and Quebec on the basis of factor endowments and factor intensities, and the apparent inability of the product-cycle theory to explain why more segments of the new growth industries have failed to move away from Ontario may reflect the relevance of the Kaldor model to the Canadian context of relatively high factor mobility.

The most substantial evidence that Kaldor's model applies to the current situations in Canada is Hodge's finding that despite the apparent availability of substantially lower costs of labour, land sites, and local taxes elsewhere in the country, private profitability has been tying the rapidly growing industries to the fast-growing area of southern Ontario.[30] The analysis in Appendix A, although far from definitive, suggests that there was some association in the 1961-73 period between the rate of growth of a province's manufacturing output and its rate of growth of labour productivity in manufacturing. This lends support to the relevance of the Verdoorn Law. Furthermore, it indicates that across Ontario's 129 manufacturing industries there has indeed been a negative correlation between relative output growth rates and relative efficiency wage rate

28 The Verdoorn Law postulates the existence of a strong association of the rate of growth of output and the rate of growth of productivity in a region. The observed relationship among money wages in different regions stems from the existence of some mobility of labour and also from the pressures associated with collective bargaining for the maintenance of "traditional comparabilities." In Kaldor's model this wage relationship is used as an endogenous factor, such that exogenous changes in the demand for one region's manufactured exports lead to an increase in that region's productivity and a decline in the rate of growth of its efficiency wage (the index of wages per unit of output) relative to that of other producing regions. As the efficiency wage moves in favour of the expanding region, its competitiveness will be enhanced, generating further increases in output through the expansion of existing plants and the attraction of investment. Other regions, subjected to rising relative efficiency wages, become increasingly less competitive in all lines of manufacturing.

29 *Ibid.*, p. 343.

30 G. Hodge, "Theory and Reality of Industrial Location in the Toronto Region," A Report to the Regional Development Branch, Ontario Department of Treasury and Economics, Toronto (August 1970), pp. 1-30.

changes as implied by the Kaldor model.[31] When combined with other characteristics, such as foreign ownership, monopoly power, and economies of scale, the model might help to explain why the static regional cost differences by industry, cited by the Wonnacotts, do not appear to be consistent with the contemporary patterns of industrial location in Ontario and Quebec.[32]

Conclusion

This survey of Canada's tariff history has emphasized the importance of Canada's growing trade dependence on the United States and the part played by the tariff in the growth and regional concentration of the manufacturing sector, particularly in Ontario. A historical analysis of the changing size of the net tariff transfers to the two central regions showed these flows to be large and an increasing relative burden to the other regions until the Second World War. In recent decades the importance of these flows has declined, with Quebec emerging as the principal beneficiary. It was suggested that particularly when polarization pressures from centres in the United States were strongest, the dynamic repercussions of the tariff transfers promoted the growth and development of Ontario and Quebec. Simply from the perspective of central Canada, the process may be viewed as a tradeoff in which urban growth poles were stimulated and population and industrial and market potential increased at the expense of a somewhat higher average standard of living in a less diversified economy.

The review of the current trading strengths of Ontario and Quebec in manufactured goods serves to integrate the other sections of the chapter while drawing heavily from the appendicized analysis of trade and industrial location. Distance, initial advantages, government tariff policy and approach to nontariff barriers seem to have established Ontario as the industrial heartland of Canada, a dominance that is now confirmed and compounded by market rigidities and cumulative causation. The comparison of regional trading strengths is offered as suggestive evidence that Canada's manufacturing regions now have very different capacities to adapt to the impact effects of tariff removal.

As we proceed through the more empirical chapters of this study, we shall have occasion to refer back to perspectives developed here, for, to the extent that the disequilibrium model has relevance to Canada, corporate responses that accompany tariff removal will be very different

31 These investigations have been brief, but it is hoped the findings may provoke others to undertake more intensive analysis of the model.

32 Their estimates of regional cost differences by industry are cited in Appendix A. R.J. Wonnacott and P. Wonnacott, *Free Trade Between the United States and Canada* (Cambridge: Harvard University Press, 1967).

in the two manufacturing regions. And, as we shall see, this necessarily influences the estimation of the static as well as the dynamic impact effects. If regionally oriented compensation programs are not instituted to accompany tariff removal, further concentration of Canada's manufacturing sector in Ontario may be inevitable.

2 Trade and Employment Patterns

In this chapter, patterns of regional demand and supply as they existed in 1970 are summarized, and from this picture some simple generalizations about the expected regional effects of tariff removal are advanced. Drawing together the necessary data and anticipating the type of analytical procedures required, the chapter prepares the ground for the disaggregated empirical analysis of the initial effects of tariff removal in Chapters 3 and 4. Much of the regional data necessary for this study were not available. However, detailed estimates of regional demand for and supply of both manufactured and primary goods in 1970 were laboriously assembled with extensive assistance from the Department of Regional and Economic Expansion and Statistics Canada.[1]

Profiles of trade and employment in the manufacturing industries in the various regions in 1970 were prepared by combining the following bodies of data: manufacturing shipments, by industry, by region; exports, converted to an industry basis by region of lading; imports and duties paid, converted to an industry basis, by region of clearance; interregional shipments of manufactures, by industry, for 1967; employment in manufacturing, manufacturing activity basis, by industry, by region.[2] The apparent patterns of regional specialization and trade dependence obtained by combining these data can only be reported as approximations. While a great deal of effort has been expended on these estimates, there are numerous weaknesses in the data, the most important of which stem from the use of 1967 trade coefficients for the interregional disposition of domestically produced and consumed goods in 1970. At the outset, it is generally conceded that the coefficients in the 1967 study were heavily biased towards Ontario and Quebec, since interregional flows were recorded on a first-destination basis. Application of the 1967 coefficients to the 1970 data is especially suspect where new production

1 The estimates for manufactured goods were prepared at the three-digit Standard Industrial Classification (SIC) level and those for primary goods were prepared at the input-output commodity level. The tables in Appendix C reveal the industrial disaggregations for each region at the two-digit level.

2 Based on data from Statistics Canada, *Census of Manufactures*, Cat. no. 31-203; *The Destination of Shipments of Manufacturers, 1967*, Cat. no. 31-504 (July 1971); and special tabulations.

facilities were introduced or where exports as a share of regional production changed radically. In addition, the reporting of imports on a first-destination basis constitutes another weakness. Despite the limitations of the data, the revealed patterns of regional production (supply) and local disappearance (demand) of manufactured goods provides the necessary backdrop for a detailed evaluation of the regional impact of free trade.

Employment and Production in Manufacturing

Canada's manufacturing sector is concentrated in Ontario and Quebec; in 1970 these two regions together accounted for 80 per cent of total manufacturing employment (see Table 2-1). In the other three regions, manufacturing employment as a share of total employment is well below the Canadian average. As can be seen, manufacturing in Quebec and the Atlantic region is particularly labour-intensive, with almost 37 per cent of manufacturing employment in these regions contributing just over 32 per cent of the shipments of manufactured goods.

Table 2-1

Share of Manufacturing Employment and Shipments, by Region, 1970

	Share of manufacturing employment	Ratio of manufacturing employment to total regional employment	Share of shipments manufacturing
		(Per cent)	
Atlantic	5.11	15.76	3.82
Quebec	31.69	26.73	28.45
Ontario	48.23	28.14	51.83
Prairies	6.99	10.38	7.82
Pacific	7.98	17.41	8.08
Canada	100.00	22.72	100.00

Source: Statistics Canada, *Census of Manufactures* (Manufacturing Activity Basis), Cat. no. 31-203, and *idem, Labour Force Survey* (Total Activity Basis), Cat. no. 71-001.

Regional differences in the structure of the Canadian manufacturing industry stand out in the industrial disaggregations in Appendix Tables C-1 and C-2. For example, 61 per cent of the manufacturing employment in the Atlantic and Pacific regions is dependent upon a few resource-processing industries, pulp and paper and wood products industries, and the food and beverages industry. The comparable figure for the Prairies is 35 per cent. The manufacturing sectors in both Ontario and Quebec are more broadly based, although 15 per cent of Quebec's employment is in the clothing industry and 12 per cent of Ontario's is concentrated in the

transportation equipment industry. These differences in industrial structures imply vastly different regional responses to tariff changes.

The manufactured goods produced in a region are distributed among local markets, interregional exports, and foreign exports. Assuming that the distribution of employment dependence conforms with the distribution of shipments by market area — the constant productivity assumption — regions with above-average employment dependence upon local markets and interregional exports would likely suffer from removal of the Canadian tariff.

Data in Table 2-2 indicate that manufacturing employment in Quebec and to a lesser extent the Prairies is heavily dependent upon interregional exports and thus could be expected to be adversely affected by tariff removal. In addition, in the Prairies, manufacturing employment appears to be highly dependent on its local market. Tables C-1 and C-6 reveal that food and beverages and clothing are the principal interregional exports of the manufacturing sector of that region. Fully a third of Quebec's employment dependence on interregional exports is accounted for by the protected clothing industry alone, which exports 82 per cent of its shipments in interregional trade (see Tables C-1 and C-4). The other exposed industries in Quebec would appear to be textiles, metal fabrication, and electrical products. Employment in Ontario and the Pacific region is likely to be less vulnerable, since more of their manufacturing employment relies upon foreign markets and they have a relatively low overall dependence upon interregional exports. Even the Atlantic region would be less affected than Quebec or the Prairies, because of its high dependence on foreign markets.

With this picture of regional trade and employment patterns in mind, suppose that the removal of the Canadian tariff would result in a loss of 100,000 jobs in industries serving the Canadian market, but that this loss would be offset by the creation of 100,000 jobs in manufacturing industries that service export markets because of devaluation and/or removal of foreign tariffs. Apportioning these losses and gains on the basis of shares in the lower half of Table 2-2, one finds that Quebec and the Prairies would lose manufacturing employment to the Pacific region and Ontario. The employment transfer in this illustration might be between 3,500 and 9,000 jobs, depending upon the division of the employment loss between that dependent upon local sales and that dependent upon interregional sales (see Table 2-3).

This simple example illustrates how more disaggregated industrial data may be applied. In reality, of course, the regional distribution of job losses would depend upon the location of particularly vulnerable industries (probably those currently with the highest protection) more than on the distribution of all manufacturing. The precise number of jobs lost or gained would depend on appropriate elasticities as well as the relative labour intensity of production in export and import-competing industries. In fact, one would expect that job losses in import-competing industries would not be matched by parallel job increases in the export-oriented sectors, because the latter are less labour-intensive.

Table 2-2

Share of Manufacturing Employment Dependent on Various Markets,[1] by Region, 1970

	Local market	Inter-regional exports	Foreign exports	Total
		(Per cent)		
Atlantic	37.37	31.50	31.13	100.00
Quebec	43.06	37.05	19.89	100.00
Ontario	49.08	26.60	24.32	100.00
Prairies	52.42	34.85	12.73	100.00
Pacific	41.70	13.74	44.57	100.00
Canada	46.22	29.71	24.07	100.00
Atlantic	4.13	5.42	6.61	5.11
Quebec	29.53	39.52	26.19	31.69
Ontario	51.21	43.17	48.74	48.23
Prairies	7.93	8.20	3.70	6.99
Pacific	7.20	3.69	14.77	7.98
Canada	100.00	100.00	100.00	100.00

1 Assuming distribution of employment dependence conforms with distribution of shipments by market area.

Source: See Tables C-1 through C-7.

Table 2-3

A Hypothetical Illustration of Interregional Job Transfers with Tariff Removed

	Employment transfers[1]		
	1	2	3
	(Number of jobs)		
Atlantic	+335	+206	+310
Quebec	−2,835	−3,834	−7,830
Ontario	+1,040	+1,844	+5,060
Prairies	−1,075	−1,102	−1,210
Pacific	+2,535	+2,886	+4,290

1 Based on an employment loss of 100,000 jobs. Column 1 illustrates a 50:50 division of the loss between that dependent on local sales and that dependent on interregional sales; column 2, a 40:60 division; and column 3, a 0:100 division.

The impression that Ontario and the Pacific region would gain manufacturing employment from the removal of the tariff while Quebec and the Prairies would lose is enhanced by the further insight that manufacturing employment in Quebec is highest in the most vulnerable, labour-intensive industries. That this employment is dependent upon

Canada's highest tariff levels is apparent from Table 2-4. For instance, 52 per cent of the employment in Canada that was dependent upon industry tariff levels in excess of 17.5 per cent in 1970 was located in Quebec. While only 24 per cent of Canada's total manufacturing employment was in these industries, the comparable shares for Quebec, Ontario, and the Pacific region were 40, 18, and 9 per cent, respectively.

Table 2-4

Tariff-Dependent Employment, Cumulative, by Region, 1970

Nominal tariff levels[1]	Canada	Atlantic region	Quebec	Ontario	Prairies	Pacific region
			(Per cent)			
over 25.0	1.2	1.0	1.9	0.9	1.4	1.0
	(100.0)	(4.2)	(48.0)	(33.4)	(8.1)	(6.3)
over 20.0	16.1	4.8	28.9	11.1	13.2	4.5
	(100.0)	(1.6)	(57.3)	(33.1)	(5.7)	(2.3)
over 17.5	24.5	17.1	40.0	18.5	17.5	9.2
	(100.0)	(3.7)	(52.1)	(36.2)	(5.0)	(3.0)
over 15.0	48.2	32.0	60.4	46.6	44.1	23.5
	(100.0)	(3.5)	(39.9)	(46.3)	(6.4)	(3.9)
over 12.5	78.1	74.1	83.8	80.1	65.6	56.4
	(100.0)	(5.1)	(34.2)	(49.1)	(5.9)	(5.7)
over 10.0	82.2	79.5	86.3	84.9	72.2	60.1
	(100.0)	(5.2)	(33.4)	(49.4)	(6.2)	(5.8)
	100.0	100.0	100.0	100.0	100.0	100.0
	(100.0)	(5.1)	(31.7)	(48.2)	(7.0)	(8.0)

1 Duties to dutiable imports.

Source: Prepared from a 129-industry disaggregation of Canadian manufacturing.

Regional Demand for Manufactured Goods

The removal of Canada's tariffs would give all regions access to cheaper products. A familiar generalization about demand patterns is that regions currently importing heavily from other regions would tend to import more from abroad after elimination of the tariff. On that basis, changes in the source of supply would be expected to bring especially large cost savings to the Atlantic region, the Prairies, and the Pacific region (see Table 2-5). The cost savings to Ontario might be much smaller, for not only do interregional imports represent an exceptionally small share of total demand in this region in all industries except clothing, but a high proportion of Ontario's heavy dependence upon foreign imports consists of goods that already enter free of duty.[3]

3 The proportion of imports entering Ontario free in 1970 was 61 per cent; in the rest of Canada the proportion was 44 per cent.

Table 2-5

Share of Domestic Disappearance, by Source of Supply and Region, 1970

	Local supply	Interregional imports	Foreign imports	Total
		(Per cent)		
Atlantic	32.21	52.90	14.89	100.00
Quebec	52.79	25.29	21.92	100.00
Ontario	54.48	13.29	32.23	100.00
Prairies	44.15	41.62	14.23	100.00
Pacific	42.22	33.53	24.25	100.00
Canada	50.73	23.43	25.84	100.00
Atlantic	2.96	10.5	2.65	4.65
Quebec	28.33	29.4	23.09	27.23
Ontario	51.46	27.2	59.79	47.92
Prairies	10.12	20.7	6.30	11.63
Pacific	7.13	12.3	8.08	8.57
Canada	100.00	100.00	100.00	100.00

Source: See Tables C-8 through C-12.

Demand in all the other regions is more dependent upon interregional imports (see Tables C-9 to C-13).

A more interesting generalization, and one that is more easily quantified than interregional differences in cost savings, involves the transfers from users in one region to protected producers in another in the form of tariff-induced markups on domestic prices that would disappear with the removal of the tariff. The precise amount of these transfers would depend upon the relevant tariff markups as well as the absolute size of the interregional flows. A comparison of the horizontal shares in Tables 2-2 and 2-5 suggests that tariff removal would likely deprive Ontario and Quebec of net tariff transfer receipts, because the share of their output sold in interregional trade exceeds the share of their demand that comes from interregional trade. In fact, the gain to the Atlantic, Prairie and Pacific regions from the elimination of tariff transfers would be far greater than could be deduced from the shares in Tables 2-2 and 2-5. The difference in the absolute levels of the interregional imports and exports of manufactured goods in these three regions ensures that they would be net beneficiaries of the elimination of tariff transfers.[4]

4 This difference is apparent in the relevant ratios of interregional exports to interregional imports: Ontario, 1.80; Quebec, 1.12; Atlantic, 0.44; Prairie and Pacific regions, 0.36.

Conclusion

This review of existing patterns of trade and production of manufactured goods leads to the following conclusions. Although all regions would enjoy cost savings from the removal of the tariff, in Ontario and Quebec these would be largely offset by the loss of tariff transfer receipts from the other regions. Losses in manufacturing output and employment from tariff removal would likely emerge principally in Quebec and the Prairies. However, because of the different importance of manufacturing industries in these two regions, the losses in Quebec would be more disruptive. In the next two chapters these expectations are subjected to more rigorous analysis and detailed quantification.

3 Cash Costs and Interregional Tariff Transfers

The regional implications of a unilateral decision to remove the Canadian tariff are presented in this chapter and the next. This is not, of course, the most desirable policy option. However, unilateral tariff removal, combined with an appropriate devaluation of the Canadian dollar, would lead to a restructuring of the economy that would mainly differ in degree from that implied by other policies for freer trade.[1] Examination of this option provides a basis for the evaluation of the general effects of other possible approaches. This chapter presents detailed estimates of the cash cost to final users — or markup paid by the residents of each region — as a result of the tariff; the subsidy-equivalent of the tariff received by the producers of protected manufactured goods in each region; and from them, the interregional tariff transfers. With tariff removal these three elements — the tax, the subsidy, and the interregional transfers — would disappear. Chapter 4 traces the impact of these changes upon manufacturing employment in each of the regions.[2]

At the outset, it must be stressed that the analysis is derived from a static, partial-equilibrium approach and that little attempt is made until Chapter 4 to integrate general-equilibrium repercussions into the model. A number of cavalier — although widely used — assumptions are invoked, and considerable liberty is taken with rather limited data. The overriding assumptions are that foreign tariffs remain unchanged, that Canadian demand has no effect upon foreign prices, that domestic supply curves slope upward to the right, and, for the moment, that no devaluation would accompany the removal of the Canadian tariff.

1 See R. J. Wonnacott, *Canada's Trade Options*, Economic Council of Canada (Ottawa: Information Canada, 1975). We return to this proposition in Chapter 5.

2 The analysis in these two chapters represents a far more precise test of generalizations derived elsewhere in this study. The findings are summarized in the text, while the disaggregated industrial detail can be found in Appendices D and E. But since it is important that the rather restricted relevance of the findings is understood, the analytical techniques and data selection are discussed in some detail in the text, as well as Appendix B.

The Cash Costs of the Tariff

The gross cash cost of the tariff to *final users* for all industries will differ from region to region depending upon levels of income and the peculiarities of local demand.[3] The cost to final users of the products of any industry in a region is represented by area GJZW in the familiar partial-equilibrium diagram (see Chart 3-1).[4] This cost — the loss in consumers' surplus — is made up of the gross cash cost of the tariff to the region (area GJYW) and the deadweight consumption loss (area JZY).[5] The area GJYW represents the three types of transfers resulting from the tariff: intraregional transfers from local users to local producers; interregional transfers from local users to producers in other regions; and transfers of duty on imports from local users to the federal government. The relative size of each of the components will differ among regions as they draw upon local production, interregional imports, and imports from abroad in different proportions.

The estimates of regional final demand by industry for 1968 and 1970 were derived from national aggregates, assuming that final use of the products of any industry would represent the same proportion of total personal income in each of the five regions.[6] But since the pattern of final demand in each region may be poorly reflected by this assumption of constant income shares, particularly in capital goods industries, a second

3 Measures of the gross cash cost should be derived on the basis of the tariff-induced markup on *end products*, a stipulation that is especially important in the regional context, since it gives rise to tremendous problems of quantification. Use of this approach is necessary because of the large amount of double-counting involved in the shipments reporting base. Moreover, it represents the generally recognized means of breaking into the circle of production, and it should ensure that the excess cost attributed to the tariff will match up with the transfer receipts of Canadian producers and the federal government. This final-transactions approach should be distinguished from the shipments approach adopted in Chapters 1 and 2.

The technique for measuring the gross cash cost was first introduced by J. B. Bridgen, *et al.*, in *The Australian Tariff: An Economic Enquiry* (Melbourne: Melbourne University Press, 1929), and has been previously applied to Canadian data by N. McL. Rogers, in *A Submission on Dominion Provincial Relations and the Fiscal Disabilities of Nova Scotia within the Canadian Federation* (Halifax, 1934); J. H. Young, in *Canadian Commercial Policy*, Royal Commission on Canada's Economic Prospects (Ottawa, 1957); and R. A. Shearer, J. H. Young, and G. R. Monroe, in *Trade Liberalization and Regional Economy: Studies of the Impact of Free Trade on British Columbia* (Toronto: University of Toronto Press, 1971).

4 H. G. Johnson, "The Cost of Protection and the Scientific Tariff," *Journal of Political Economy*, LXVIII (August 1960), pp. 327-345.

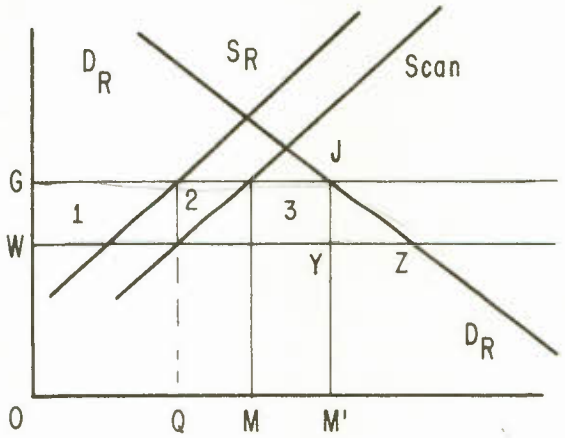
5 Since it is not the main intention to measure the welfare loss to Canada attributable to the tariff, we shall pay scant attention to the deadweight consumption and production losses. Conventionally, these losses are large. See S. P. Magee, "The Welfare Effects of Restrictions on U.S. Trade," *Brookings Papers on Economic Activity*, no. 3 (1972), pp. 645-701.

6 Statistics Canada, *The Input-Output Structure of the Canadian Economy 1961*, vol. 1, Cat. no. 15-501. The procedures for estimating final demand are specified in Appendix D.

approach to the regional apportionment of final demand was also followed. Under the alternative approach total final demand was apportioned by industry on the basis of the regional shares of domestic disappearance of all domestically produced goods.[7] It is important to keep in mind the distinctions between the main approach and the alternative approach.[8]

Chart 3-1

Regional Cash Cost of the Tariff



In developing a first approximation of regional costs of the tariff, it was assumed that the tariff protection given producers of final products in each industry is fully utilized, and that the tariff rate on final goods in each industry is reflected in the ratio of duties to dutiable imports in 1968 and 1970.[9] Estimates of the gross cash cost on final demand in each

7 These shares were obtained from Statistics Canada, *Destination of Shipments of Manufacturers, 1967*, Cat. no. 31-504 (July 1971).

8 The alternative approach represents a weak alternative, except in the case of a few particular industries (e.g., machinery and equipment), because domestic shipments in the 1967 study (Statistics Canada, *Destination of Shipments of Manufacturers, 1967*) are likely to overstate the final demand shares of Ontario and Quebec for two reasons:

First, they are expressed in terms of gross flows and therefore include sales to other stages of production, which are likely to be located in central Canada. This form of inflation is likely to be high in such items as textiles. There is also the double-counting of intermediate sales on goods that are subsequently exported when finished.

Second, the figures were collected on the basis of *first* destination. In many cases this would be a centrally located wholesaler. Some internal shipments are known to have ultimately been exported, but their first destination was also likely to have been central Canada.

9 In practice, some producers, because of domestic competition, may not be able to charge the world price plus the full amount of the tariff. In other cases, because of the presence of nontariff barriers to trade, such as under the voluntary export restraint program for textiles, domestic producers may set prices considerably higher than the world price plus the tariff. For further detail see Appendix D.

region were then derived by multiplying the final demand for the region by the tariff "markup" (see Table 3-1).[10]

Gross cash costs are high, totalling 5.71 per cent of total personal income in all regions in 1968 and 4.95 per cent in 1970; the net cash cost after deducting duties paid to the government was 4.08 per cent and 3.48 per cent in those years, respectively.[11] Only under the alternative approach do the gross cash costs differ among the regions (see Table 3-2).

The large drop in gross cash costs from 1968 to 1970 implied by the fall in the percentage share of personal income lost as a result of the tariff is misleading for the absolute costs actually increased by 3.8 per cent during the period. The decline in relation to incomes can be explained in part by the lowering of tariffs, but the bulk of it is due to the fall in the share of final expenditures on manufactured goods.[12] This phenomenon is explained in large part by the radical changes in the demand for transportation equipment associated with the Auto Pact and the concomitant rationalization of the transportation equipment industry, both of which weaken the procedure adopted for estimating final demand.[13] For simplicity, the estimates of final expenditures have not been altered.

10 From Chart 3-1, the gross cash cost (area GJYW) = $\frac{tn}{1 + tn}$ (OG) (OM), and the consumption loss (area JZY) = $\frac{1}{2}(tn/1 + tn)^2$ η (OM), where tn is the tariff rate on final goods in each industry. The elasticity of demand, η, is taken to be equal to one; higher elasticities would merely increase area JZY.

11 These figures are much lower than the 5.32 per cent figure derived from 1969 by using the shipments approach (Table 1-3), but they are somewhat higher than the findings of Young, whose estimates of the *net cash cost* of the tariff in 1954 were equivalent to between 3.2 and 3.9 per cent of personal incomes but Young did not take account of government purchases. See Young, *Canadian Commercial Policy,* p. 72.

12 The ratio of final expenditures on manufactured goods to total personal income fell from 37.7 per cent in 1968 to 33.6 per cent in 1970 (it was 40.5 per cent in 1961). Such a rapid change suggests a flaw in the procedures for estimating final demand from the 1961 input-output table. In fact, there is a weak link in the procedure. The ratio of total shipments of all manufactured goods (intermediate and final) to personal incomes fell from 78 per cent in 1968 to 72 per cent in 1970, a decline of 7.7 per cent in two years. Estimates of this ratio for final expenditures, excluding transportation equipment, fell from 29.8 per cent to 27.7 per cent, which is a similar decline of 7.0 per cent. The decrease in the ratio of final expenditures on transportation equipment to personal income explains why the total ratio fell by 11.0 per cent from 1968 to 1970.

13 Final expenditures on these products as a share of personal income were estimated at 7.9 per cent in 1968 and 6.0 per cent in 1970, a decline of 24 per cent. While this seems excessive, it must be noted that a 31.8 per cent increase in exports, a 9.6 per cent decline in imports, and a 2.8 per cent increase in shipments resulted in a fall in the domestic disappearance for this industry of 16.2 per cent. Actual domestic disappearance figures (intermediate and final) as a share of personal income were 15.7 per cent in 1968 and 11.0 per cent in 1970, a decline of over 30 per cent. Thus the gross cash cost for the industry fell by 16 per cent accounting for 44 per cent of the overall drop in gross cash costs between 1968 and 1970.

Table 3-1

Gross Cash Cost of the Tariff, by Region, 1968 and 1970

	1968			1970		
	Gross cash cost	Share of personal income	Consumption loss[1]	Gross cash cost	Share of personal income	Consumption loss[1]
	(Millions of dollars)	(Per cent)		(Millions of dollars)	(Per cent)	
Atlantic	211.9	5.71	0.45	220.7	4.95	0.38
Quebec	815.6	5.71	0.45	836.0	4.95	0.38
Ontario	1,278.7	5.71	0.45	1,354.6	4.95	0.38
Prairies	510.6	5.71	0.45	500.3	4.95	0.38
Pacific	331.1	5.71	0.45	354.6	4.95	0.38
Canada	3,147.9	5.71	0.45	3,266.3	4.95	0.38
Duties	900.3	1.63		970.7	1.47	
Net cash cost	2,247.6	4.08		2,295.6	3.48	

1 As a share of personal income.

Source: Based on industrial disaggregations in Tables D-1 to D-4.

Table 3-2

Gross Cash Cost of the Tariff, Alternative Approach, by Region, 1968 and 1970

	1968			1970		
	Gross cash cost	Share of personal income	Consumption loss[1]	Gross cash cost	Share of personal income	Consumption loss[1]
	(Millions of dollars)	(Per cent)		(Millions of dollars)	(Per cent)	
Atlantic	167.4	4.51	0.37	170.6	3.83	0.30
Quebec	870.9	6.10	0.50	918.9	5.44	0.44
Ontario	1,489.7	6.65	0.51	1,537.4	5.62	0.42
Prairies	371.2	4.15	0.33	376.0	3.72	0.29
Pacific	248.7	4.29	0.34	263.3	3.68	0.28
Canada	3,147.9	5.71	0.45	3,266.3	4.95	0.38
Duties	900.3	1.63		970.7	1.47	
Net cash cost	2,247.6	4.08		2,295.6	3.48	

1 As a share of personal income.

Source: Based on industrial disaggregations in Tables D-4 to D-8.

The tax on final users attributable to the tariff (area GJYW) accrues to Canadian producers in the form of "subsidy-equivalents" or to the government as tariff revenue. From the point of view of any one region, the fundamental question about these transfers is whether the net balance between the gross cash costs paid by its residents and the ultimate transfer receipts of its producers is positive or negative.

Interregional Tariff Transfers

The measurement of a region's net balance on tariff transfers is complicated, for first-round transfers are dissipated in the payment of premiums on interregional trade in intermediate goods and the government's duty receipts revert to the regions. These transfers were, therefore, analysed in two stages: first, the gross cash costs to final users were allocated to producers in the five regions as first-round transfers; then these estimates were extended to incorporate the second-round effects of trade in intermediate goods, on the basis of a value-added approach that was built upon the effective rate of protection in each industry. Regional balances for these two sets of transfers are reported inclusive and exclusive of the redistribution — incorporated on the basis of a simple per capita assumption — of federal duty receipts.

Estimates of the amount and direction of first-round tariff transfers in 1970, summarized in Table 3-3, substantiate well-established relationships.[14] Most of the gross cash costs paid by final users in the Atlantic region (51 per cent), the Pacific region (49 per cent), and the Prairies (44 per cent) were first-round transfers to producers located elsewhere in Canada. The proportion of gross cash costs transferred to producers outside in Ontario and Quebec, was considerably lower at 6 and 10 per cent respectively. Producers in Ontario and Quebec were the principal recipients of these transfers, with Ontario producers taking almost three-quarters of them. A more surprising finding is that, while 50 per cent of the gross cash cost paid by final users in Ontario stayed in the region, the comparable figure for Quebec was 63 per cent. This difference between the two recipient regions is due in part to the first-destination reporting of imports into Ontario, but it also suggests that producers in Quebec are particularly reliant upon intraregional transfers.

14 In the estimating procedure, final demand and availability (local supply plus imports) by industry were based on regional data on shipments, exports and imports. Interregional flows, either positive or negative, were derived from the difference between local demand and local availability. The tariff markup was then applied to each component of each region's final demand: local supply, interregional supply, and foreign supply. The industry breakdown of the final demand of each region among locally produced goods, interregional imports, and imports from abroad is presented in Tables D-1 and D-2. Associated tariff transfers are shown in Tables D-3 and D-4.

Table 3-3

Distribution of the Gross Cash Cost[1] as First-Round Tariff Transfers, by Region, 1970

	Total tariff transfers				Per capita transfers		
	To local producers	From region	To region	To government	To local producers	Net interregional	To government
	(Millions of dollars)				(Dollars per capita)		
Atlantic	92.6	112.5	7.6	23.3	45.90	−51.95	11.53
Quebec	764.8	83.0	237.6	225.8	127.16	+25.71	37.56
Ontario	1,083.2	82.2	410.0	599.6	141.83	+42.98	78.52
Prairies	237.5	222.3	12.4	52.8	67.42	−59.60	15.00
Pacific	117.5	172.8	4.8	69.1	53.73	−76.86	31.62

1 Note that the sum of the first column less the third plus the second and fourth columns is equivalent to the gross cash cost for each region in Table 3-1.

Source: Based on industrial disaggregations in Table D-4.

Table 3-4 indicates some significant differences in the rate of the tariff transfers to producers in the central regions. The weighted average tariff markup on Quebec production of finished products (16.1 per cent) is the highest of any region and, in 1970 was a full 10 per cent higher than that in Ontario (14.6 per cent). Using either approach to the measurement of the transfers, the weighted markup rate on Quebec's interregional exports of finished goods was higher than the markup rate on production, while the corresponding figure in Ontario was lower. The markup rate on Quebec's interregional exports of finished goods alone ran anywhere from 18 to 30 per cent higher than that for Ontario. Yet the transfer receipts on interregional exports as a share of the total transfers received by local manufacturers were still about a third lower in Quebec than in Ontario. These findings reinforce the conclusions in Chapter 2 that pointed to Quebec's greater reliance on intraregional trade and the dependence of that province's producers on Canada's highest tariff rates.

To compute the net balance on first-round transfers, the total transfer receipts of local producers in Table 3-3 were deducted from the gross cash costs paid by local users in Table 3-1. The figures in Table 3-5 show the results after the incorporation of a correction for excess duty payments. This technical correction involves shifting a specific amount of the estimated federal duty on final imports back to local producers — deemed the most likely recipients — when it exceeds the actual duty recorded for a region's total imports. Large "excess duty payments," principally in the transportation equipment industry, arise because of the simplicity of our tariff markup assumption.[15] To omit this correction for excess duties, as in Table 3-3, radically understates the transfer receipts of the transportation equipment producers, for example, and thus the net transfer receipts of Ontario.

Much of the regional imbalance on first-round tariff transfers takes the form of federal government receipts, which are ultimately returned to the regions in the form of government services or lower taxes. Table 3-6 illustrates, for the main approach, the net balance on first-round transfers after the return of federal duty. Simply on the basis of first-round tariff transfers, these figures show that Ontario and Quebec recover more than the full cash cost of the tariff as transfers to their producers, government services, or lower taxes. The other regions are left with a substantial deficit. Ontario receives a larger surplus on both an absolute and a per capita basis than Quebec because of the correction for excess duties paid.

15 The assumption is that domestic producers price up to the tariff, where the tariff is taken to be the ratio of duties to dutiable imports. In three notable industries — transportation equipment, machinery, and the miscellaneous group — estimated duty on "final" imports far exceeds the duty actually reported (see Table D-9). This occurs where goods were imported free of duty under special arrangements, such as the Auto Pact, or for specific end-uses. But it also arises from the technique for estimating final imports and the accompanying assumption that all these final imports were subject to duty.

Table 3-4

Comparison of the Rate of First-Round Tariff Transfers to Producers in Ontario and Quebec, Two Approaches, 1968 and 1970

	Main approach				Alternative approach			
	Ontario		Quebec		Ontario		Quebec	
	1968	1970	1968	1970	1968	1970	1968	1970
	(Per Cent)							
Weighted mark upon final production	15.3	14.6	16.5	16.1	15.3	14.6	16.5	16.1
Rate of total transfer receipts on interregional exports	13.9	13.2	18.3	17.9	14.8	14.4	18.8	17.6
Proportion of all transfer receipts coming from interregional exports	40.2	37.9	28.0	31.1	18.7	16.7	13.3	14.5

Table 3-5

Net First-Round Transfers,[1] Two Approaches, by Region, 1968 and 1970

	Main approach		Alternative approach	
	1968	1970	1968	1970
	(Per cent of personal income)			
Atlantic	-3.37	-2.83	-2.17	-1.70
Quebec	-0.30	-0.21	-0.68	-0.70
Ontario	-0.50	-0.09	-0.44	-0.58
Prairies	-3.03	-2.43	-1.47	-1.20
Pacific	-3.62	-3.28	-2.20	-2.00

1 Incorporating correction for excess duty paid (Table D-9), but excluding return of federal duty.

Table 3-6

Net First-Round Transfers,[1] Total and per Capita, by Region, 1968 and 1970

	Total		Per capita	
	1968	1970	1968	1970
	(Millions of dollars)		(Dollars)	
Corrected for "excess duty payments"				
Atlantic	-73.4	-67.7	-36.68	-33.55
Quebec	111.1	138.5	18.74	23.03
Ontario	300.0	244.9	41.10	32.07
Prairies	-181.2	-144.0	-52.41	-40.87
Pacific	-156.8	-171.7	-76.38	-78.54
Uncorrected for "excess duty payments"				
Atlantic	-40.6	-36.5	-20.29	-18.06
Quebec	169.8	201.8	28.65	33.56
Ontario	143.2	75.4	19.60	9.87
Prairies	-145.0	-102.8	-41.94	-29.18
Pacific	-127.4	-137.8	-62.06	-63.05

1 Includes federal duty returned, amounting to $43.40 per capita in 1968 and $45.41 per capita in 1970, when uncorrected for excess duty paid; corrected totals are lower at $25.86 and $28.92, respectively.

Source: See Tables 3-3, and D-1 through D-4.

It would be inappropriate, however, to use the foregoing estimates of the regional net balances on first-round tariff transfers as indicators of the cost rebate each region might expect from the removal of the tariff. While suggesting the size of the total tariff transfers, these estimates do not show how they were ultimately distributed among the regions. To discover this, the second-round interregional leakage that results from intermediate transactions between producers in different regions must be determined.[16] In the absence of a suitable interregional input-output table, the ultimate transfer receipts of Canadian producers — first- and second-round transfers — were approximated by estimating the markup of the actual, over the world price valuation of, manufacturing value added in each region, using effective rates of protection for each industry (see Table 3-7). This value-added approach, despite weaknesses,[17] upholds the expectation that second-round transfers add to the transfer receipts of Ontario and Quebec, and that the Prairies and the Atlantic region lose substantially on second-round transfers. Rather surprisingly, the Pacific region emerges as a beneficiary of second-round transfers.

Table 3-7

Ultimate Transfer Receipts,[1] by Region, 1970

	First-round[2] receipts		First- and second-round receipts	
	(Millions of dollars)	(Per cent share)	(Per cent share)	(Millions of dollars)
Atlantic	92.6	4.1	3.1	72.5
Quebec	764.8	33.3	33.9	777.9
Ontario	1,083.2	47.2	49.8	1,142.3
Prairies	237.5	10.3	7.2	165.0
Pacific	117.5	5.1	6.0	137.9
Canada	2,295.6	100.0	100.0	2,295.6

1 Obtained by multiplying the value added in each industry (after correction for exports) by $t_f/1 + t_f$ where t_f was the effective rate of tariff protection received by that industry. The value added in each region was corrected for exports by multiplying by $1 - x/p$, where x was the region's exports and p the region's shipments. The calculations were made at the three-digit SIC level with the value-added figures for 1970 and the Chand and Salley effective rates for 1965. Since the transfers obtained by this value-added approach exceeded those derived from the final-demand approach, the regional shares from the former (column 3) were applied to the total transfers (before correction for excess duty) previously estimated. U. K. Chand and J. B. Salley, "Measurements of Effective Rates of Tariff Protection of Canadian Manufacturing Industries," Department of Finance, Working Paper 7203, presented to the Canadian Economics Association, Montreal, June 1972.

2 See Table 3-3.

16 First-round tariff transfers are redistributed as tariff-induced premiums on trade in intermediate goods and duty on intermediate imports, and in the higher cost of productive services.

17 For instance, it ignores the leakage of tariff transfers into the primary and tertiary sectors.

This analysis of interregional tariff transfers leads then to the conclusion that around 60 per cent of the gross cash cost paid by final users in the Atlantic region, the Prairies, and the Pacific region (from Table 3-1) does not ultimately revert to those regions (see Table 3-8). The comparable figures for Quebec and Ontario depend upon whether the correction for excess duty is incorporated. With inclusion of this correction, Quebec loses a mere 3 per cent of its gross cash cost, while Ontario derives a net surplus. The alternative approach reduces the unrequited shares of the smaller gross cash costs (GCC in Table 3-2) in the Atlantic and Pacific regions to 50 per cent and leaves both Quebec and Ontario with a net deficit on tariff transfers.

When the estimated duty receipts of the federal government are redistributed on a constant per capita basis, the data indicate that the central regions receive a premium of around 20 per cent of their gross cash costs, while the other regions forfeit about 40 per cent of theirs. According to the main approach, Ontario and Quebec obtained surpluses on tariff transfers in 1970 amounting to $40 and $25 per person, respectively. The deficits experienced in the other regions were substantial: Pacific region, $69; Prairies, $61; and the Atlantic region, $43. The alternative approach leads to the same conclusions, but the surpluses and deficits as a percentage of personal income are reduced by around 60 per cent, and the unrequited gross cash costs by half.

Devaluation and Tariff Transfers

One cannot, unfortunately, conclude that these net interregional tariff transfer deficits (surpluses) would simply be translated into regional rebates (losses) once the tariff is removed. Unilateral tariff removal would almost certainly have to be accompanied by devaluation of the Canadian dollar.[18] It is therefore necessary to correct our estimates to take account of the world prices that would prevail in Canada in the absence of the Canadian tariff.[19] In this section an illustrative devaluation of 10 per cent combined with a simplifying assumption about imported inflation and higher price of exportables is incorporated into the analysis.

18 See Chapter 4.

19 The net tariff markup rates (incorporating the effects of devaluation) which are appropriate for tariff removal are given by: $nt_i' = \frac{t_{ni} - d}{1 + t_{ni}}$ where t_{ni} = the ratio of duties to dutiable imports, d = the devaluation rate. This technique was derived from W. M. Corden, *The Theory of Protection* (Oxford: Clarendon Press, 1971), pp. 107-109, and from J. Bergsman, *Brazil: Industrialization and Trade Policies* (Oxford: Oxford University Press, 1970), pp. 45-47. The net tariff protection rate in Corden is $t - d/1 + d$, which is the same as Bergsman's r/r' $(1 + t) - 1$. Since r = the actual exchange rate and r' = the free trade rate, then $r/r' = 1/1 + d$, expressed here as $nt/1 + nt$. Net interregional transfers resulting from devaluation-induced price rises in the economy are assumed to affect regions on an equal per capita basis and have therefore been ignored.

Table 3-8

Net Transfer Position, Two Approaches, by Region, 1970

	I[1]		II[2]		III[3]	
	Unrequited share of gross cash cost	Share of personal income	Unrequited share of gross cash cost	Share of personal income	Unrequited share of gross cash cost	Share of personal income
	(Per cent)					
Main approach						
Atlantic	-67.1	-3.32	-66.2	-3.28	-39.8	-1.97
Quebec	- 6.9	-0.34	-2.7	-0.13	18.1	0.90
Ontario	-15.6	-0.78	6.1	0.30	22.4	1.11
Prairies	-67.0	-3.32	-63.6	-3.15	-43.3	-2.14
Pacific	-61.1	-3.02	-60.5	-2.99	-42.7	-2.11
Alternative approach						
Atlantic	-57.5	-2.20	-56.3	-2.15	-22.1	-0.85
Quebec	-15.3	-0.83	-11.4	-0.62	7.5	0.41
Ontario	-25.7	-1.44	-6.5	-0.36	7.9	0.44
Prairies	-56.1	-2.09	-51.6	-1.92	-24.5	-0.91
Pacific	-47.6	-1.75	-46.8	-1.72	-22.8	-0.84

1 Uncorrected for excess duty and before return of duty.
2 Corrected for excess duty but before return of duty.
3 Corrected for excess duty and after return of duty.

Source: Based on Tables 3-1 and 3-2.

When the new tariff markup rates are applied to previous estimates of final demand by industry in 1970 (see Table D-2) the regional gross cash cost falls from 4.95 per cent of local personal incomes to 2.11 per cent or 57.4 per cent. The deadweight welfare loss attributed to the tariff declines by an even larger percentage — 77.5 per cent.

Incorporation of this correction for devaluation into the comparison of the weighted markup on the finished products of Quebec and Ontario in 1970 extends the margin in Quebec's favour from the original 10 per cent (16.13 per cent versus 14.57 per cent) to 20 per cent (7.85 per cent versus 6.56 per cent.) The transfer rate on Quebec's interregional exports rises from 35 per cent to 115 per cent higher than that for Ontario (from 17.86 per cent versus 13.16 per cent to 9.70 per cent versus 4.48 per cent). Devaluation reduces the positive net balance on first-round tariff transfers of Ontario to below that of Quebec. In the original computation (Table 3-3), net transfer receipts from interregional trade were $328.2 million for Ontario compared with $154.6 million for Quebec. With devaluation, these receipts decline to $97.9 million for Ontario and to $104.2 million for Quebec.

And in contrast with the figures in Table 3-4, the transfer receipts from interregional exports as a share of total first-round transfer receipts of Quebec producers rise from 31.1 per cent to 34.7 per cent. The corresponding figure for Ontario falls from 37.9 to 29.5 per cent.

Devaluation, therefore, radically reduces the size of the first- and second-round interregional transfers, but it also dramatically changes the regional shares of these transfers.[20] Table 3-9 reports the difference between the ultimate regional distribution shares "without devaluation" (Table 3-7) and those "with devaluation." The regions with the highest rates of protection and the greatest dependence upon the Canadian market — Quebec and the Prairies — emerge with increased shares of the transfers at the expense of Ontario.

The full effects of incorporating the devaluation are summarized in Table 3-10. This table shows that the net interregional transfers that result from the tariff are not as large as was first anticipated, with Quebec having, after all, more to lose from the termination of these transfers than Ontario. The rebate gains to the other regions from the removal of the tariff would be reduced to $38.4 million or $19.02 per capita in the Atlantic region, $58.3 million or $26.69 per capita in the Pacific region, and $87.0 million or $24.70 per capita in the Prairies. These would be even smaller under the alternative approach.

20 The figures were derived as described in the previous section, but with the incorporation of net effective protective rates and a new correction for excess duties. The net effective markup rates by industry (nt_{fi}) were otbained as follows: $nt_{fi} = t_{fi} \cdot d / 1 + t_{fi}$.

Table 3-9

Change in the Ultimate Share of Tariff Transfers with Devaluation,[1] by Region, 1970

	First-round difference	First- and second-round differences
	(Percentage points)	
Atlantic	−0.1	–
Quebec	2.1	1.4
Ontario	−2.1	−2.4
Prairies	0.3	0.9
Pacific	−0.2	−0.1

1 Share of transfers with devaluation less share without devaluation. For comparison, see percentage columns in Table 3-7.

A comparison of column 3 of Tables 3-8 and 3-10 shows the relatively small effect that devaluation has upon the net tariff transfer receipts of Quebec and the comparatively large effect it has on those of Ontario. This difference which is underscored in Table 3-11 is a function of Quebec's dependence on industries that are subject to Canada's highest tariffs. Ontario's producers are dependent on very much lower tariff rates, which more closely approximate the percentage devaluation that would accompany tariff removal.

Conclusion

Assuming that unilateral removal of the tariff would not result in a change in the exchange rate, the net cash cost of the tariff in 1970 would be in the order of 3.48 per cent of personal income. Cash costs are forced income transfers from consumers to producers that imply a further welfare loss equivalent to 0.38 per cent of personal income. Removal of the tariff would secure not only the return of this loss to consumers but would also eliminate the annual interregional transfers from consumers in one region to producers in another. Table 3-12 indicates the magnitude of these transfers. Both Quebec and Ontario, as expected, experience surpluses, but the giant share of them falls to Ontario.[21] The figures change quite dramatically with a 10 per cent devaluation of the Canadian dollar.

21 With the exception of those for the Pacific region, the estimates of the interregional transfers implied by the tariff are surprisingly similar to results recently published in an Ontario study, where net interregional transfers in 1974 were found to be, in millions, $296 in Ontario, $169 in Quebec, −$126 in the Atlantic region, — $212 in the Prairies and −$126 in the Pacific region. These figures were, of course, derived using a shipments approach and very different assumptions. As my analysis shows, the shipments approach leads to higher estimates of the total transfers. The difference shown here is 2.1 per cent ($9.5 million), which would have been higher if the estimating procedures have been applied to a common year. To conclude that Ontario receives 66.7 per cent of the total transfers and not 63.7 per cent reflects genuine differences in perception. See Ontario Treasury, *Interprovincial Trade Flows, Employment, and the Tariff in Canada,* Supplementary Material to the 1977 Ontario Budget (April 1977), p. 13.

Table 3-10

Net Transfer Position with Devaluation,[1] by Region, 1970

	I[2]		II[3]		III[4]	
	Unrequited share of gross cash cost	Share of personal income	Unrequited share of gross cash cost	Share of personal income	Unrequited share of gross cash cost	Share of personal income
	(Per cent)					
Atlantic	-65.3	-1.38	-64.0	-1.35	-40.8	-0.86
Quebec	4.2	0.09	7.6	0.16	25.8	0.55
Ontario	-13.7	-0.29	1.5	0.03	15.8	0.33
Prairies	-60.2	-1.27	-58.7	-1.24	-40.8	-0.86
Pacific	-57.7	-1.22	-54.2	-1.14	-38.6	-0.81

1 Main approach using an illustrative devaluation of 10 per cent.
2 Uncorrected for excess duty and before return of duty.
3 Corrected for excess duty but before return of duty.
4 Corrected for excess duty and after return of duty.

Table 3-11

Change in Net Interregional Tariff Transfers as a Result of Devaluation,[1] 1970

	Without devaluation	With devaluation	Decline in receipts
	(Per cent of personal income)		(Per cent)
Atlantic	-1.97	-0.86	56.3
Quebec	0.90	0.55	38.9
Ontario	1.11	0.33	70.3
Prairies	-2.14	0.86	59.8
Pacific	-2.11	-0.81	61.6

1 Main approach using an illustrative devaluation of 10 per cent and including federal duty returns.

Table 3-12

Interregional Tariff Transfers,[1] with and without Devaluation, by Region, 1970

	Without devaluation[1]		With devaluation[2]	
	Millions of dollars	Per cent of local incomes	Millions of dollars	Per cent of local incomes
Atlantic	-87.8	-1.97	-38.4	-0.86
Quebec	151.6	0.90	92.1	0.55
Ontario	303.9	1.11	91.5	0.33
Prairies	-216.5	-2.14	-87.0	-0.86
Pacific	-151.3	-2.11	-58.3	-0.81

1 Main approach, including return of federal duty.
2 Using an illustrative devaluation of 10 per cent.

Benefits to consumers from the removal of the tariff drop by 43 per cent, as the net cash cost falls to 2.11 per cent of personal income and the welfare loss from the tariff would drop to 0.09 per cent. Tariff removal with devaluation would terminate the net interregional transfers shown in Table 3-12.

This nontraditional analysis leads to the conclusion that, while Quebec and Ontario receive roughly comparable amounts of annual net transfers from the existing tariff system, when expressed as a proportion of local incomes, Quebec's transfer receipts are higher than those of Ontario. Use of local incomes as a standard of reference, of course, begs the important question of just how regional income levels would be affected by the removal of the tariff. Analysis of this complex issue in Chapter 4 tends to reinforce the perception that current interregional tariff transfer receipts represent an even larger proportion of expected

free trade income in Quebec than in Ontario. This conclusion is complicated, however, by potential migration and transitional unemployment. Here it is sufficient to conclude that tariff removal would increase purchasing power in all regions and that the Atlantic, Prairie, and Pacific regions would, by this means, be relieved of the net burden of subsidizing the protected producers of Quebec and Ontario.

4 Tariff Removal and Employment

Redeployment of labour and capital and the rationalization of plants to achieve economies of scale will generate the principal gains from tariff removal. They will also inevitably cause disruption although to varying degrees in different regions. Some short-term disruption is the price of restructuring for future dynamic benefits. What then can be said of the dimensions and the regional pattern this short-term disruption is likely to take?

The reader will recall that in Chapter 2 we surveyed manufacturing employment in each region, allocating its dependence among local, interregional, and foreign markets on the basis of productivity constants. From this, certain expectations about the regional distribution of job losses attributable to tariff removal were derived. The impact analysis in this chapter extends and elaborates upon these initial generalizations using a more complete model and applying more detailed regional manufacturing data at the three-digit level. Summary tables of the impact of tariff removal are included in the text at each stage of the analysis; details of the effects on each manufacturing industry are presented in Appendix E.

The usefulness of the conclusions derived in this chapter is, however, relatively restricted, since they emerge from a step-by-step examination of the implications of a rather simplified set of assumptions. The purpose of this exercise is to explore the effects on regional employment of a decision to remove the Canadian tariff, as it were, overnight. This unlikely premise is adopted to illustrate the type of restructuring each region would have to undergo, with a view to assisting those who must design the appropriate transitional framework.

The fundamental assumptions of this static analysis are that the short-run supply curves of firms are upward sloping; that competition from imports would quickly force Canadian prices down to world levels; and that monetary wage rates are inflexible downwards. These important assumptions will not be challenged until Chapter 5. This analysis of the regional impact of tariff removal examines the direct effects; the direct effects with devaluation; and the direct and indirect effects with devaluation.

Direct Effects of Tariff Removal

The three basic assumptions with respect to supply curves, prices, and wages imply that tariff removal would lead to a decline in the value of shipments of protected manufacturers, in the quantity of goods shipped, and in the number of workers employed.[1] It is often forgotten that tariff removal will have a price as well as quantity effect on the shipments of the protected firm, as exhibited in Chart 4-1. The crucial question for short-run analyses is to determine the appropriate elasticity of supply, which would depend upon the rationalizing decisions of firms and would undoubtedly vary among firms, industries, and regions.[2] In the following analysis two approaches — the shipments approach and the value-added approach — are employed to consider this question, with significantly different results.

As a first approximation of the initial direct regional effects, using the shipments approach, the fall in the value of each industry's shipments for local and interregional markets was computed, assuming that the domestic price would fall by the ratio of the nominal tariff rate to one plus that rate ($tn/1+tn$) and that a uniform shipments supply elasticity of one ($e = 1$) would be appropriate for all industries and all regions.[3] Exports to foreign markets were assumed to be unaffected and were therefore excluded. The resultant losses in regional shipments, which correspond to areas 1 and 2 in Chart 4-1, were converted into estimates of direct employment losses using the appropriate regional figure for industry shipments per employee in 1970. The findings are summarized in Table 4-1.

The protective effect of a tariff on the output of an industrial process depends, it is now generally agreed, more on the effective tariff rate than on the nominal rate. The effective rate is the percentage markup on the value added per unit of shipments that the nominal tariff permits.

1 In some instances, where a protected industry has been experiencing negative effective protection, an increase in shipments would accompany the removal of the tariff.

2 This elasticity of supply would encompass the degree to which firms are willing to sell below cost (i.e., subsidize labour) during the period of corporate rationalization.

3 Larger supply elasticities would bring greater losses:

$$-\Delta S_i^R = -tn_i/1 + tn_i \{S_i^R - X_i^R\} (1 + e + tn_i e/1 + tn_i),$$

where

$tn_i/1 + tn_i$ = drop in domestic price in industry i,
e = elasticity of shipments supply,
S_i^R = the shipments of industry i in region R, and
X_i^R = the foreign exports of industry i in region R.

Chart 4-1

Effects of Tariff Removal, Shipments Approach

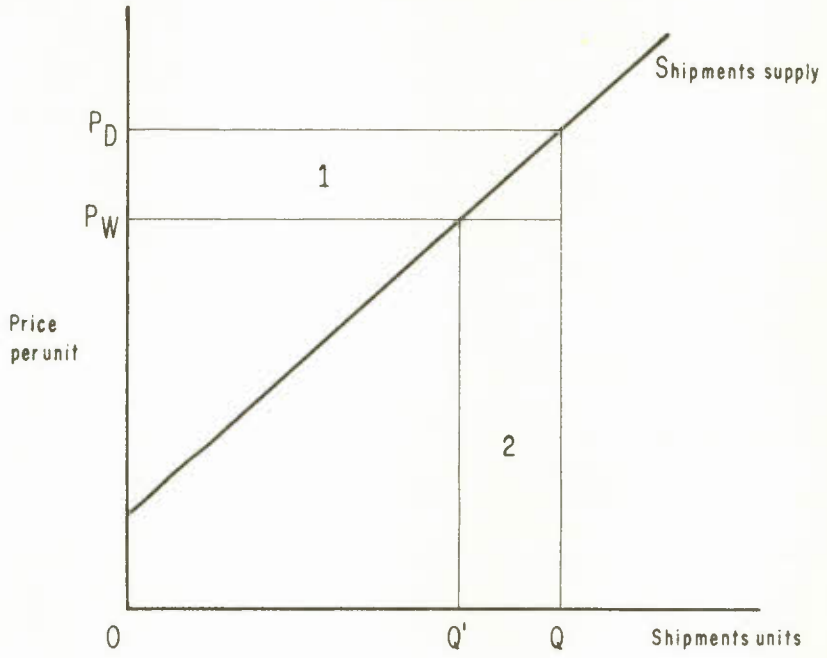


Chart 4-2

Effects of Tariff Removal, Value-Added Approach

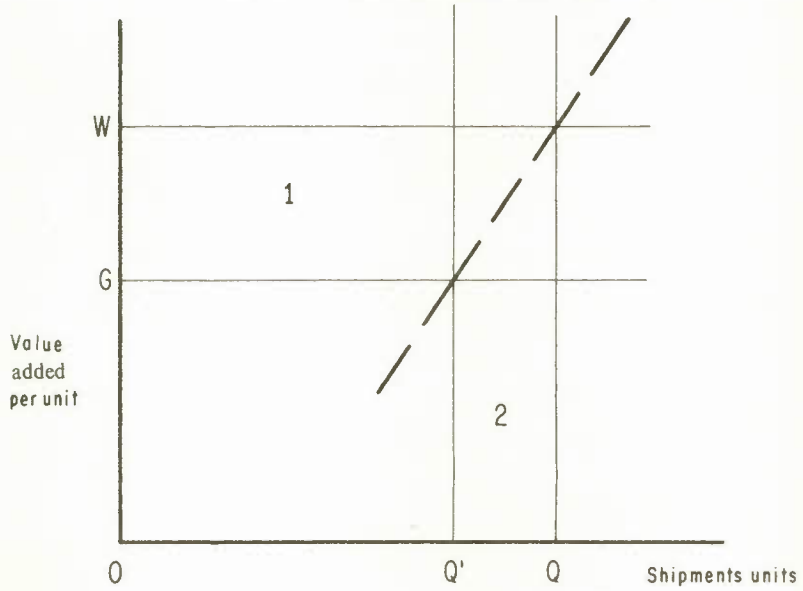


Table 4-1

Tariff Removal and Direct Employment Losses in Manufacturing,[1] Shipments Approach, by Region, 1970

	$e = 1.0$		
	Direct employment losses	Proportion of manufacturing employment	Proportion of total employment
	(Number of jobs)	(Per cent)	
Atlantic	8,349	14.00	2.21
Quebec	76,595	20.71	5.54
Ontario	105,083	18.67	5.25
Prairies	15,847	19.42	2.02
Pacific	11,663	12.53	2.18
Canada	217,537	18.64	4.23

1 Excluding the impact on distilleries, wineries, breweries, and all tobacco industries because of the excise content of the tariffs and incorporating a special single estimate for items covered by the Auto Pact, reduced by applying an import demand elasticity of −2 to Canada's imports from third countries in 1970.

Source: See Table E-1.

Therefore, the direct impact of tariff removal should also be derived using effective tariff rates, some assumed supply elasticity of value added, and the actual value added by industry in each region in 1970. This is referred to as the valued-added approach. The value-added effects have both a price and a quantity dimension. In Chapter 3 the value-added price effect was used to trace the ultimate regional distribution of the first- and second-round tariff subsidies. The quantity effects depend upon the appropriate supply elasticity of value added.

In Chart 4-2 GW/GO is the effective tariff rate (t_f), the markup over the world valuation of value added per unit of shipments. The supply elasticity of value added per unit of shipments (E) depends upon the elasticity of shipments supply (e). The direct impact of tariff removal on industry value added is computed as follows:[4]

$$
\begin{aligned}
&- g_i V_i && = \text{price effect,}\\
&- g_i V_i E_i[1 - g_i] && = \text{quantity effect, and}\\
&- g_i V_i(1 + E_i[1 - g_i]) && = \text{combined effect,}
\end{aligned}
$$

where

$$
E_i = e v_i^* \text{ and } g = t_{fi}/1 + t_{fi},
$$
$$
v_i^* = v_i/1 + g \text{ and } v_i = V_i/S_i,
$$

4 H. G. Johnson, "The Theory of Effective Protection and Preferences," *Economica*, XXXVI, No. 42 (May 1969), pp. 129-131.

with

g = the effective tariff reduction,
V = current value added (with protection),
S = current shipments (with protection),
E_i = the elasticity of supply of value added, and
e = the elasticity of supply of shipments.

The effective tariff reduction figures of Chand and Salley were applied to the value added by industry, by region, after the latter had been corrected for regional exports to foreign markets.[5] Because of lack of knowledge of the elasticity of supply of shipments in each region (e_i^R), a range of (short-term) elasticities was investigated. The price effects, by industry, represent large "losses" regardless of the elasticity chosen. The total direct impact effects on value added for each industry involve the summation of these price effects and the quantity effects derived for various elasticities. The figures then were converted into estimates of direct employment losses using the relevant region's value added per worker for each industry.

The figures in Table 4-2, which reveal the direct impact on manufacturing jobs from the loss of effective protection, are somewhat higher than those found using the shipments approach. With a supply elasticity of one ($e = 1$), the value-added approach suggested that manufacturing employment in Canada would fall by 20.0 per cent, or 233,000 jobs, while the shipments approach suggested a fall of 18.6 per cent, or 218,000 jobs.[6] In each case, most of the employment losses derive from the fall in "prices" (the price effect); thus the elasticity assumptions are of less importance than the price change assumptions.

Both of the estimating procedures indicate that Ontario would experience the largest direct impact losses in manufacturing employment. But Ontario's static employment losses, in both approaches, represent a proportionate loss of local manufacturing employment lower than the Canadian average, lower than that of the Prairies, and considerably lower than that of Quebec. The value-added approach, in contrast with the shipments approach, lowers Ontario's contribution to overall job losses in Canada and raises that of Quebec (see Table 4-3). These findings uphold the broad generalizations that were made in Chapter 2.

5 U. K. Chand and J. B. Salley, "Measurement of the Effective Rates of Tariff Protection of Canadian Manufacturing Industries," Department of Finance, Working Paper 7203 (1972), pp. 12-14.

6 The overall decrease in employment in each region can be computed from Table 2-1. A loss of 20 per cent of Canada's manufacturing employment ($e = 1.0$) corresponds to a loss of 4.5 per cent of total employment; a loss in manufacturing employment of 18.6 per cent corresponds to a loss in total employment of 4.23 per cent.

Table 4-2

Tariff Removal and Direct Employment Losses in Manufacturing,[1] Value-Added Approach with Various Elasticities, by Region, 1970

	$e = 0.5$		$e = 1.0$		$e = 1.5$		$e = 2.0$	
	Direct employment loss	Proportion of manufacturing employment	Direct employment loss	Proportion of manufacturing employment	Direct employment loss	Proportion of manufacturing employment	Direct employment loss	Proportion of manufacturing employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Atlantic	8,846	14.8	9,867	16.5	10,886	18.3	11,907	20.0
Quebec	76,559	20.7	85,751	23.2	94,432	25.5	103,109	27.9
Ontario	96,685	17.2	108,644	19.3	120,601	21.4	132,559	23.6
Prairies	14,408	17.7	16,028	19.6	17,651	21.6	17,994	22.1
Pacific	11,366	12.2	12,736	13.7	14,105	15.2	15,475	16.6
Canada	207,864	17.8	233,026	20.0	257,675	22.1	281,044	24.1

1 Excluding the impact on distilleries, wineries, breweries, and all tobacco industries because of the excise content of the tariffs and incorporating a special single estimate for items covered by the Auto Pact, reduced by applying an import demand elasticity of −2 to Canada's imports from third countries in 1970.

Source: See Tables E-2 to E-6.

Table 4-3

Tariff Removal and Regional Share of Direct Employment Losses in Manufacturing, Two Approaches, 1970

	Share of total manufacturing employment	Share of direct employment losses	
		Shipments approach	Value-added approach
		(Per cent)	
Atlantic	5.11	3.84	4.23
Quebec	31.69	35.21	36.80
Ontario	48.23	48.31	46.62
Prairies	6.99	7.28	6.88
Pacific	7.98	5.36	5.47
Canada	100.00	100.00	100.00

Most of the job losses, according to both approaches, would arise in the clothing, textiles, metal fabricating, electrical products, and food and beverages industries. But the proportionate loss of employment in knitting mills, leather products, furniture and fixtures, and petroleum and coal product industries would be high (see Tables E-1 to E-6). It is not, however, appropriate to assume that elasticities will be the same in all industries or that they will be alike for the same industry in different regions. Some might prefer to prepare direct regional employment loss estimates by incorporating different elasticities for different industries using the details in Tables E-1 to E-6. It might be sensible, for instance, to follow the conclusions of Wilkinson and Norrie and use a higher elasticity of shipments supply for the five two-digit industries for which tariff removal woul spell negative returns to capital (leather, knitting mills, clothing, textiles, furniture and fixtures).[7] Some 56 per cent of the 1970 employment in these industries was in Quebec, while that region's share of employment in all other industries was only 26 per cent.[8] On the other hand, it might be more appropriate to assume, as suggested in Chapter 1, that the elasticity of shipments supply varried from region to region. If, for instance, one set *e* at 1.0 to 1.5 in Quebec, 1.5 in the

7 Petroleum and coal products are also included by Wilkinson and Norrie but with reservation. See B. W. Wilkinson and K. Norrie, *Effective Protection and the Return to Capital,* Economic Council of Canada (Ottawa: Information Canada, 1975), pp. 64-65. Another alternative might be to use high elasticity values for leather, textiles, knitting mills, and clothing industries, and low elasticities for primary metals, metal fabricating, machinery, and transportation equipment on the basis of ownership and oligopolistic market structures.

8 These few industries accounted for 33.6 per cent of the manufacturing employees in Quebec. The corresponding percentages in the other regions, in 1970, were: Prairies, 15.3; Ontario, 13.8; Atlantic, 6.1; and Pacific, 5.3.

Prairie, the Atlantic, and the Pacific regions, and 0.5 to 1.0 in Ontario, the resultant direct job losses would amount to from 23 to 26 per cent of manufacturing employment in Quebec, from 17 to 19 per cent in Ontario, 22 per cent in the Prairies, 18 per cent in the Atlantic, and 15 per cent in the Pacific region.

Whether the direct employment losses in Canadian manufacturing that would result from tariff removal are derived from a shipments or a value-added approach using uniform elasticity of supply assumptions, as in Tables 4-1 and 4-2, or variable elasticity assumptions, their size and regional distribution give cause for alarm. But the picture that emerges from the foregoing exercise is bleak largely because the hypothesized change in the tariff was not accompanied by any offsetting stimulus to employment.

Direct Effects of Tariff Removal with Devaluation

In this section, tariff removal is combined with an illustrative devaluation of 10 per cent ($d = 0.10$), since, in all probability, this would reflect the type of regional adjustment in manufacturing that would have to accompany even a multilateral movement towards free trade.[9] With unilateral tariff removal, devaluation would provide the stimulus to exports that would derive from the accompanying removal of foreign tariffs under a multilateral agreement.

To retain flexibility in the choice of elasticities, the direct effect of devaluation on manufacturing employment is considered in two stages. The first involves the recomputation of the estimates of direct job losses with the new tariff markups, corrected for devaluation; the second incorporates the offsets to job losses that result from the devaluation-induced increase in exports of manufactured goods. No attempt was made to estimate the direct employment effects outside the manufacturing sector. Table 4-4 summarizes the results of the first stage for both the shipments and the value-added approaches. The divergence in the impact effects that these two approaches now generate is striking. Total job losses were reduced by 65.2 per cent using the shipments approach and by only 30.5 per cent when the valued-added approach was used (see Table 4-5). As a consequence, the job losses under the value-added approach were more than double those derived by the shipments approach. The relative fall of the two sets of tariff markups account for this difference.[10] Note how poorly the Prairies fared relative to Ontario when the value-added rather than the shipments approach was adopted.

9 We shall not belabour this point, for there are obvious differences between the two situations that are taken up in Chapter 5. The precise amount of devaluation necessary to offset job losses would depend upon relevant domestic elasticities as well as foreign demand and supply and the indirect effects.

10 See Chapter 3 for an explanation of this finding.

Table 4-4

Tariff Removal and Direct Employment Losses in Manufacturing,[1] Two Approaches with Devaluation,[2] by Region, 1970

	Shipments approach $e = 1.0$		Value-added approach $e = 1.0$	
	Direct employment loss	Proportion of manufacturing employment	Direct employment loss	Proportion of manufacturing employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Atlantic	1,962	3.3	6,861	11.5
Quebec	32,045	8.7	62,661	16.9
Ontario	34,612	6.1	72,510	12.9
Prairies	4,389	5.4	10,893	13.3
Pacific	2,694	2.9	9,005	9.7
Canada	75,702	6.5	161,930	13.9

1 Excluding the impact on distilleries, wineries, breweries, and all tobacco industries because of the excise content of the tariffs incorporating a special single estimate for items covered by the Auto Pact, reduced by applying an import demand elasticity of −2 to Canada's imports from third countries in 1970.
2 $d = 0.10$. Excluding the impact of induced exports.

Source: See Tables E-7 to E-12.

Table 4-5

Reduction in Direct Employment Losses in Manufacturing,[1] with Tariff Removal Accompanied by Devaluation,[2] Two Approaches, by Region, 1970

	Value-added approach	Shipments approach
	(Per cent)	
Atlantic	30.5	76.5
Quebec	26.9	58.2
Ontario	33.9	67.1
Prairies	32.0	72.3
Pacific	29.3	76.9
Canada	30.5	65.2

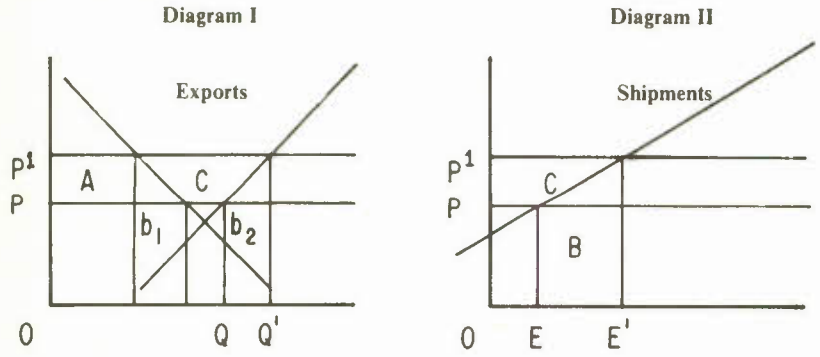
1 Excluding the impact on distilleries, wineries, breweries, and all tobacco industries because of the excise content of the tariffs and incorporating a special single estimate for items covered by the Auto Pact, reduced by applying an import demand elasticity of −2 to Canada's imports from third countries in 1970.
2 $d = 0.10$. Excluding the impact of induced exports.

Source: Based on Tables 4-1 to 4-3.

Because devaluation fails to reinstate the effective protection from foreign competition forefeited with the removal of nominal tariffs, regions whose employment is most dependent upon high effective rates obtained very little respite. Table 4-5 shows that the proportionate reduction in job losses as a result of devaluation was lowest in the high-tariff region of Quebec. Losses would be substantially higher in Quebec than Ontario, if interregional differences in supply elasticities were applied (see Tables E-8 to E-12).

In the second stage of this analysis, estimates were made of job losses offset by the devaluation-induced increase in exports. Once again, it was necessary to specify elasticities. The approach chosen here was a hybrid one. In those industries with a revealed capacity to export, devaluation was assumed to increase the value of domestic shipments by two components: first by the increase in the value of exports (price and quantity effects); and second, by the rise in the value of shipments for domestic use.[11] While up until this point foreign exports were abstracted from domestic supply curves, now the current exports by industry for each region are used to generate empirical estimates for job-loss offsets employing the shipments approach. Two different elasticities of export

11 For an exporting firm in industry i and region R, traditional analysis would depict the increase in the value of exports that results from the devaluation as areas B and C, in Diagram II. With $d = PP^1/OP = 0.10$, S_x = elasticity of export supply, and X^{70} = area OP.OQ, the change in the value of exports, ΔX (area B+C), would be $X^{70}(S_x+dS_x)$. This is the first component used in the computation of offsets to job losses.



But Diagram II is derived from the more detailed information of domestic demand and supply, depicted in Diagram I. Inspection of Diagram I reveals that the full implications of the devaluation for shipments are not captured in Diagram II. Area A is in fact an increase in the value of shipments. Area B is equal to areas b_1 and b_2, but area b_1 is not an increase in the value of shipments. The change in the value of exports, ΔX, understates the shipments impact of the devaluation by the difference between areas A and b_1. The importance of this difference depends on the ratio of exports (X^{70}) to shipments (S^{70}). As a second component of the increase in shipments associated with devaluation, the value of shipments for domestic use was raised by specific proportions of the devaluation percentage, with these price effects varying discretely according to the ratio X/S. For the relevant export shares, by industry and region, see Appendix C.

(excess) supply (S_x) were used.[12] Difficulties in estimating the second component precluded generation of the job-loss offsets for the value-added approach.

Table 4-6 summarizes the estimation of the job-loss offsets using the shipments approach. The small offset in the Prairies was to be expected from the small share of production exported (see Table 2-2). The smaller offset in Ontario than in Quebec results from the freeze introduced for Auto Pact items. Table 4-7 shows complete estimates of the direct impact on manufacturing employment of the removal of the tariff and devaluation. These estimates are the net effect of the job losses and the job-loss offsets using both the shipments approach and a compromised value-added approach.[13]

Table 4-6

Direct Manufacturing[1] Employment Losses Offset by Devaluation-Induced Increases in Exports,[2] Shipments Approach, by Region, 1970

	$S_X = 1$		$S_X = 2$	
	Employment losses offset	Proportion of manufacturing employment	Employment losses offset	Proportion of manufacturing employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Atlantic	4,120	6.91	6,069	10.18
Quebec	15,249	4.12	22,126	5.98
Ontario	19,026	3.38	27,442	4.88
Prairies	2,319	2.84	3,380	4.14
Pacific	9,078	9.75	13,356	14.35
Canada	49,792	4.27	72,373	6.20

1 Excluding the impact on distilleries, wineries, breweries, and all tobacco industries because of the excise content of the tariffs and incorporating a special single estimate for items covered by the Auto Pact, reduced by applying an import demand elasticity of −2 to Canada's imports from third countries in 1970.
2 $d = 0.10$.

Source: See Tables E-13 and E-14.

12 The larger elasticity better represents the expectation that devaluation would not only increase the value of current exports, which are largely resource-intensive products, but would also encourage the further processing of some crude materials that were previously exported directly. S. Magee, "The Welfare Effects of Restrictions on U.S. Trade," in *Brookings Papers on Economic Activity*, No. 3 (1972), p. 353.

13 Compromised, because job losses were computed on the basis of value added per worker, and the offsetting gains were calculated using shipments per worker a method that understates the job-loss offsets.

Table 4-7

Net Direct Effect on Manufacturing[1] Employment of Tariff Removal with Devaluation,[2] Two Approaches, by Region, 1970

	Shipments approach				Compromised value-added approach			
	$S_X = 1$		$S_X = 2$		$S_X = 1$		$S_X = 2$	
	Net change in employment	Share of manufacturing employment	Net change in employment	Share of manufacturing employment	Net change in employment	Share of manufacturing employment	Net change in employment	Share of manufacturing employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Atlantic	2,158	3.6	4,107	6.9	−2,741	4.6	−792	−1.3
Quebec	−16,796	−4.5	−9,919	−2.7	−47,412	−12.8	40,535	−11.0
Ontario	−15,586	−2.8	−7,170	−1.3	−53,484	−9.5	−45,068	−8.0
Prairies	−2,070	−2.5	−1,009	−1.2	−8,574	−10.5	−7,513	−9.2
Pacific	−6,384	6.9	10,662	11.4	−73	−0.8	4,351	4.7
Canada	25,910	−2.2	−3,329	−0.3	−112,284	−9.6	−89,557	−7.7

1 Excluding the impact on distilleries, wineries, breweries, and all tobacco industries because of the excise content of the tariffs and incorporating a special single estimate for items covered by the Auto Pact, reduced by applying an import demand elasticity of −2 to Canada's imports from third countries in 1970.

2 $d = 0.10$; $e = 1.0$.

Source: See Tables E-7 to E-14.

With standardized assumptions about elasticities, the shipments approach suggests that removal of tariffs and a 10 per cent devaluation would lead to a net growth in manufacturing shipments and a small net decline in manufacturing employment.[14] The direct effects of this policy on regional employment generally confirm the expectations expressed in Chapter 2 that manufacturing employment in the Atlantic and Pacific regions — those most oriented towards foreign markets — would rise; manufacturing employment in Quebec and the Prairies, — the regions with the greatest employment dependence on interregional trade and the greatest employment dependence on industries with really high tariffs — would fall; and that the effects on manufacturing employment might be more disruptive in Quebec than in other regions.

In the generalizations in Chapter 2 net job losses in Ontario's manufacturing sector were understated because of the size of the contribution of Auto Pact exports to its employment base. Restrictions introduced in this chapter on the responsiveness of these exports to devaluation have drastically limited the number of job-loss offsets predicted for Ontario.

According to the now-compromised value-added approach, the devaluation that accompanied tariff removal would bring less relief from dislocation in manufacturing than was predicted by the shipments approach, particularly in the Prairies and in Quebec.[15] The value-added approach, without use of differential regional elasticities, shows the absolute number of jobs lost would be higher in Ontario than Quebec. But in proportionate terms the net losses, and quite probably the disruption, would turn out to be highest in Quebec and the Prairies.

The extent of the disruption in the post-devaluation situation would vary among industries in different regions. The net direct job losses in the five industries shown in Table 4-8 would account for most of the direct job losses in Quebec and many of the losses in the other two regions. These figures are based on the shipments approach (with $S_x = 2$) somewhat larger losses are obtained on the basis of the value-added approach. The reader can explore the implications of adopting different elasticity assumptions by combining Tables E-9 and E-10 with E-13 and E-14.

In conclusion, the figures suggest that a policy of tariff removal and a 10 per cent devaluation would result in net losses of manufacturing employment in all regions of Canada. But there is a more positive aspect to these net losses in employment. Devaluation and tariff removal, with

14 The disaggregated Tables E-8 through E-14 outline the repercussions in particular industries and regions, the result from adopting the value-added approach, rather than the shipments approach, and from varying the elasticities among regions.

15 By contrasting the changes of Table 4-7 with those in Tables 4-9 and 4-2, one can see the turnaround in the direct impact on local manufacturing employment from the predevaluation situation.

Table 4-8

Net Direct Employment Losses in Manufacturing[1] Employment in Selected Industries in Quebec, Ontario, and the Prairies, Shipments Approach, [2] 1970

	Quebec		Ontario		Prairies	
	Share of industry employment	Employment loss	Share of industry employment	Employment loss	Share of industry employment	Employment loss
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Clothing	9,353	16.7	3,623	17.5	1,198	15.7
Textiles	4,376	14.7	3,575	15.0	178	15.5
Metal fabricating	1,229	4.5	3,592	5.8	555	6.7
Knitting mills	2,421	19.1	1,251	20.1	40	12.7
Furniture and fixtures	1,486	10.7	1,676	1.4	309	12.0
Leather products	1,996	16.4	1,153	10.7	72	8.8
	20,861		14,870		2,352	

1 Excluding the impact on distilleries, wineries, breweries, and all tobacco industries because of the excise content of the tariffs and incorporating a special single estimate for items covered by the Auto Pact, reduced by applying an import demand elasticity of −2 to Canada's imports from third countries in 1970.

2 $d = 0.10; S_X = 2$.

Source: See Tables E-7 to E-14.

our assumptions, would be associated with overall growth in manufacturing shipments of 0.3 per cent when export elasticity is taken as 1 ($S_x = 1$) and 2.3 per cent when it is assumed to be 2 ($S_x = 2$).[16] Thus it can legitimately be argued that such a policy would increase the efficiency of Canada's manufacturing sector. Indeed, the figures derived for Table 4-7, even though they are based on constant productivity assumptions for each industry in each region, give support to those who claim that tariff removal would raise the average productivity per worker in the low productivity regions up towards the national average. For instance, in Table 2-1, we noted that Quebec accounted for 28.4 per cent of Canada's manufacturing shipments and for 31.7 per cent of Canada's manufacturing employment. The spread between these shares was similar in Ontario, but with a different sign. Table 4-9 reveals that these differentials would narrow simply as a result of the structural changes in the pattern of manufacturing implied by the direct effects of tariff removal.[17]

Table 4-9

Direct Effects of Tariff Removal with Devaluation[1] on Regional Shares of Manufacturing Shipments and Employment, 1970

	Actual share		Shares differences[2]		
	Shipments	Employment	Actual	$S_X = 1$	$S_X = 2$
	(Per cent)		(Percentage points)		
Atlantic	3.82	5.11	−1.29	−1.38	−1.40
Quebec	28.45	31.69	−3.24	−2.72	−2.62
Ontario	51.83	48.23	3.60	3.22	3.15
Prairies	7.82	6.99	0.83	0.93	0.93
Pacific	8.08	7.98	0.10	0.05	−0.06
Canada	100.00	100.00	–	–	–

1 $d = 0.10; c = 1.0$.
2 Shipments minus employment.
Source: See Tables 2-1 and 4-7.

Such findings beg the question whether the increase in productivity in Canada's manufacturing and the decline in productivity differentials would provide sufficient solace to those regions that must bear the brunt of the lost jobs in manufacturing. But this question in itself ignores the fact that regional job losses offer potential for further output growth, if

16 A subsequent footnote on the consistency of the size of the assumed devaluation and the assumed elasticity values for e and S_x argues that the 2.3 per cent growth of shipments in manufacturing may be too high because of excessive devaluation.

17 The striking exception to this convergence of shares is in the Atlantic region, where increased employment would, with our simplified productivity assumptions, be associated with a lowering of average productivity in manufacturing.

transitional policies can secure employment opportunities for those displaced. The next section analyses the degree to which the indirect effects of the hypothesized policy changes would reinforce or undermine the conclusions derived from the direct impact effects. The question of transitional policies is taken up in the final chapter.

Direct and Indirect Effects of Tariff Removal with Devaluation

The direct impact of particular policy changes set off indirect effects that operate through supply and income relations and reverberate among all industries in the economy. It is not, therefore, inconceivable that the effects of the devaluation-induced exports in outlying regions might ultimately redound to the benefit of Ontario and Quebec in the form of indirect offsets to job losses.

It is customary in impact analyses to use an input-output model to derive the indirect impact effects. But the implicit assumption behind such models — that the coefficients for inputs, demand, and sources of supply are fixed — is not well-suited to our particular task, because tariff removal accompanied by a devaluation would undoubtedly bring major changes or substitutions in patterns of inputs, demand, and regional sources of supply. The only apparent way to proceed was, nevertheless, to extrapolate with caution from known input-output relationships.

The direct effects on shipments by industry and region, specified in Table 4-7, were imposed on an interregional input-output model.[18] This exercise for tracing the indirect impact effects by region was performed for each of the two export supply elasticity assumptions, $S_x = 1$ and $S_x = 2$, and the results were converted to employment effects using the relevant regional figures for shipments per worker in 1970.

The previous conclusion that, in the aggregate, Canada's manufacturing shipments would increase, while manufacturing employment would fall, is sustained by the incorporation of the indirect effects of the hypothesized policy changes. However, the indirect effects would raise the manufacturing job losses when $S_x = 1$ and lower them when $S_x = 2$. Table 4-10 shows the percentage changes in manufacturing shipments and employment at the national level. The finding that the indirect effects would turn a direct impact loss of 2.22 per cent (25,900 jobs) into a 2.93 per cent loss (34,200 jobs) in the $S_x = 1$ case, and a loss of 0.29 per cent (3,300 jobs) into a 0.48 per cent gain (5,300 jobs) in the $S_x = 2$ case, emphasizes the importance of tracking carefully the regional incidence of these indirect effects.

18 I am extremely grateful to Richard Zuker and the Department of Regional Economic Expansion for permission to use this interregional input-output model of the Canadian economy. Economic Development Analysis Division, Department of Regional Economic Expansion, *An Inter-Provincial Input-Output Model, Version III* (May 1976).

Table 4-10

Direct and Indirect Effects of Tariff Removal with Devaluation[1] on Manufacturing in Canada, Shipments Approach, 1970

	Growth in manufacturing	
	$S_X = 1$	$S_X = 2$
	(Per cent)	
Direct and indirect effects		
Shipments	0.04	3.57
Employment	−2.93	0.45
Direct effects		
Shipments	0.29	2.32
Employment	−2.22	−0.29
Indirect effects		
Shipments	−0.25	1.25
Employment	−0.71	0.74

1 $d = 0.10$; $e = 1.0$.

The direct and indirect effects on employment by region are shown in Table 4-11. But before elaborating on the regional differences, it is important to underscore two important points that also apply to the figures in Table 4-10. First, derivation of the indirect effects involved assumptions about the constancy of input-output coefficients that were not strictly appropriate to our task. After tariff removal, changing sources of supply alone would be expected to greatly reduce the size of the positive indirect impact. The second point involves the retention of the valuable perspective offered by the value-added approach.

In the previous section, it was necessary to compromise the value-added estimating procedure because of technical difficulties in incorporating the direct effects of induced exports. Since it was not feasible to insert the value-added changes into the interregional input-output table, the indirect effects could only be derived on a shipments basis. With some further loss of consistency, the total effects of a compromised value-added approach can be approximated by combining the figures for the direct employment effects in Table 4-7 and the indirect effects in Table 4-11.[19] Larger employment losses are generated by this approach, bringing the total of jobs lost to 106,508 or 2.07 per cent of total employment when $S_x = 1$ and to 34,927 or 0.68 per cent when $S_x = 2$ (see Tables 4-7 and 4-10).

19 According to both the shipments and the value-added approaches, the direct impact includes price and quantity effects. In the input-output table, it is largely the secondary quantity effects that we are tracking. Since these effects are common to our two approaches, the procedure adopted above is not as inappropriate as it appears at first.

Table 4-11

Direct and Indirect Effects of Tariff Removal with Devaluation,[1] Shipments Approach, by Region, 1970

	Direct effects on manufacturing[2]		Indirect effects on manufacturing		Indirect effects on nonmanufacturing		Total[3]	
	Change in employment	Proportion of manufacturing employment	Change in employment	Proportion of manufacturing employment	Change in employment	Proportion of local employment	Change in employment	Proportion of local employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Export supply elasticity = 1				$S_X = 1$				
Atlantic	2,158	3.62	464	0.78	3,625	0.96	6,247	1.65
Quebec	-16,796	4.54	-5,860	1.58	221	0.02	-22,435	1.62
Ontario	-15,586	2.77	-5,044	0.90	-2,170	0.11	-22,800	1.14
Prairies	-2,070	2.54	297	0.36	4,045	0.51	2,272	0.29
Pacific	6,384	6.86	1,856	1.99	8,196	1.53	16,436	3.07
Canada	-25,910	2.22	-8,287	0.71	13,917	0.27	-20,280	0.39

Export supply elasticity = 2					$S_X = 2$			
Atlantic	4,107	6.89	1,164	1.95	6,085	1.61	11,356	3.00
Quebec	−9,919	2.68	35	0.01	11,605	0.84	1,721	0.12
Ontario	7,170	1.27	3,145	0.56	8,857	0.44	4,832	0.24
Prairies	−1,009	1.24	970	1.19	6,531	0.83	6,492	0.83
Pacific	10,662	11.45	3,285	3.53	12,953	2.42	26,900	5.03
Canada	−3,329	0.29	8,599	0.74	46,031	0.90	51,301	1.00

1 $d = 0.10; e = 1$.

2 Excluding the impact on distilleries, wineries, breweries, and all tobacco industries because of the excise content of the tariffs incorporating a special single estimate for items covered by the Auto Pact, reduced by applying an import demand elasticity of −2 to Canada's imports from third countries in 1970.

3 Regional totals are for direct and indirect effects inclusive of the indirect effects upon employment in nonmanufacturing sectors. The direct effects are those derived for Table 4-7. No account has been taken of the possibly substantial direct effects of devaluation on the nonmanufacturing sectors, so that the last two columns show only the indirect impact of the changes in the first.

Source: See Tables E-15 to E-19.

The inclusion of the indirect impact on manufacturing employment, using the shipments approach, simply reinforced the previous perception that Quebec would suffer the most disruption from the hypothesized policy changes. When $S_x = 1$, Quebec's net manufacturing employment loss amounted to 6.12 per cent (22,700 jobs) while Ontario's was 3.67 per cent (20,600 jobs). In the $S_x = 2$ case, Quebec's manufacturing employment loss amounted to 2.67 per cent (9,900 jobs) and Ontario's was only 0.72 per cent (4,000 jobs), or less than half the predicted number of manufacturing job losses in Quebec. At the same time, inclusion of the indirect effects on manufacturing employment enhanced the gains in the Pacific and Atlantic regions and improved the relative situation predicted for the manufacturing sector of the Prairies. And finally tariff removal combined with devaluation might be expected to increase Canadian manufacturing shipments, while reducing productivity disparities between regions. Table 4-12 shows the differences between regional shares of Canada's manufacturing shipments and manufacturing employment after inclusion of the indirect effects and reveals a further narrowing of the differences observed in Table 4-9.

Table 4-12

Direct and Indirect Effects of Tariff Removal with Devaluation[1] on Regional Shares of Manufacturing, Shipments and Employment, 1970

	Share differences[2]				
		Direct impact		Direct and indirect impact	
	Actual	$S_X = 1$	$S_X = 2$	$S_X = 1$	$S_X = 2$
	(Percentage points)				
Atlantic	−1.29	−1.38	−1.40	−1.43	−1.41
Quebec	−3.24	−2.72	−2.62	−2.56	−2.45
Ontario	3.60	3.22	3.15	3.15	3.04
Prairies	0.83	0.93	0.93	0.92	0.91
Pacific	0.10	−0.05	−0.06	−0.08	−0.09

1 $d = 0.10$; $e = 1$.
2 Shipments minus employment.

Source: See Tables 4-9, and E-15 to E-19.

The industry-by-industry distribution of the indirect effects on manufacturing and nonmanufacturing in Tables E-15 to E-19 permits a number of significant comparisons between regions and industries. One that warrants detailed elaboration is the comparison of the *changes* in the direct and indirect impact on employment that occurs as the export supply elasticity is moved from 1 to 2 (see Table 4-13). This exercise reveals how the current input-output coefficients distribute the indirect

effects of a generalized increase in exports across the regions, which is interesting because it provides insights into the implications for the manufacturing employment of each region of further specialization in its revealed comparative advantage and because it encourages speculation about how this distribution would change when the input-output coefficients themselves respond to tariff removal. For the sake of brevity this exercise is confined to the experience of Ontario and Quebec.

Table 4-13

Increases in Manufacturing Employment Associated with Tariff Removal and Devaluation[1] and an Increase[2] in the Elasticity of Export Supply, by Region, 1970

	Direct impact	Indirect impact	Direct and indirect impact
		(Per cent)	
Atlantic	1.17	3.27	4.44
Quebec	1.59	1.86	3.44
Ontario	1.46	1.50	2.95
Prairies	0.83	1.30	2.13
Pacific	1.54	4.60	6.13
Canada	1.45	1.94	3.38

1 $d = 0.10; e = 1.0$.
2 $S_X = 1$ is assumed to increase to $S_X = 2$.

The assumed increase in export elasticities, and therefore the growth in exports, is associated with an increase of some 3,800 more manufacturing jobs in Ontario than in Quebec. This difference is composed of 1,500 jobs from the direct impact differential and 2,300 from the indirect impact differential (see Table 4-11). Nevertheless, because of the difference in the size of the manufacturing sectors in these two regions, the change in exports reduces the net manufacturing job losses in Quebec by 3.45 percentage points, while Ontario's losses are only reduced by 2.95 percentage points. The improvement in Quebec is 0.50 percentage point more than the improvement in Ontario, with 0.36 percentage point attributable to the direct effects, and a 0.14 to the indirect effects.

But there is an even simpler way of demonstrating that Quebec receives a disproportionate share of the increased manufacturing employment as $S_x = 1$ moves to $S_x = 2$. This involves deducting the regional shares of Canada's actual manufacturing employment in 1970 from the regional shares of the total direct and indirect employment increments predicted to result from the increased exports (see Table 4-14). These figures show that Quebec receives a larger share of the export-induced employment in Canada than its share of current manufacturing employment. Ontario's smaller share of the induced employment increments is totally explained by its low share of the direct employment effects; and this is largely due to the freeze on its Auto Pact exports. Quebec's share

of the direct employment effects is not as low, relative to its share of overall manufacturing, as Ontario's, and its share of the indirect effects is much higher. While the degree to which export changes in the rest of Canada indirectly generate job opportunities in the manufacturing sectors of the central regions may be less than some would suppose, the figures imply that it is nonetheless significantly large.

Table 4-14

Regional Share of the Increase in Total Employment Associated with an Increase[1] in the Elasticity of Export Supply

	Present distribution of employment[2]	Share of total increase		
		Direct	Indirect	Direct and indirect
Ontario	48.23	37.27	48.50	42.07
Quebec	31.69	30.45	34.91	32.36
Others	20.08	32.28	16.59	25.57

1 $S_X = 2 - S_X = 1$.
2 See Table 2-2.

Moving from the $S_x = 1$ case to the $S_x = 2$ case increases total manufacturing employment in Quebec by 3.44 per cent, in Ontario by 2.95 per cent, and in Canada by 3.38 per cent. Clearly, if higher export elasticities were assumed, the relatively distressed situation predicted for Quebec's manufacturing would have been somewhat less severe. But it is important to note that both region's shares of the direct employment effects of increased exports are lower than their shares of current manufacturing employment. On the other hand, Quebec, with 31.7 per cent of Canada's manufacturing employment, garners 34.9 per cent of the indirect employment effects in manufacturing from the increased exports; for Ontario, the figures are 48.2 per cent and 48.5 per cent, respectively. Since so much of the differential responsiveness of Quebec's manufacturing employment to a change in export elasticities is attributable to indirect effects, Table 4-15 has been constructed to reveal just where these differentials arise. The data show that in 10 of the 20 manufacturing industries, the percentage increase in employment attributable to the export-induced indirect effects was higher in Quebec than in Ontario.

In this section, we have attempted to follow the implications of including the indirect effects of tariff removal using an interregional input-output table. Table 4-11 shows that while this substantially improves the picture for Canada, the damage to Quebec's manufacturing sector relative to that of the other regions stands out dramatically. The conclusion that a generalized increase in exports would improve the manufacturing employment situation in Quebec relative to Canada rests

heavily on the assumption that existing input-output coefficients would remain unchanged. Juxtaposing the figures in Table 4-15 with the free-trade rates of return on capital and effective tariff rates for each industry reiterates the fundamental weakness of such an assumption.

Table 4-15

Relative Advantage Gained from the Indirect Employment Effects of Increased Exports, by Industry, Quebec and Ontario

	Quebec advantage[1]	Free trade return on capital[2]	Effective rate of protection[3]
	(Percentage points)	(Per cent)	
Clothing	.155	-7.36	44.8
Textiles	.088	-3.26	38.4
Paper and allied products	.054	6.75	30.9
Wood products	.039	2.17	20.1
Food and beverages	.027	1.32	31.7
Leather	.024	-16.10	49.9
Knitting mills	.015	-10.61	91.9
Tobacco products	.014	n.a.	n.a.
Furniture and fixtures	.005	-3.13	44.8
Petroleum and coal products	.004	-1.52	42.9
	Ontario advantage[1]		
Electrical products	.057	1.53	31.5
Transportation equipment	.050	6.41	2.0
Metal fabricating industries	.042	2.56	24.8
Primary metals	.042	5.10	16.0
Machinery	.033	14.05	6.8
Rubber	.026	1.63	33.1
Miscellaneous manufacturing industries	.011	7.01	6.9
Printing and publishing	.010	6.14	2.0
Chemicals	.009	4.68	13.8
Nonmetallic minerals	.005	7.54	15.7

1 See Tables E-15 to E-19.

2 B. W. Wilkinson and K. Norrie, *Effective Protection and the Return to Capital*, Economic Council of Canada (Ottawa: Information Canada, 1975), pp. 42-43.

3 U. K. Chand and J. B. Salley, "Measurement of Effective Rates of Tariff Protection of Canadian Manufacturing Industries," Department of Finance, Working Paper 7203 (1972), pp. 15-16.

n.a.: Not available.

Conclusion

Starting with some harsh assumptions, detailed data on the regional structure of manufacturing in 1970 — shipments, exports, value added, and per capita productivity — were combined with information on industry tariffs, at the Canada level, to test the simple expectations

derived in Chapter 2 about the differential impact of tariff removal on the five regions of the country. The implications of unilateral tariff removal for regional employment were considered in the light of the direct effects, the direct effects with devaluation, and the direct and indirect effects with devaluation. The broad conclusions of this analysis can be followed in Table 4-16.

Since the assumptions imply such large proportionate losses in Canada's manufacturing employment, a devaluation of the Canadian dollar was introduced into the analysis to generate offsets through an increase in manufactured exports. The actual size of the devaluation necessary to offset the job losses in manufacturing would depend upon the relevant export supply elasticities. The devaluation of 10 per cent used in this exercise may be somewhat large for consistency with the $S_x = 2$ assumption and too small for consistency with the $S_x = 1$ assumption.[20] However, the size of the appropriate devaluation is less important to us than the fair representation of the relative impact of tariff removal and devaluation on manufacturing employment in the three most vulnerable regions.

The direct impact of a generalized increase in exports, excluding Auto Pact items, would quickly lead to net employment increases in the export-oriented manufacturing sectors of the Pacific and Atlantic regions. The direct impact of tariff removal and devaluation would result in a net loss of jobs in the manufacturing sector of Quebec that, in proportionate terms, might run to more than double the loss in Ontario and the Prairies.

The disruption of tariff removal plus devaluation is made worse in Quebec's manufacturing sector relative to that in other regions by the adoption of a value-added approach that incorporates the loss of effective protection, by integrating the indirect effects on manufacturing into the analysis, by anticipating the implications of tariff removal upon existing input-output coefficients, and by integrating nonstandardized assumptions about elasticities of supply.

In Ontario's manufacturing sector, employment losses would be large in absolute numbers and increase with the value-added approach.

20 The increase in exports, expressed as a proportion of total manufacturing shipments in 1970, was 4.2 per cent with $S_x = 1$ and 6.3 per cent with $S_x = 2$. The fall in shipments with tariff removal and devaluation ($d = 0.10$) was 4.2 per cent, but approximately half of this was a price effect. The increase, therefore, in manufactured imports attributable to direct effects would be about 2.1 per cent. The influence of lower prices in increasing demand for imports plus the indirect effects, with corrected input-output coefficients, might bring a further 2 to 3 per cent increase in manufactured imports, but not as much as the further 4 per cent required for balanced increases in imports and exports with $S_x = 2$. Balanced increases in imports and exports with $d = 0.10$ and $S_x = 2$ could, of course, be redeemed using Wilkinson's assumption that a 1 per cent change in the Canadian exchange rate would be associated with only a 0.65 per cent improvement in competitiveness (English, *et al., Canada in a Wider Economic Community*, pp. 70-77). But this would involve greater employment losses than those envisaged in Table 4-16.

Table 4-16

Effects of Tariff Removal on Manufacturing[1] Employment, with and without Devaluation, Two Approaches, by Region, 1970

	Atlantic		Quebec		Ontario		Prairies		Pacific		Canada	
	Proportion of manufacturing employment	Proportion of total employment	Proportion of manufacturing employment	Proportion of total employment	Proportion of manufacturing employment	Proportion of total employment	Proportion of manufacturing employment	Proportion of total employment	Proportion of manufacturing employment	Proportion of total employment	Proportion of manufacturing employment	Proportion of total employment
	(Per cent)											
Without devaluation (e=1)												
Shipments approach	−14.0	−2.21	−20.7	−5.54	−18.7	−5.25	−19.4	−2.02	−12.5	−2.18	−18.6	−4.23
Value-added approach	−16.5	−2.61	−23.2	−6.20	−19.3	−5.43	−19.6	−2.04	−13.7	2.38	−20.0	−4.54
With devaluation (e=1, S_X=2, d=0.10)												
Shipments approach	6.9	1.09	−2.7	−0.72	−1.3	−0.36	−1.2	−0.13	11.4	1.99	−0.3	−.06
Compromised value-added approach	−1.3	−0.21	−11.0	−2.93	−8.0	−2.25	−9.2	−0.96	4.7	0.81	−7.7	1.74
With devaluation and indirect effects (e=1, S_X=2, d=0.10)												
Shipments approach	8.8	3.00	−2.7	0.12	−0.7	0.24	−0.0	−0.83	15.0	5.03	0.5	1.00
Compromised value-added approach	0.6	1.71	−10.9	−2.09	−7.4	−1.65	−8.0	−0.00	8.2	3.85	−6.91	−0.68

1 Excluding the impact on distilleries, wineries, breweries, and all tobacco industries because of the excise content of the tariffs and incorporating a special single estimate for items covered by the Auto Pact, reduced by applying an import demand elasticity of −2 to Canada's imports from third countries in 1970.

But Ontario's proportionate losses would always be smaller than those of Quebec. This region's relative position would improve with the inclusion of indirect effects and the adoption of nonstandardized elasticity assumptions. Its position would deteriorate with a generalized increase in current exports, and the anticipated changes in I/O coefficients would undoubtedly reduce the benefits it would receive from increased exports in other regions. This reduction, however, would be less significant for manufacturing employment in Ontario than in Quebec.

In the manufacturing sector of the Prairies, the proportion of jobs lost as a result of tariff removal would be large, as anticipated in Chapter 2. Despite a very small loss offset as a result of exports, devaluation would appear to reduce the proportion of manufacturing employment that would be lost more in this region than it does in Ontario and Quebec. The relative vulnerability of manufacturing employment in the Prairies compared with the situation in Quebec and Ontario becomes most apparent when the value-added approach is adopted or nonstandardized assumptions about elasticities of supply are used. But, even then, the problem is of a different order, with manufacturing representing such a small proportion of the region's total employment.

These regional differences in the effects of tariff removal derived from simple illustrative assumptions about supply elasticities, price changes, and productivity constants suggest the magnitude of the transitional problem. But, despite the net loss of manufacturing jobs anticipated in Quebec, Ontario, and the Prairies, this analysis suggests that overall manufacturing shipments in Canada would increase and that the productivity gap between the two principal manufacturing regions would be reduced. A correct devaluation could induce sufficient job opportunities to provide for full employment in the short run, but this whole exercise has been carried through on the presumption that the new jobs would be filled by those who would be displaced by tariff removal and that productivity per worker in each region would remain unchanged in the process. These, like the fixity of input-output relationships, are dangerous assumptions. As well, insufficient attention has been paid to the wider implications of devaluation on wages, capital flows, debt, and other input costs. Realization of the potential gains of unilateral free trade will depend upon how well the various governments respond to the transitional problems that are bound to arise in the course of the restructuring process.

5 The Regions and Policy Options for Freer Trade

In his study of commercial policy alternatives open to Canada, R. J. Wonnacott concluded that multilateral free trade would be eminently preferable to the unilateral free trade with devaluation option discussed in Chapters 3 and 4.[1] But he also argued that the optimal policy for Canada, should the current round of multilateral trade negotiations fail, would be "to seek an FTA [free trade area] with the U.S. and as large a domain of other countries as possible.... Then to let Canada's own tariffs erode as much as our domestic political situation and pressure from our partners will allow; if feasible, to aim at full UFT [unilateral free trade]."[2]

The different effects of unilateral free trade in the regions of Canada were analysed in Chapter 4 using what many will consider to be a particularly harsh set of assumptions. These assumptions and some of those used by the Economic Council are examined in order to evaluate that option.[3] The analysis is also extended in this chapter to encompass some limited insights into the regional impact of the multilateral and bilateral free trade options.

Unilateral Free Trade

Critics of this study may readily find fault with any or all of the assumptions on which the analysis has been based. They may, for example, question whether it can be assumed that:

(1) shipments supply curves are upward-sloping;

1 R. J. Wonnacott, *Canada's Trade Options*, Economic Council of Canada (Ottawa: Information Canada, 1975), p. XVI.

2 *Ibid.*, p. 79. But he also shows that "an FTA for Canada would be more beneficial than UFT if, and only if, the U.S. is a member" (p. 78).

3 Economic Council of Canada, *Looking Outward: A New Trade Strategy for Canada* (Ottawa: Information Canada, 1975).

(2) producers price up to the tariff or that imports are directly competitive (homogeneous) with domestically manufactured goods, causing prices to fall by the amount of the tariff "markup";

(3) the relevant tariff rates for industry shipments are as high as the ratio of duties to dutiable imports (or effective protective rates for industry value added);

(4) corrected input-output coefficients can be used to determine the indirect effects of incremental changes;

(5) productivity would remain unchanged with the hypothesized policy changes;

(6) differential elasticity assumptions should be applied in a way that favours Ontario's manufacturing industries; and

(7) devaluation would be needed to accompany unilateral removal of the Canadian tariff.

It is customary among those studying the impact of tariff changes to claim that they have chosen the most damaging assumptions in order to illustrate the maximum extent of the potential dislocation. But the assumptions in this list are more damaging than most and may indeed be too harsh.

For instance, there is now something of a groundswell of opinion in the Canadian literature that unilateral tariff removal need not require devaluation of the Canadian dollar.[4] This position, which results from denying the validity of most of the other assumptions, has been enhanced by the stance taken by the Economic Council of Canada in *Looking Outward*.[5]

The ECC Report suggests that unilateral removal of the tariff in 1969 would have caused imports to rise by 8.1 per cent (pp. 166-170). By assumption, increased imports would give rise to an equivalent loss in manufacturing shipments, which the Council's CANDIDE econometric model translates into direct and indirect losses, throughout the Canadian

4 The arguments are reviewed in B. W. Wilkinson and K. Norrie, *Effective Protection and the Return to Capital,* Economic Council of Canada (Ottawa: Information Canada, 1976), pp. 10-13.

5 Economic Council of Canada, *Looking Outward*, cited hereafter as ECC Report. These findings are favourably reviewed as resting on unnecessarily "extreme" assumptions in D. J. Daly and S. Globerman, *Tariff and Science Policies: Applications of a Model of Nationalism,* Ontario Economic Council Research Studies (Toronto: University of Toronto Press, 1976), p. 62.

economy, of 96,260 jobs.[6] This figure for total losses is less than half that derived from the direct employment losses in manufacturing alone (Tables 4-1 and 4-3) under both approaches in Chapter 4. Despite "unreasonably harsh assumptions," the ECC found the rise in Canada's unemployment from 5.13 to 6.16 per cent not large enough to require devaluation. Instead, they settled for an increase in government expenditures of $1.15 billion, sufficient to halve both the job losses and the fall in real domestic product in manufacturing.

Since these conclusions differ so radically from those developed in Chapter 4, attention must be drawn to the fundamental differences in the two sets of assumptions. There are of course plenty of precedents for the assumptions made in the ECC Report.[7] They may even be realistic. But they should not have been described as harsh.

The ECC Report argues that the direct loss of manufacturing shipments can be approximated by the increase in imports resulting from tariff removal, and that this increase in imports can be estimated by combining actual imports, import demand elasticities drawn from recent experience, and the relevant tariff indicator — duties to total imports — by industry group. This analytical framework engenders much smaller effects than are implied by my first three assumptions. The low import demand elasticities[8] are in fact consistent, given domestic demand elasticities, with the shipments supply elasticities used in Chapter 4 (Assumption 1).[9] But, as illustrated there, the quantity effect assumptions are less important than the price effect assumptions (2 and 3). While the Council considered the ratio of duties to total imports as the appropriate tariff indicator, it is simply a weighted average of goods entering subject to duty and goods entering free of duty, and the price effect so derived is small compared with the tariff rates that actually protect domestic producers from foreign competition. The contention in this study is that these latter rates should not be diluted by goods that enter free,[10] that they are probably higher than the ratio of duties to dutiable imports

6 Something in the order of a 2.75 per cent direct loss on manufacturing shipments is ultimately associated with direct and indirect losses of 6 per cent in real domestic product in manufacturing. See ECC Report, pp. 166-170.

7 H. E. English, B. W. Wilkinson, and H. C. Eastman, *Canada in a Wider Economic Community*, Private Planning Association of Canada (Toronto: University of Toronto Press, 1972), pp. 44-70. R. E. Baldwin, "Trade and Employment Effects in the United States of Multilateral Tariff Reductions," *American Economic Review*, LXVI, No. 2 (May 1976), pp. 142-148.

8 The ECC Report does note that past responses to international price changes might not be representative of the effects of a more radical change in commercial policy.

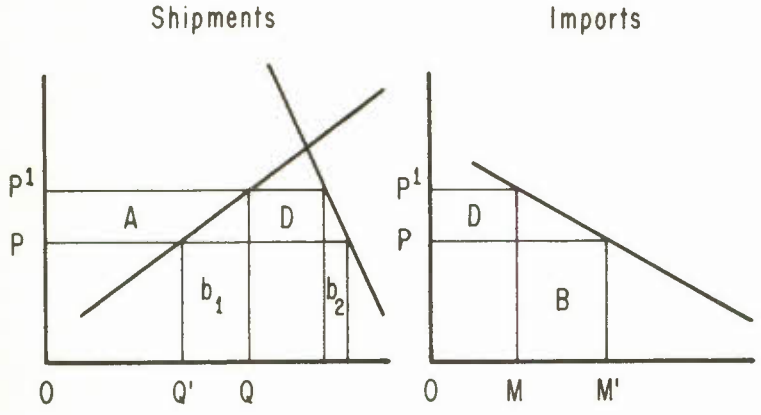
9 $N_m = (1+S/M)N_d + (S/M)e$, where S = shipments and M = imports; N_m = elasticity of import demand; N_d = elasticity of domestic demand; and e = elasticity of shipments supply.

10 It is well known that tariffs escalate according to the degree of fabrication. Exceptions are introduced for special agreements (e.g. the Auto Pact) for specific end-uses and for goods that are of a class or kind not made in Canada.

because of the prohibitiveness of certain tariffs, and that at least some account should be taken of the differences between the tariffs applicable to inputs and those applicable to outputs, as combined in the effective rate of protection.[11] In support of the stance here, it should be noted that, while in 1970 the overall ratio of duties to total imports was 6.5 per cent, and 58.0 per cent of Canada's imports entered free of duty, the ratio of duties to dutiable imports was 15.2 per cent, and one estimate set the average effective rate on manufacturing output at 16.9 per cent.[12]

Chart 5-1

Domestic Demand and Supply, and the Demand for Imports



Another problem with the ECC Report's approach to the estimation of direct losses in shipments is illustrated in Chart 5-1. The increase in the free trade value of imports is represented on the left by area($b_1 + b_2$), which is equivalent to B on the right. As an estimate of the loss of shipments (area A + b_1), the increase in imports is biased downwards by the difference between area A and area b_2. The degree of understatement

11 Since the ECC Report gives considerable coverage to effective tariff rates in Canada and defines them as "the percentage *decline* in value added that may occur if protection is removed" (their emphasis, p. 14), it is curious that effective tariff rates are not included in their simulations of the impact effects of tariff changes. Further discussion of the appropriate tariff rates is found in Appendix B.

12 Wilkinson and Norrie, *Effective Protection*, p. 50. My unwillingness to commit myself wholly to the conclusions of the value-added approach derives in part from the guarded position taken by Wilkinson and Norrie, who say: "We are simply estimating the maximum reduction in value added (or, in due course, the rate of return) individual industries may experience in the event of free trade, barring other adjustments such as rationalization or substitution among productive resources" (p. 14).

increases, the smaller the ratio of imports to domestic shipments. In this study, removal of a 10 per cent tariff is assumed to lead to a 10 per cent fall in the value of domestic shipments, as a price effect. In the ECC Report, area b_2 is used to approximate area A, which, when two- and three-digit industry groups are used, is bound to give figures that are far lower than 10 per cent of domestic shipments.

The direct loss in manufacturing shipments arrived at by the Council's approach, without devaluation, amounts to about 2.75 per cent, while my estimates amount to some 15 per cent. Their estimates seem to be far too small, although some justification for such small effects can be found in the literature. Counter to assumptions 2 and 3, others have argued that imports are imperfectly competitive with domestically produced goods, that domestic producers do not in fact price up to the tariff, and that, as a consequence, tariff removal would not cause domestic prices to fall by anything like the fall in the tariff.[13] While there are good reasons for such assumptions, they are probably less appropriate for Canada than for most other developed countries and where applicable, they reduce the potential benefits, as well as the costs, of tariff removal.

The next step in ECC's analysis was to put the low direct impact losses into the CANDIDE model of the Canadian economy. No attempt was made in Chapter 4 to look for the indirect effects of tariff removal without devaluation, but one can safely assume that one-period shocks to an econometric model, based on recent experience, would not bring about the proportionate losses implied by the coefficients of an inverted input-output table. Presumably changes in manufacturing shipments amounting to 2.75 per cent have occurred in the course of recent cycles and have been accompanied by labour hoarding of a kind that would not follow permanent changes, as envisaged in assumption 4. Certainly the CANDIDE exercise should have been qualified in the light of changes in the sources of interindustry supply that would result from the removal of the tariff.

Nevertheless, a regional breakdown of the impact effects derived on the basis of the ECC Report's assumptions would still show the largest proportionate losses in manufacturing employment occurring, as in Table 4-1, in Quebec, Ontario, and the Prairies. The assumptions in Chapter 4 enlarge these effects substantially. This, when combined with insights from the value-added approach and the necessary incorporation of "corrected" input-output coefficients precludes compromise on the devalua-

13 R. E. Baldwin, "Trade and Employment Effects in the United States of Multilateral Tariff Reductions," pp. 142-145.

tion assumption.[14] We turn now to the broader issue of unilateral free trade versus other policy options from a regional perspective.

Multilateral Free Trade

J. H. Young in his study for the Royal Commission on Canada's Economic Prospects argued that "the severity of the adjustment incurred would be minimised and the size of the economic gains maximised under reciprocal as opposed to a unilateral tariff removal."[15] That the unilateral free trade option, with devaluation, exaggerates the regional adjustment problems is generally acknowledged. In the literature, this is attributed to the relatively low inducements to manufacture exports. Even though the direct impact losses in protected manufacturing for domestic use would be very much higher in the multilateral or bilateral option without a devaluation, increased opportunities for exports would offset these increased losses. The removal of foreign tariffs would stimulate specialization and the further processing of exports and would enable Canada to recapture the foreign tariff revenue now levied on exports.[16]

In order to demonstrate convincingly that the adjustment problems any one region might experience with a unilateral tariff removal and devaluation could be reduced with the multilateral removal of tariffs, it is necessary to show that foreign tariffs deter the potential exports of that one region more than those of the other regions. Undoubtedly Canada's exports of manufactured goods are obstructed by foreign tariffs, but are those of Quebec or Ontario or the Prairies deterred more than those of Canada as a whole?

With the multilateral free trade option, the direct employment effects of tariff removal experienced in manufacturing for domestic use would conform closely with the industrial patterns shown in Tables E-1 to E-7, which are summarized in Tables 4-1 and 4-2. Since the removal of foreign tariffs is expected to increase in manufactured exports, some predictions about which regions and industries might benefit from the resultant job-loss offset must be offered.[17]

14 Objections to assumptions 5 and 6 are not implied in the Council's simulation. The assumption that shipments per worker or wages would remain unchanged with tariff removal should, however, offend most readers. The incorporation of more realistic assumptions would increase the number of job losses. The assumption of differential supply elasticities, suggested by the analysis in Appendix A, has been omitted from the summary Table 4-16 to soften the charge of regional bias.

15 J. H. Young, *Canadian Commercial Policy*, Royal Commission on Canada's Economic Prospects (Ottawa: Queen's Printer, 1957), p. 97.

16 Wonnacott, *Canada's Trade Options*, Figure 3-1, p. 30.

17 Given the increase in manufactured imports, an increase in manufactured exports of around 10 per cent of current manufacturing shipments would probably be necessary to secure a rough balance between the increases in manufactured imports and exports. The direct loss of manufacturing shipments that results from tariff removal would be 15.2 per cent. However more than half of this amount is a price effect (area A in Chart 5-1). The expected increase in imports (areas b_1 and b_2) and the indirect effects on imports might amount to around 10 per cent of current manufacturing shipments.

As a first approximation, one might expect much of the growth of exports to be concentrated, with some additional processing, in those industries that currently export resource-intensive products. Here the analysis of the pattern of export growth associated with devaluation is instructive. It will be remembered that the direct and indirect effects of changing the export supply elasticities for manufacturing industries from $S_x = 1$ to $S_x = 2$ were compared. This corresponded to raising the value of current industry exports from something in excess of an increase of 21 per cent ($S_x = 1$) to something in excess of a 32 per cent increase ($S_x = 2$).[18] This exercise was designed to show the regional impact of increasing existing exports and to permit extrapolation for the effect of yet higher export elasticity assumptions. From this we concluded that increased exports would improve the manufacturing employment situation in the Pacific and the Atlantic regions relative to the rest of Canada; that the manufacturing employment situation in the Prairies would in a relative sense become worse because of its poor showing in both the direct and indirect job-loss offsets; that Ontario would experience a relative loss because of its low share of the direct job-loss offsets; and that Quebec would experience a relative gain only because of the dubious assumption that the indirect effects of Canada's increased exports would remain substantially unaltered by changes in the input-output coefficients.

Since the increases in 1970 exports that were simulated assuming that $S_x = 1$ and $S_x = 2$ represent increases in overall manufacturing shipments of only 4.2 per cent and 6.3 per cent, respectively, larger export elasticities (or larger increases in export prices) would be necessary to maintain a balance with the anticipated 10 per cent increase in manufactured imports.[19] However, the analysis in Chapter 4 implies that uniform increase in Canada's 1970 exports (excluding Auto Pact industries) would do very little to alleviate the relative disruption in the manufacturing sectors of the Prairies and Ontario. The stimulus implied for manufacturing in Quebec is both relatively small and unreliable.

In 1970 some 70 per cent of the manufactured exports of Quebec and the Prairies originated in four two-digit industries: primary metals, food and beverages, paper products, and chemicals. As a second approximation, one might ask whether the removal of foreign tariffs on these items would generate differential export growth rates from the various regions in a way that would favour manufacturing employment in

18 The "excess" referred to here represents the increased value attributed to domestic shipments for domestic use, as a price effect.

19 Postner concluded that even multilateral free trade might necessitate a Canadian devaluation of 3.2 to 4.5 per cent, with the larger figure applicable when no further changes could occur in trade flows covered by the Auto Pact. H. H. Postner and D. Gilfix, *Factor Content of Canadian International Trade: An Input-Output Analysis*, Economic Council of Canada (Ottawa: Information Canada, 1975), p. 107.

Quebec, Ontario, or the Prairies. The regional shares of Canada's exports of these items in 1970 is shown in Table 5-1. Ontario's share might grow because of its proximity to U.S. markets, and faster growth of trade with Europe and Japan than with the United States might change the centre of activity, increasing the shares of the Pacific and Atlantic regions. But, on the face of it, without some national strategy to secure this outcome, there is little reason to believe that the Prairies and Quebec would increase their share of any new exports at the expense of the other regions.

Table 5-1

Regional Share of Selected Manufactured Exports, 1970

	Quebec	Prairies	Ontario	Others
		(Percentage points)		
Primary metals	44.0	4.1	43.1	8.8
Food and beverages	27.0	10.1	34.5	27.7
Paper products	32.8	3.2	22.4	41.6
Chemicals	25.5	10.3	30.6	33.6

This brings us to a third and final approximation of the regional distribution of new exports. Faith runs high in Canadian literature that the prospects for the growth of new manufactured exports are good.[20] It is contended that intraindustry rationalization to obtain economies of scale in secondary manufacturing will ensure markets abroad. It is argued that the miniature replica effects among the foreign subsidiaries that dominate Canada's secondary manufacturing handicap Canada's capacity to export. Thus removal of foreign tariffs would provide a major opportunity for export growth, based upon corporate rationalization and scale economies. However, the evidence on industrial characteristics and regional trade patterns, presented in Chapter 1 and the related appendix, leave the strong impression that rigidities implied by foreign ownership, established linkages, and the interconnection of scale economies and cumulative causation would tend to concentrate both the direct and the indirect job-loss offsets generated by this type of export growth predominantly in Ontario.

At the very least, our analysis of regional trading strengths suggests that Ontario's manufacturing sector, in stark contrast with that of Quebec, would stand to benefit from increased access to opportunities for

20 H. E. English, *Industrial Structure in Canada's International Competitive Position* (Montreal: Private Planning Association of Canada, 1964). The literature is conveniently surveyed in Daly and Globerman, *Tariff and Science Policies*, pp. 21-30.

scale economies equivalent to those available to comparable firms in the United States. The figures in Table 5-2 suggest, for example, that Ontario's foreign exports and interregional exports have a much higher average content characteristic for scale economies (SCAP) than those of Quebec. The scale characteristics for each industry (derived from U.S. data) are positively correlated with industry characteristics for relative U.S.-Canada establishment size, for the degree of concentration, and for the degree of foreign ownership. Ontario's interregional trade balances by industry are positively correlated with the scale characteristic as well as with the three other characteristics (r^O) while Quebec's trade balances by industry are negatively correlated with the scale characteristic as well as with two of the other characteristics (r^Q).

Ontario's manufacturing sector appears to be far more poised to take advantage of the possibilities for increased economies of scale provided by new export markets than does Quebec's. Not only is Ontario's industrial structure tipped towards industries that are characterized by economies of scale, but its establishments are smaller than those in the United States. This greater potential for economies of scale in Ontario contains yet broader prospects for cumulative regional advantage.

Table 5-2

Relative Trading Strengths, Ontario and Quebec, by Selected Industry Characteristic

	Average content characteristic, Ontario/Quebec		Correlation coefficients for trade balances	
	Foreign exports	Regional exports/ regional imports	Ontario	Quebec
	X_F	X_R/M_R	r^O	r^Q
SCAP	2.62	3.10	.259***	-.216**
SCAF	1.68	1.68	.200**	-.138
OWN	1.34	1.22	.179*	.079
SIZE[1]	1.05	1.07	.136	-.090
Characteristics Correlation Matrix				
	A	B	C	D
A SCAP	1.00			
B SCAF	.26***	1.00		
C OWN	.11	.55***	1.00	
D SIZE[1]	.25***	-.12	.05	1.00

1 Reported on a U.S./Canada basis.
* Significantly different from zero at the 5 per cent level.

Source: See Tables 1-5, A-9, and A-10.

Daly and Globerman's recent study presents evidence that existing tariff policies have not only prevented the attainment of scale economies but have thereby reduced rates of innovation and technological diffusion in Canadian manufacturing.[21] Figures on the relative trading strengths of Ontario and Quebec as regards scale economies, research and development, and the technical manpower in Table 5-3 underscore their contention that: "To the extent that trade liberalization would result in increased rates of industrial innovation and diffusion, Ontario has a particularly strong vested interest in such policies."[22] The relationship between scale and new technology, as these authors describe it,[23] is but one component of the cumulative causation model that, as Chapter 1 suggested, could have special relevance for regional employment prospects in Canada in the post-tariff situation.

Table 5-3

Relative Trading Strengths, Ontario and Quebec, Other Selected Industry Characteristics

	Average content characteristic, Ontario/Quebec		Correlation coefficients for trade balances	
	Foreign exports	Regional exports/ regional imports	Ontario	Quebec
	X_F	X_R/M_R	r^O	r^Q
SCAP	2.62	3.10	.259***	-.216**
R&D	1.89	4.45	.264***	-.182*
PROT	1.54	2.27	.200**	.091
UN-EMP	1.09	1.19	.189*	-.045
SIZE[1]	1.05	1.07	.136	-.090

Characteristics Correlation Matrix

	A	B	C	D	E
A SCAP	1.00				
B R&D	.21**	1.00			
C PROT	.03	.53***	1.00		
D UN-EMP	.20**	.51***	.37***	1.00	
E SIZE[1]	.25***	-.06	-.20**	-.11	1.00

1 Reported on a U.S./Canada basis.
* Significantly different from zero at the 5 per cent level.

Source: See Tables 1-5, A-9, and A-10.

21 Daly and Globerman, *Tariff and Science Policies*, p. 83.

22 *Ibid.*, p. 105.

23 "Static scale economies associated with spreading fixed costs of innovation and new technology adoption, both for new capital-embodied production processes and for new products, over large output volumes are ordinarily reinforced by 'dynamic' scale economies associated with learning-by-doing. To the extent that learning economies are a function of accumulated output rates, costs of innovation and new technology adoption would be even more sharply decreasing functions of output." *Ibid.*, pp. 85-86.

This rundown of potential regional exports to be expected from multilateral free trade does not undermine the validity of Young's position. The larger national benefits expected from multilateral free trade, compared with those from unilateral tariff removal, would ease the adjustment process in the Pacific and Atlantic regions as well in Ontario. It would also, of course, alleviate the relative adjustment problem in manufacturing employment in Quebec and the Prairies to the extent that larger national benefits would provide a greater capacity to pay compensation. But multilateral free trade, by itself, would offer far less to the manufacturing sectors of Quebec and the Prairies than to the other regions and would indicate no relative improvement over a policy of unilateral free trade with devaluation.

By contrast, the alternative Canadian policy option of seeking a bilateral arrangement with the United States as a strategic step towards ultimate free trade might appear very attractive to the beleaguered regions — Quebec and the Prairies. Such a two-stage approach to the removal of the tariff would indeed reduce the short-term adjustment problems of these regions from that depicted in Chapter 4. However, such a move would only postpone the necessary adjustments, thereby compounding the difficulties of subsequent adaptation.

Bilateral Free Trade with the United States

In a bilateral arrangement for tariff removal, those industries currently exporting large amounts to the United States might be expected to gain, while industries in which the Canadian tariff is higher than that prevailing in the United States would incur losses. To avoid unnecessary repetition, as we explore the regional impact of this assertion, the following analysis of bilateral free trade abstracts from the potentialities for trade based on economies of scale and makes only passing reference to the increases in Canadian production that might occur because of diversion of U.S. demand from third countries to Canada when Canadian tariffs are lower than U.S. tariffs.

Table 5-4 shows that in 1970 Ontario accounted for the largest share of Canadian exports to the United States, and that some 80 per cent of Ontario's manufactured exports went in this direction. The relative disadvantage of the other regions is far less pronounced in trade with third countries. To the extent that removal of U.S. tariffs would assist domestic adjustment by stimulating further increases in established export items, the bilateral free trade option would be expected to give the most assistance to adjustment in Ontario. The regions with the least amount of their exports going to the United States, and therefore the least assistance, are the Prairies and Quebec.[24]

24 Contrast Table 5-4 with Tables 2-1 and 2-2.

Table 5-4

Regional Shares of Manufactured Exports to the United States and Elsewhere, 1970

	To the U.S.	To the U.S. excluding transportation[1]	To other countries	Total
		(Per cent)		
Atlantic	4.00	6.42	5.43	(100.00)
	(61.47)	(59.90)	(38.53)	
Quebec	21.06	28.95	36.22	
	(55.74)	(46.51)	(44.26)	(100.00)
Ontario	62.26	44.54	32.92	
	(80.39)	(69.37)	(19.61)	(100.00)
Prairies	2.40	3.59	7.55	
	(40.82)	(37.01)	(59.18)	(100.00)
Pacific	10.28	16.50	17.88	
	(55.46)	(54.00)	(44.54)	(100.00)
Canada	100.00	100.00	100.00	
	(68.42)	(59.19)	(31.58)	

1 This column is included because the transportation equipment industry has to a large extent already benefited from tariff-free access to the United States.

In evaluating the bilateral free trade option, the ECC used tariff differences between the two countries — duties to total imports — to derive estimates of the anticipated changes in imports and exports by industry in 1969 and therefore, by assumption, the anticipated changes in shipments.[25] Although taking exception to the tariff indicators used in the ECC Report and to the translation of trade changes into shipments changes, I have, nevertheless, attempted to regionalize the direct effects on manufacturing employment that are implied by their assumptions. The regional effects were derived by distributing the increased imports to regions according to the 1969 regional shipments shares for each industry, and attributing the increased exports to regions according to the 1969 regional shares of Canada's exports to the United States, by industry.

25 The model used is

$$\Delta S_i = E_i^{us}\left(\frac{t_i^{us}}{1+t_i^{us}}\right)\cdot X_i^c - E_i^c\left(\frac{t_i^c}{1+t_i^c}\right)\cdot M_i^c$$

where

S_i = shipments of industry i,
t = tariff levels (duties to total imports),
X = exports,
M = imports,
E = the elasticity of demand for imports,
us = United States, and
c = Canada.

Using the ECC's assumption that the direct impact on an industry's shipments can be represented by the difference between the change in exports and the change in imports, the net change in manufacturing employment would amount to a direct loss of about 1.16 per cent of the Canadian total. Inclusion of the indirect effects, derived from the CANDIDE econometric model, would extend these losses to 1.69 per cent of real domestic product in manufacturing and increase the overall rate of unemployment in 1969 from 5.13 per cent to 5.39 per cent, representing a loss of 24,360 jobs.

The regional and industrial structure of this unemployment rather than the number of direct job losses is of most interest to us here (see Tables 5-5 and 5-6). By a clear margin the largest proportion of job losses appears in Ontario. These are concentrated in electrical products, miscellaneous, textiles, machinery and metal fabricating industries, which accounted for 86.7 per cent of the direct employment losses in Ontario and 85.7 per cent of the losses in Quebec.[26] Those industries also accounted for a much larger share of the manufacturing employment of Ontario (25.3 per cent) than of Quebec (19.7 per cent) or the Prairies (16.8 per cent). Consequently, a bilateral free trade arrangement with the United States would necessitate the largest readjustments in Ontario.

With the exception of textiles and, to a lesser extent, metal fabricating, these were not the industries that the analysis in Chapter 4 showed to be most in need of readjustment in Quebec and the Prairies.[27] The bilateral arrangement with the United States need not force a major reorganization of production in those Quebec industries that benefit from existing tariffs: clothing, food and beverages, tobacco, leather, and the furniture and fixtures industries. In fact, the ECC's findings show that employment in the first two of these industries would be enhanced by the inclusion of partner's trade diversion.

A North American free trade arrangement would, it appears, induce much of the "required" rationalization of industry in Ontario but delay the adjustment in Quebec and the Prairies. Turning a blind eye to the problems of the appropriate methodology and tariff indicators, there is a simple explanation for this finding. The bilateral agreement would remove the protection of those tariffs that were instituted to protect against the threat of U.S. technology or to attract U.S. technology into Canada, as was the case with the old automobile tariff rates. The firms benefiting from this protection have located predominantly in Ontario.

26 A different choice of tariff indicators would change not only the size but also the direction of the changes in employment as in the machinery and miscellaneous industries.

27 Compare Tables 5-5 and 5-6 with Tables E-1 and E-15 to E-19.

Table 5-5

Share of Direct Effects in Manufacturing Employment of Bilateral Free Trade with the United States, by Region, 1969

	Change in employment	Proportion of manufacturing employment
	(Number of jobs)	(Per cent)
Atlantic	233	0.39
Quebec	-4,633	-1.22
Ontario	-8,662	-1.51
Prairies	- 577	-0.70
Pacific	- 129	-0.16
Canada	-13,768	-1.16

Source: Based on data from Economic Council of Canada, *Looking Outward: A New Trade Strategy for Canada* (Ottawa: Information Canada, 1975).

Table 5-6

Share of Direct Losses in Manufacturing Employment under Bilateral Free Trade with the United States, by Principal Industries Affected, Ontario and Quebec, 1969

	Quebec		Ontario	
	Losses	Share of employment	Losses	Share of employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Machinery	434	5.5	1,748	5.1
Miscellaneous	823	5.4	1,718	4.9
Textiles	1,562	4.9	1,137	4.6
Electrical products	766	3.6	2,045	3.8
Metal fabricating	381	1.4	899	1.5
Total	3,970	1.05	7,506	1.31

Source: Based on data from Economic Council of Canada, *Looking Outward: A New Trade Strategy for Canada* (Ottawa: Information Canada, 1975).

Although these tariff rates have been falling since the 1950s, they are still higher than in the United States. In the other industries, Canadian and U.S. tariffs tend to be similar, providing substantial protection against the products of "cheap," "low-skilled," foreign labour.

Conclusion

This chapter began with a description of the relatively large amount of adjustment needed in the industrial structures of Quebec, Ontario, and the Prairies and concludes that neither the unilateral free trade nor the

multilateral free trade option would alleviate the adjustment problems in Quebec and the Prairies. It appears that a bilateral arrangement with the United States, on the other hand, would preclude the necessity of such adjustment in these two regions. It is impossible to predict what sort of reserve clauses affecting the rationalization decisions of foreign subsidiaries would be written into such a bilateral agreement, but the benefits of Canada's increased trade dependence on the United States, and particularly those benefits associated with the scale economies of market swapping, would no doubt go disproportionately to the manufacturing sector of Ontario. However, postponement of the "required" adjustments to the industrial structures of Quebec and the Prairies, while the rationalization process was going on in Ontario, would restrict the attractiveness of these regions as sites for industrial relocation. In the context of cumulative causation, delaying the adjustments in Quebec and the Prairies would involve large opportunity costs, because their subsequent adaptation would be made that much more difficult to achieve. Thus any bilateral free trade arrangement with the United States should incorporate, as Wonnacott argues, a mutual agreement to lower the highest tariffs levied against third-country imports.[28] Failing this, the regional focus of this study suggests that the unilateral free trade option is superior to the bilateral free trade option.

28 Wonnacott, *Canada's Trade Options*, p. 103; see also C. A. Cooper and B. F. Massell, "A New Look at Customs Union Theory," *Economic Journal*, LXXV (December 1965), pp. 742-747.

6 Conclusion: A Regional Perspective on Adjustment to Freer Trade

This study did not seek to prove that Canada's tariffs should be removed. What it has attempted to do is to indicate the regional impact of the tariff on five Canadian regions by simulating the effects of tariff removal. The first few chapters reported the findings of four analyses designed to reveal how the existing tariff system affects regional employment and income patterns. Chapter 2 marshalled the regional manufacturing data for 1970 and provided the framework for the detailed static analysis of Chapters 3 and 4. Chapter 1 and Appendix A provided a historical perspective on changes in regional trading strengths and some superficial indication of the changing nature of the regional effects of the tariff.

The principal analytical effort was devoted to estimating the size of the net interregional tariff transfers from final users in one region to producers in another, and the size and distribution of tariff-dependent employment. The estimation of these regional effects required the detailed derivation of an alternative nontariff situation with which to compare the existing situation. Two hypothetical situations were developed. The first was derived from a simple unilateral tariff removal assumption; the second, incorporated, in addition, an assumed devaluation of 10 per cent.

A comparison of the existing situation with the simple tariff removal alternative, worked through at the three-digit industry level with standardized elasticity assumptions, produced estimates of the net cash costs of the tariff of around 3.5 per cent of personal incomes, with protected producers in central Canada obtaining large net interregional tariff transfers equivalent to 40 per cent of the gross cash costs paid by users in the other regions. This comparison suggested that the manufacturing employment directly dependent upon the tariff, using a value-added approach and effective tariff rates, was around 233,000 jobs, or 20 per cent of Canada's manufacturing employment, with the largest number of tariff-dependent employees working in Ontario, but with the largest proportion of manufacturing employees directly dependent on the tariff living in Quebec (23 per cent) and the Prairies (20 per cent).

Use of the second — and more defensible — hypothetical alternative, which incorporated a devaluation of the Canadian dollar, reduced the net cash costs of the tariff to around 2.2 per cent of personal incomes,

with protected producers in central Canada again receiving some 40 per cent of the lower gross cash cost figures in the form of net interregional transfers. This second alternative standard of comparison implied substantially lower estimates of manufacturing employment directly dependent on the tariff in the two central regions and a reduced deterrent effect of the tariff on the manufacturing employment in the Atlantic and Pacific regions — a function of the devaluation assumption, which reduced import substitution and increased employment in export industries. This second hypothetical standard of comparison, when used with a shipments approach (with $S_x = 2$), led to the conclusion that the direct and indirect effects of the tariff on manufacturing employment in Canada amounted to a net loss of some 5,000 jobs (0.5 per cent), but that the tariff was associated with net gains in Quebec of 10,000 jobs (2.7 per cent), and in Ontario of 4,000 jobs (0.7 per cent). Incorporation of the value-added approach, of course, rendered less optimistic results, setting tariff-dependent employment in Canadian manufacturing at 80,000 (or 6.9 per cent).

For the Atlantic and Pacific regions, the tariff represented a burden on local consumers that was not offset by income receipts of local producers, and manufacturing employment in these regions was substantially reduced by the existence of the tariff. This conclusion held even when the value-added approach was used, but had to be qualified for manufacturing in the Atlantic region when interregional differences in supply elasticities or smaller export supply elasticities were incorporated into the analysis. For the Prairies, the tariff also represented a net burden on consumers, some 40 per cent of which was transferred to producers outside the region. However, tariff-dependent manufacturing employment appeared, according to the value-added approach, to constitute a larger proportion of the manufacturing employment in this region, than in Ontario. Of course, manufacturing employment represents a much smaller proportion of total employment in the Prairies than in Ontario. But with the incorporation of a range of possible interregional differences in supply elasticities, tariff-dependent employment in the manufacturing sector of the Prairies could turn out to be proportionately higher than in Quebec.

Of the two central regions, the analysis showed that Quebec had the largest number of manufacturing employees dependent upon the tariff. In proportion to the manufacturing employment in these two regions, the tariff-dependent component in Ontario ran from a quarter of that of Quebec under the shipments approach to three-quarters of that of Quebec under the value-added approach. In terms of interregional tariff transfers, both were surplus regions, in the sense that their producers receive subsidy-equivalents in excess of the gross cash costs paid by local users. While both regions received approximately the same dollar amounts in net transfer receipts in 1970, these net transfers amounted to a larger share of per capita income in Quebec.

The conclusion that Quebec is the principal beneficiary of the Canadian tariff system, with Ontario a close second, should be viewed in the context of the historical trends outlined in Chapter 1 and Appendix A. The analysis of net transfer position of these two regions revealed that the dependence of Ontario on net tariff transfers has been declining since the Second World War and that manufacturing employment in this region received much higher tariff assistance in the past. What is more, the detailed analysis of the relative trading strengths of these two regions in manufactured goods suggests that Quebec's adaptability to a tariff-free environment might be worse and Ontario's better than was implied by the previous figures.

In the regional impact analysis of Chapter 4, the issue of interregional differences in the adaptability of manufacturing industries was discussed in relation to corporate rationalization decisions and the case for assuming regional or industry-by-industry differences in supply elasticities. The case for introducing regional differences in supply elasticities really arose from the suspicion that elements of cumulative causation and market rigidities might cause industries to rationalize production in ways that favoured Ontario rather than Quebec (or the other regions), despite the availability of labour in the latter region. Geographic location and market potential appear to join hands with any market rigidities associated with high concentration ratios and foreign ownership in tying the strong manufacturing industries more closely to Ontario. Recent growth rates of manufacturing industries in Ontario show some evidence of cumulative effects arising from the economies of scale, the high skill and high research and development characteristics of Ontario's principal industries and their interaction with productivity, lower efficiency wages, and higher investment.[1] Such evidence of the greater adaptability of Ontario's manufacturing base could justify the conclusion that net tariff-dependent employment in that region should be less than revealed in Chapter 4, with corresponding increases in the figures for Quebec and the Prairies.

The estimates of the regional impact of the Canadian tariff derived by comparing the existing situation with the hypothetical case of a unilateral removal of the tariff combined with devaluation were used in Chapter 5 to elucidate the different regional effects of three alternative commercial policy options currently under discussion as a means of achieving the benefits of freer trade. After accounting for the difference in the size of the impact effects shown for a policy of unilateral tariff removal by the Economic Council of Canada and this analysis, the

1 Investment per employed person in Quebec has hovered around 88 per cent of the Canadian average in the 1955-75 period. The much higher average investment per employed person in other regions is reflected in productivity and efficiency wage differentials. Statistics Canada, *The Labour Force*, Cat. no. 71-001, and *Private and Public Investment in Canada*, Cat. no. 61-205.

chapter concluded that, from a regional perspective, a bilateral free trade arrangement with the United States would be preferable to unilateral free trade only if it incorporated a mutual agreement to lower the highest tariffs that each levies against third-country exports.[2] This conclusion arose as much from potential dangers of regional imbalance in the face of aspects of cumulative causation as from strong convictions about the benefits of unrestricted trade.

This study suggests that a devaluation of the Canadian dollar could ensure that tariff removal with or without action by other countries could secure a balance between losses and gains in Canadian employment. Since this position is predicated not only on simplified assumptions of standardized supply elasticities among regions, the rigidity of regional input-output coefficients, and labour productivity, but also on the free mobility of factors between industries and regions, it is important to conclude the analysis of the regional impact of the tariff with some general comments on the problems of adjustment to changes in the tariff. The proviso expressed by Salant and Vaccara in the introduction to their well-known study of the effects of tariff changes on employment, deserves careful consideration:

> Even when changes in commercial policy have the immediate effect of causing unemployment... we may safely retain the traditional conclusion that they need not result in long-run unemployment, provided that policies to overcome the shortcomings of automatic market forces are in fact pursued. Our major departure from the traditional position is that we insist on this proviso.[3]

Adjustment Assistance versus Development Assistance

In addition to the equity grounds that society should share in the costs as well as the benefits of increased efficiency, it is now generally accepted that a case can be made for subsidizing displaced firms or labour to ease the process of adjustment.[4] In a study of freer trade for Canada, Roy Matthews proposed a battery of adjustment programs.[5] His prime concern was to ensure that adjustment assistance and abandonment compensation programs were established to secure quickly the full benefits of tariff removal. The rationalization process he envisaged essentially involved moving plants and workers to the centres of growth,

2 R. J. Wonnacott, *Canada's Trade Options,* Economic Council of Canada (Ottawa: Information Canada, 1975); C. A. Cooper and B. F. Massell, "A New Look at Customs Union Theory," *Economic Journal,* LXXV (December 1965), pp. 742-747.

3 W. S. Salant and B. N. Vaccara, *Import Liberalization and Employment: The Effects of Unilateral Reductions in United States Import Barriers* (Washington, D.C.: Brookings Institution, 1961), p. 8.

4 Wonnacott, *Canada's Trade Options,* p. 23.

5 R. A. Matthews, *Industrial Viability in A Free Trade Economy: A Program of Adjustment Policies for Canada,* The Private Planning Association of Canada (Toronto: University of Toronto Press, 1971).

but he offered no specific proposals for regional adaptation. Matthews acknowledged that the proposed Industrial Redevelopment Corporation would experience political difficulties in closing down plants in areas of high unemployment. But he then sidestepped the fundamental question that still deters political leaders from promoting radical changes in commercial policy:

> The Corporation obviously ought to utilize fully any incentives available under such (regional) programs, but one feels that it should not itself be required to make less than optimum economic arrangements, or to maintain existing imperfections in plant location, except as had been made profitable through regional development policies of federal and provincial governments.[6]

Surely the political difficulties that arise in directing and co-ordinating "regional development policies" oblige economists to become more involved than this in the problems of devising government programs for regional adaptation.

The analysis here suggests that a disproportionate amount of the dislocation resulting from acceptable tariff removal solutions would fall on the manufacturing sectors of Quebec and the Prairies. In the light of the previous discussion of differential regional supply elasticities, adjustment programs simply designed to encourage firms and workers to relocate could be expected to aggravate unemployment in the manufacturing sectors of these most afflicted regions. Such policies would assist the further concentration of Canada's manufacturing sector in Ontario. If the analysis could be extended to the community level, it would reveal particularly trenchant problems in the one- and two-industry communities of these two regions — problems involving the age distribution and sex participation of workers and distance from larger centres.[7]

The following political questions cannot be avoided. Should compensatory aid and adjustment assistance be paid to regions or commutersheds that experience problems? If so, what type of programs are most feasible in a federal, as distinguished from a unitary state? And, finally, can these programs avoid being trade-distorting in nature and therefore simply politically more embarrassing substitutes for tariffs?

6 *Ibid.*, p. 59. It is somewhat unfair to pick on this, since Matthews has since worked extensively on the regional aspects of adjustment policy and is at present undertaking a study of the problem for the Economic Council. However, at the time he was writing his 1971 book there appeared to be a widespread tendency among Canadian economists to overlook the regional issue as it relates to trade liberalization. See, for example, H. E. English, B. W. Wilkinson, and H. C. Eastman, *Canada in a Wider Economic Community* (Toronto: University of Toronto Press, 1972), pp. 126-127.

7 The regional focus of this analysis has been dictated by data considerations. The geographic unit most appropriate for analysis and assistance is most often the commutershed rather than the region.

The first question implies that it might be possible to reject what many now take to be a political necessity.[8] The politics of Confederation, as well as prevailing concepts of equity, demand that adaptation to free trade not involve widespread migration from manufacturing commuter-sheds, particularly those of Quebec and the Prairies. But even on efficiency grounds alone the economic case for local development strategies may often outweigh the economic arguments used to justify programs that involve subsidizing the removal of firms and workers from existing locations.[9]

Adjustment assistance to firms and displaced workers can speed up and facilitate market adjustments to changed conditions by increasing mobility and hastening closures. But there are "shortcomings" associated with the "automatic market forces" that arise when firms and workers make profitable decisions without due consideration of the interests of others in the community or in ignorance of the alternatives that involve group decision-making. The removal of plants and workers, with or without government assistance, destroys the economic and social base of the community leading to a "vicious cycle of decay," which may have cumulative repercussions on rather large areas of any region.[10] Moving plants and workers necessarily involves psychic and capital losses and a range of negative externalities. In some communities this may be justified, but in others, cumulative setbacks, and particularly those resulting from policy changes, call for a co-ordinated infusion of even more capital and more entrepreneurial skills and diversification away from problem industries.

Automatic market forces may also fail because institutionally generated rigidities discourage the relocation or even the continuation of specific manufacturing activities outside the principal growth centres. This may occur, as Kaldor has shown, where local wages, relative to wages elsewhere, are pressed out of alignment with relative

8 A. D. Scott argues this in terms of the staple theory of growth that "does not depend upon a set of regions, with given populations and different growth rates, successively taking-off by clambering over the people of regions that have failed to grow. Instead, it depends upon a group of factors moving from region to region as export advantage dictates. Just as the recreation of a group of growing children requires first nurseries, then gardens, playgrounds, pools, gymnasia, golf courses and so forth, so a country growing by grasping the opportunities to produce those export staples that promise the highest incomes must migrate from one region to another. Of course there can be more than one staple; there is more than one kind of person; and the migration cannot be apprehended or performed overnight. But these qualifications do not suggest that the abandoned region, any more than the abandoned nursery, should be 'compensated'." "Policy for Declining Regions: A Theoretical Approach," in W. D. Wood and R. S. Thoman (eds.), *Areas of Economic Stress in Canada* (Kingston: Queen's University Press, 1965), p. 90.

9 See C. L. Barber's reply to Scott, *ibid.*, pp. 90-91.

10 The cycle is well annotated in L. B. Krause, "The U.S. Economy and International Trade," a paper presented to the Fifth Pacific Trade and Development Conference, Tokyo (January 1970), mimeographed.

productivity.[11] It is well known that locational rigidities can arise because firms become entrenched in locations where they first got started. But firms may also overlook alternative locations because of ownership patterns and oligopolistic market structures. Market failure is less often recognized in the case of infant locations than it is in the more dubious instances of infant industries.

My own perception is that a regional policy involving the payment of adjustment assistance and compensation to seriously affected geographic areas, as suggested in the U.S. Trade Act of 1974, should accompany radical changes in the tariff, and that these funds should be used in ways that reflect the needs and potentialities of those particular areas. In this sense, the Department of Regional Economic Expansion's existing power to designate special areas for assistance provides an important precedent. Public accountability encourages a type of efficiency in the use of funds that is absent when funds are provided by the tariff structure, but whether justified on the grounds of long-run efficiency, equity, or sheer political expedience, direct involvement by the federal government at the local level invites public criticism, regional rivalry, and international reaction, and politicians, with justification, shy away from this kind of exposure. One reason for this is their need to paper over the zero-sum-game aspects of conflicting regional claims. Granting assistance to a specific firm must conflict with the interests of competitive firms in other regions. Assistance given to one community, which involves enticing a firm from some other region, is bound to have political ramifications. Similarly, the direct transfer of federal funds to firms in accordance with the needs of particular communities is likely to involve distortions of international trade, akin to the influence of tariffs, and so invite retaliation.

For these reasons direct responsibility for area adjustment to free trade should devolve to the level of regional government. Provincial governments in each region should be encouraged to plan the future economic base within their region, with some limited co-ordination at the national level. Provinces should be enabled to co-ordinate closures with new investment and job retraining at the local level. The financing for provincial and regional programs should reflect the unequal incidence of the disruption involved in tariff removal and the cumulative aspects of relative development and backwardness. One way of providing for regional equity, compensating for the unequal effects of tariff removal, would be to tie equalization grants *over a ten-year period* to a formula based upon each region's relative corporate tax base and its relative activity rates.[12] The regions receiving these transfers would then be able to

11 N. Kaldor, "The Truth about the Dynamic Effects," The Price of Europe: 3, *New Statesman,* March 12, 1971, pp. 329-340.

12 R. D. Howland, *Some Regional Aspects of Canadian Economic Development* (Ottawa: Queen's Printer, 1955), p. 142.

subsidize or, through institutions like the Cape Breton Development Corporation, take equity positions in industries that they deem to be essential to the long-run viability of their region's economy.

Twenty years ago, the Gordon Commission expressed confidence in the future growth of secondary manufacturing in Ontario and Quebec and this was reflected in the Commission's projections for the regional distribution of Canada's population in 1975.[13] Unforeseen alterations in federal policies have played a small but significant part in explaining why Quebec, in 1975, had 2.5 percentage points less and Ontario 1.2 percentage point more of the Canadian population than was anticipated. While these figures appear small they, in fact, represent a striking misreading of the speed and direction of change. The burden of the conclusions of this study is that the complete removal of the Canadian tariff during the past two decades would have compounded these changes. Current projections for the next decade imply no further growth in manufacturing employment.[14] In future, therefore, tariff reductions that are combined with traditional forms of adjustment assistance should be co-ordinated with special programs, at the regional level, to sustain the manufacturing employment base of each region. In this regard, the biggest problem for regional policy-makers will be in securing the orderly adaptation of the industrial structures of the principal commutersheds of Quebec and the Prairies.

13 Economic Council of Canada, *The Years to 1980,* Ninth Annual Review (Ottawa: Queen's Printer, 1972), p. 61.

14 A region's relative activity rate $a^R = p^R (1-u^R)/p^C(1-u^C)$,

where

p = the participation rate,
u = the unemployment rate,
R = the region, and
C = Canada.

A region's equalization grant might be made to depend progressively on $1-a^R$ and $1-E^R$, where E^R is an equivalent measure of relative fiscal capacity based on per capita income and corporate profits.

Appendices

A Regional Trends in Industrial Location and Trade Advantage, 1870-1970

An account of the growth and changing industrial structure of the manufacturing base of Ontario and Quebec during the last century provides the framework for a detailed analysis of the underlying determinants of industrial location in Canada. For purposes of discussion here, these last hundred years are divided into two distinct periods: the frontier phase from 1870 until 1910, and the maturity phase from 1926 until 1970. The frontier period encompasses the years of western expansion and settlement as well as the period of most rapid urbanization in central Canada.[1]

After the uncertain interlude of the First World War and the postwar depression, Canada entered a new era of urban-industrial development. However, the pattern of regional specialization and interregional trade laid down in the frontier period was not substantially altered.

Regional Growth and Industrial Structure of Manufacturing

The Frontier Period, 1870-1910

These years witnessed the establishment of the current pattern of regional specialization and interregional trade in the manufacturing sector, whose contribution to Canada's gross national product rose from 19 per cent in 1870 and 1880 to 23 per cent in 1910.[2] Except in war time, this share has varied little since then. The gross value of manufacturing

1 How important the former was to the latter remains an open question. See E. J. Chambers and D. F. Gordon, "Primary Products and Economic Growth: An Empirical Measurement," *Journal of Political Economy* (August 1966), pp. 315-332; G. W. Bertram, "Economic Growth in Canadian Industry, 1870-1915: The Staple Model and the Take-off Hypothesis," *Canadian Journal of Economics and Political Science* (May 1963), pp. 159-184.

2 This sector's contribution was 15 per cent in 1860 and 23.5 per cent in 1890. O. J. Firestone, "Development of Canada's Economy, 1850-1900," in *Trends in the American Economy in the Nineteenth Century*, National Bureau of Economic Research, Studies in Income and Wealth, XXIV, 1960, Table IV, p. 25; and *Canada's Economic Development: 1867-1953*, NBER, Income and Wealth Series VII, 1958, Table 89, p. 281.

output in Canada (in constant 1935-39 dollars) grew at an average of 4.4 per cent per year during the period.[3] This industrialization process, in contrast with the generally expansive nature of other elements of the growth of this period, was highly concentrated in the urban centres of Ontario and, to a lesser extent, Quebec. Since 1870, Ontario's share of value added in Canada's manufacturing sector has consistently hovered around 52 per cent. But the industrial concentration in this region has changed substantially. The western expansion of the frontier largely transferred the Atlantic region's share to the western regions.

Despite its well-known weaknesses, the best indicator of industrial concentration by region is the ratio of the region's share of manufacturing value added to its share of the national population. The manufacturing value added per capita in Canada is set equal to 1.00, and the index of regional concentration in manufacturing is calculated as follows:

$$C_r = \frac{va_r}{VA} \Big/ \frac{p_r}{P} = \frac{va_r}{p_r} \Big/ \frac{VA}{P} ,$$

where

VA = value added in Canada's manufacturing sector,
va_r = value added in the region's manufacturing sector,
P = population in Canada,
p_r = population in the region, and
C_r = the concentration indicator for the region.

Trends in this indicator of industrial concentration can be followed in Table A-1. An index value in excess of 1.00 reveals that the region has a relatively high concentration of manufacturing. It also suggests that the region has a surplus in interregional trade in manufactured goods. The obvious trends underscore the extent to which industrialization was increasingly concentrated in central Canada and particularly in Ontario.[4]

The process of industrialization in central Canada in this period should not simply be attributed to western settlement, the growing domestic market, transportation improvements, and the growth of foreign markets for processed resources. It also represents rapid response of central Canada to the continental spread of new technology. Ontario's experience was not unrelated to the more spectacular industrialization that was occurring in the Great Lakes region of the United States (see Table A-2); nor, as is well recognized, was Canada's rapid transition to industrialization independent of government intervention.

3 Bertram, "Economic Growth," p. 170. The growth from 1870 to 1957 was 4.2 per cent per annum, between 1880 and 1890 it was 4.8 per cent, and between 1900 and 1910 it was 6.0 per cent.

4 British Columbia's above-average industrialization in this era is explained by distance and its stage of development. In the following decades, industrial concentration in this region declined very sharply.

Table A-1

Index of Regional Concentration in Manufacturing,[1] by Region, 1870-1910

						Share of value-added in Canadian manufacturing	
	1870	1880	1890	1900	1910	1870	1910
						(Per cent)	
Atlantic	0.77	0.67	0.71	0.62	0.58	15.0	7.6
Quebec	0.97	1.03	0.98	1.06	1.03	33.3	28.7
Ontario	1.11	1.16	1.18	1.20	1.45	51.7	51.1
Prairies	–	0.43	0.44	0.34	0.34	–	6.4
British Columbia	–	1.09	1.55	1.42	1.14	–	6.2
Canada	1.00	1.00	1.00	1.00	1.00	100.0	100.0

1 Disaggregations are shown in Tables A-12 through A-16.

Source: G. W. Bertram, "Historical Statistics on Growth and Structure of Manufacturing in Canada, 1870-1957," in J. Henripen and A. Asimakopoulos, eds., *Papers,* Canadian Political Science Association, Conference on Statistics 1962-63 (Toronto: University of Toronto Press, 1964).

Table A-2

Index of Regional Concentration in Manufacturing, Selected Regions, Canada and the United States, 1870-1910

	1870	1890	1910
New England	2.82	2.37	2.04
Mid Atlantic	1.76	1.81	1.63
Great Lakes	0.81	1.16	1.31
Ontario	0.78	0.94	1.20
Quebec	0.68	0.78	.85
Atlantic	0.48	0.57	0.47
Canada	0.66	0.80	0.82
Canada plus United States	1.00	1.00	1.00

Note: No attempt was made to correct for exchange rates or differences in census techniques in the two countries.

Sources: A. G. Green, *Regional Aspects of Canada's Economic Growth* (Toronto: University of Toronto Press, 1971), pp. 104-105; H. S. Perloff and Associates, *Regions, Resources and Economic Growth* (Baltimore: Johns Hopkins Press, 1961), pp. 12 and 153.

Table A-3

Manufacturing Share of Local Labour Force, by Region, 1870-1910

	1870	1890	1910
		(Per cent)	
New England	44.05	47.87	49.05
Mid Atlantic	32.13	35.84	39.75
Great Lakes	19.65	25.04	33.19
Ontario	n.a.	19.94	23.28
Quebec	n.a.	18.66	21.72
Atlantic	n.a.	15.03	15.03
Canada	n.a.	18.04	18.04

n.a.: Not available.

Note: No attempt was made to correct for exchange rates or differences in census techniques in the two countries.

Sources: A. G. Green, *Regional Aspects of Canada's Economic Growth* (Toronto: University of Toronto Press, 1971), pp. 104-105; H. S. Perloff and Associates, *Regions, Resources and Economic Growth* (Baltimore: Johns Hopkins Press, 1961), pp. 12 and 153.

The aggregate data in Table A-1 reveal the emerging process of industry localization and regional specialization in manufacturing. Disaggregated indexes of regional concentration for 17 industries are included at the end of this appendix. Table A-4 summarizes trends during the 1870-1915 period.

Table A-4

Trends in Regional Concentration, Selected Industries, by Region, 1870-1915

	1880		1915			Location quotients					
						Ontario		Quebec		Others	
	Rank	Percentage share[1]	Rank	Percentage share[1]	Percentage growth rate 1870-1915	1880	1915	1880	1915	1880	1915
Food and beverages	3	15.0	1	20.3	6.0	1.26	1.58	0.84	0.70	0.73	0.70
Iron and steel	2	15.6	2	13.5	4.5	1.34	1.87	0.84	0.87	0.58	0.32
Wood	1	21.1	3	16.4	3.4	1.11	1.44	0.91	0.91	0.92	0.68
Clothing	6	8.9	4	7.8	5.8	1.18	1.64	1.22	1.28	0.37	0.23
Transportation equipment	5	6.2	5	7.3	5.6	1.08	1.37	0.74	0.98	1.19	0.68
Nonferrous metals	12	1.8	6	6.6	10.9	1.08	1.51	1.11	0.84	0.70	0.66
Leather	4	11.6	7	4.6	1.8	0.75	1.27	1.70	1.70	0.55	0.26
Paper products	15	1.1	8	4.7	10.3	0.92	1.35	1.84	1.52	0.04	0.32
Chemicals	8	2.3	9	4.6	7.5	0.78	0.92	1.47	1.78	0.80	0.50
Textiles	7	5.0	10	4.0	5.5	1.39	1.34	0.98	1.53	0.30	0.32
		88.6		89.8							
All industries		100.0		100.0	5.3	1.16	1.53	1.03	1.04	0.66	0.50

1 The figures are percentage shares of VA_i.

Notes: Growth rates are based on current dollar values and expressed as compound rates. Strictly the location quotient is found by deducting the total shown for each region from the coefficient for each particular industry in that region.

Source: G. W. Bertram, "Historical Statistics on Growth and Structure of Manufacturing Canada," *Canadian Journal of Economics and Political Science* (May 1963).

By 1880 there was already an above-average concentration of the food and beverage, iron and steel, and the clothing and textile industries in Ontario. The massive increase in the concentration of Canada's manufacturing sector in Ontario between 1880 and 1915 was above all due to the rapid growth of the Canadian iron and steel industry in this region. However, there was also a very marked increase in Ontario's share of the rapidly growing nonferrous metals, paper products, food and beverages, and clothing industries.

In 1880, Quebec had a strong hold on two of the largest Canadian industries — leather products and clothing — and was well established in the as yet minor industries: chemicals, nonferrous metals, and paper. Up until 1915, that region retained its hold over industries such as leather and chemicals, which fell in rank because of their slow rate of growth. It was not until after 1890 that the textile industry moved rapidly into Quebec; at the same time, this industry also fell markedly in rank. Quebec lost much of its share of the new growth industries — nonferrous metals and paper — to Ontario, and did not participate in the boom in the food and beverage industry. Industrialism based upon iron, steel, and machinery bypassed the region.[5]

The fundamental thrust of the tariff policies of successive Canadian governments has always been to build up Canada's production of iron and steel (primary iron and steel and industrial machinery), textiles, transportation equipment, electrical products, chemicals, and some elements of the food and beverage industry by guaranteeing privileged access to the rapidly growing domestic market.[6] Table A-4 reveals the extent to which protection of these industries benefited central Canada and especially Ontario.

These particular patterns of industrial specialization in Quebec and Ontario and the concentration of manufacturing in the latter region that occurred between 1880 and 1915 have been described as the natural result of geography, resource location, and technological change in North America.

5 Elsewhere in Canada the concentration of all major industries except paper declined. Above-average concentrations appear only in transportation equipment, food and beverages, wood, and nonferrous metals, the natural results of distance and resource-oriented production.

6 J. H. Young characterized the first five industries as the pillars of Canadian protection in *Canadian Commercial Policy*, Royal Commission on Canada's Economic Prospects (Ottawa: Queen's Printer, 1957), p. 113. The protection of electrical products and chemicals is a more recent phenomenon. Details of industrial tariff rates can be found in my "Canadian Tariff Levels, 1870-1959," unpublished Ph.D. dissertation, Yale University, 1970, and in O. J. McDiarmid, *Commercial Policy in the Canadian Economy* (Cambridge: Harvard University Press, 1946).

> In Canada as well as in the United States, economic activity moved towards the centre of the country. In this new region of industrialism, Southern Ontario was strategically located with respect to water-borne and railway traffic. It was adjacent to the Appalachian coal fields and could command the cheaper routes to the Western hinterland.... To these advantages [in Southern Ontario] was added a decisive factor, the tariff walls.... Thus the Great Lakes subregion of Ontario emerged as the Canadian wedge into the United States and forged ahead in stride with the Pittsburgh-Cleveland subregion of the manufacturing belt.... The importance of tariffs in this development cannot be too much emphasized.... Thus the decadence of Quebec's (early) economic preeminence was not a regional incident. It was a much wider phenomenon which was due to the passage from a regime of mercantilism to a system of industrialism based upon coal, steel and steam.[7]

While Faucher and Lamontagne accord considerable importance to the tariff in accounting for the rate of growth of manufacturing in these regions, they explain the peculiar experience of Quebec by the fact that that region, like New England, had to adapt to a new industrial situation in which the only locational advantage lay in a surplus of labour. Quebec, therefore, experienced a great deal of out-migration and joined "the 'sweating system' industry belt of the continent at a time when Ontario was related to the tool producing and steel industry belt." The fundamental question at issue in this appendix is the extent to which Faucher and Lamontagne's explanation in terms of endowments, distance, and government assistance sufficiently accounts for the observed division of manufacturing industries between the two central regions in both the frontier period and the maturity phase.

The Maturity Phase, 1926-70

In this modern period, the rapidly growing population has migrated towards urban centres in high-income regions, particularly Ontario and the far west. These flows have tended to reduce regional inequalities.[8] Most explanations of the overall economic growth experienced during this period note the rising importance of the domestic market and the declining importance of export staples.[9] The primary sector's contribution

7 A. Faucher and M. Lamontagne, "History of Industrial Development," in J. C. Falardeau (ed.), *Essais sur le Québec Contemporain* (Quebec City: Laval University Press, 1953), p. 26. Later in explaining the growth of shoe factories, textile mills, sawmills and railway rolling-stock milling in Quebec, the authors say: "It is interesting to note that most of these industries were to a large extent artificial in the sense that like those of Ontario, they needed tariff protection." *Ibid.*, p. 27.

8 A. G. Green, *Regional Aspects of Canada's Economic Growth* (Toronto: University of Toronto Press, 1971), pp. 60-67.

9 S. Kuznets, "Quantitative Aspects of the Economic Growth of Nations: X Level and Structure of Foreign Trade: Long Term Trends," *Economic Growth and Cultural Change*, vol. 15, Part II (January 1967), pp. 116 and 136.

to Canadian GNP fell off rapidly, in step with the rising contribution of the tertiary sector, while the share of manufacturing remained unchanged. The tertiary sector's share rose from 30 per cent in 1910 to well over 50 per cent in 1969. This sector is largely urban-oriented.

The aggregate indicators of regional concentration in Canadian manufacturing over a 50-year period (see Table A-5) show practically no decline in Ontario's standing relative to that of the other regions. It is true that differential population growth since the Second World War slightly depressed the indicator for Ontario and offset some decline in that of Quebec,[10] but the convergence in the location quotients for manufacturing (towards 1.00) that is so evident in the continental experience is not observable in the purely Canadian experience (see Table A-6).

It is worth pausing for a moment to clarify the basis for thinking that the manufacturing location quotients of the Canadian regions might have converged, as they did in the United States.[11] A fall in Ontario's manufacturing location quotient

$$\frac{v_a^{Ont.}}{p^{Ont.}} \Big/ \frac{VA}{P}$$

might have occurred if the ratio of manufacturing employment to population in Ontario decreased relative to that in the rest of Canada. This might have happened as the rest of Canada took on the further processing of local raw materials, as market size justified the growth of local manufacturing, or as employment in the tertiary sector of Ontario grew.

Table A-5

Index of Concentration in Manufacturing, by Region, 1915-69

	1915	1926	1939	1949	1959	1969
Atlantic[1]	0.63	0.40	0.43	0.37	0.33	0.36
Quebec	1.04	1.11	1.07	1.07	1.01	1.00
Ontario	1.53	1.52	1.57	1.56	1.51	1.50
Prairies	0.32	0.32	0.31	0.34	0.43	0.40
British Columbia	0.85	1.14	0.97	0.93	0.92	0.85
Canada	1.00	1.00	1.00	1.00	1.00	1.00

1 The Atlantic region includes Newfoundland from 1949.

Sources: See Table A-1. Disaggregations are shown in Tables A-12 through A-16.

10 Ontario's share of population rose from 32.6 per cent in 1949 to 35.2 per cent in 1970, while Quebec's fell.

11 The regional location quotients, disaggregated by industry, are proxies for the missing historical data on interregional and international trade flows. A net export balance is implied when a regional location quotient is greater than one. Convergence over time in the aggregate location quotients for manufacturing would therefore signify a decline in Ontario's net export position in manufactured goods.

Table A-6

Index of Concentration in Manufacturing, Selected Regions, Canada and the United States, 1910-70

	1910	1929/30	1950	1970
New England	2.04	1.68	1.62	1.21
Mid-Atlantic	1.63	1.71	1.63	1.21
Great Lakes	1.31	1.66	1.71	1.44
Ontario	1.20	1.09	1.37	.97
Quebec	.85	.71	.91	.68
Atlantic	.47	.26	.33	.25
Canada	.82	.68	.87	.66
Canada plus United States	1.00	1.00	1.00	1.00

Note: No attempt was made to correct for exchange rates or differences in census techniques in the two countries.

Sources: A. G. Green, *Regional Aspects of Canada's Economic Growth* (Toronto: University of Toronto Press, 1971), pp. 104-105; H. S. Perloff and Associates, *Regions, Resources and Economic Growth* (Baltimore: Johns Hopkins Press, 1961), pp. 12 and 153.

A fall might also have occurred if average productivity in Ontario's manufacturing sector declined relative to that in the rest of Canada as population shifted to Ontario in response to wage differentials or as the interest differentials in favour of investment in Ontario declined.

The disaggregated location quotient indicators of regional concentration for 1926 and 1969 are compared in Table A-7. Some convergence is apparent in Quebec and the other regions, largely because of changes in the localization of the paper, wood, and nonmetallic mineral products industries. But the aggregate concentration of manufacturing in Ontario remained unchanged as the region gained the giant share of the fastest growing, domestically oriented, high-tariff industries, such as automobiles, electrical products, chemicals, and miscellaneous products. These industries grew rapidly as a result of the U.S. subsidiary phenomena and much of the growth is attributable to tariff factories. Only in electrical products and miscellaneous industries has Ontario's dominance been dissipated, and in these instances marginally, and only since the 1950s. Ontario has maintained leadership in the products of the iron and steel era but has passed along to the other regions a large part of her share of other resource-intensive products like food and beverages, wood and paper, and nonmetallic minerals.

Already heavily committed to nineteenth-century industries like textiles and clothing, Quebec acquired a much greater share of these industries from Ontario in the modern period. In addition, the region picked up more of the slow-growing food and beverages and wood products industries, while relinquishing its early hold over rapidly grow-

Table A-7

Trends in the Location of Selected Manufacturing Industries, by Region, 1926-69

	1926		1969		Percentage growth rate 1915-69	Location quotients					
						Ontario		Quebec		Others	
	Rank	Industry share[1]	Rank	Industry share[1]		1926	1969	1926	1969	1926	1969
						(Value added per capita)					
Iron and steel	2	12.3	1	17.0	9.3	1.92	1.96	0.87	0.63	0.30	0.38
Food and beverages	1	17.7	2	14.1	7.8	1.35	1.24	0.80	0.96	0.84	0.80
Transportation equipment	5	7.4	3	11.6	9.9	1.92	2.06	0.79	0.70	0.36	0.21
Paper products	3	9.7	4	8.5	10.2	1.19	1.00	1.68	1.22	0.35	0.86
Chemicals	8	4.6	5	6.9	8.3	1.65	1.69	1.25	1.00	0.26	0.32
Food products	4	8.5	6	6.7	7.4	1.21	0.73	0.68	0.78	1.05	1.37
Electrical products	13	3.0	7	6.3	12.2	2.11	1.87	1.03	0.97	0.02	0.16
Printing and publishing	7	5.8	8	4.9	9.0	1.51	1.47	0.83	0.98	0.67	0.56
Clothing	6	5.4	9	4.1	6.5	1.58	0.77	1.45	2.22	0.18	0.30
Miscellaneous industries	17	1.5	10	3.9	10.9	2.12	1.94	0.85	0.85	0.15	0.22
Textiles	9	6.4	11	3.7	4.8	1.26	1.25	1.79	1.82	0.21	0.13
Nonmetallic minerals	12	3.1	12	3.7	8.9	1.66	1.45	0.90	0.87	0.50	0.69
Nonferrous metals	10	3.6	13	3.5	7.1	1.83	0.99	0.77	1.50	0.45	0.65
		89.0		94.9							
All industries		100.0		100.0	8.7	1.52	1.50	1.11	1.00	0.47	0.51

1 The figures are percentage shares of VA_i.

Notes: Growth rates are based on current dollar values and expressed as compound rates. Strictly the location quotient is found by deducting the total shown for each region from the coefficient for each particular industry in that region.

Sources: Statistics Canada, *Manufacturing Industries of Canada*, Section A1969 (no. 31-203) and a special tabulation for 1926.

ing industries such as chemicals and paper.[12] The only exception to this pattern is the slight increase in Quebec's share of the electrical products industry during the 1960s.[13]

From the analysis of the tariff transfers in Chapter 1, it would appear that the changes in the pattern of industrial specialization that occurred in this period tipped the regional distribution of tariff benefits strongly towards Quebec. Ontario received the bulk of the tariff transfers only between 1910 and 1926.[14] Over the years, Ontario's export trade balance in manufactured goods was consistently large and positive, but the industrial subcomponent balances, particularly in clothing, textiles, and food and beverages, fell off substantially, as did the tariff levels on those new industries that remained concentrated in Ontario. The decline in the importance of tariff transfers towards Ontario is in large degree a result of the reduction in nominal tariffs, though not necessarily in effective protection, that occurred in those new industries that by 1949 had become concentrated in that region (iron and steel, machinery and equipment, electrical products, rubber products, miscellaneous manufactures and transportation equipment).

The Determinants of Regional Comparative Advantage in Manufacturing

The absence of a convergence over time in the aggregate manufacturing location quotients and, more strikingly, the differences observed in the industrial structures of the two central regions raise important questions about the fundamental determinants of industrial location in Canada. Such questions have a direct bearing on the dynamic implications of removing the Canadian tariff, for if Ontario's apparent proclivity to acquire the giant share of the new and most rapidly growing industries and Quebec's apparent tendency to become more heavily committed to traditional, tariff-dependent industries reflect actual underlying tendencies, then tariff removal would lead to a further concentration of manufacturing in Ontario with concomitant strains on confederation.

Can the pattern of industrial specialization and interregional exports of Ontario and Quebec be explained by some simple theory of comparative advantage? Is it sufficient to follow Faucher and Lamontagne and explain regional specialization in terms of traditional theories of factor proportions, distance, resource endowments, government policies, and the state of technology? Or does one have to look to yet more eclectic theories involving the product cycle, the cumulative effects of initial

12 This pattern is borne out by shift share analysis at the three-digit level for the 1960s. One published reference to this experience is R. Tremblay's *Indépendence et Marché Commun Québec-États-Unis* (Montréal: Édition du Jour, 1970), pp. 49-54.

13 In the other regions, share increases occurred in the resource-oriented production of wood, paper, and nonmetallic minerals. These regions also retained above-average shares of ubiquitous industries such as food and beverages and printing and publishing.

14 See Table 1-4.

advantage, or the overriding effects of institutional rigidities, such as corporate controls, capital market failures, government intervention, language, and educational differences?

Dales, for one, has objected to Faucher and Lamontagne's conclusions on the basis of his own detailed analysis of the structure of manufacturing employment in three regions.[15] He concluded that the backwardness of Quebec relative to Ontario was not due to differences in factor supplies or resource endowments but to "other" influences. While acknowledging that economists would generally refer to market size, external economies, and agglomerative factors as the other influences, Dales insisted that this is merely a rephrasing of the question: why is the market larger and why are external economies more in evidence? He considered the answer should be expressed in sociological terms as the result of cultural differences.[16]

My attempt to answer the question of what underlies the differences in the industrial structures of Quebec and Ontario is based upon a two-stage effort to isolate the determinants of the trade flows of these two regions. In the first stage certain generalizations are derived from historical estimates of the manufacturing trade flows between three regions of the country.[17] These initial perceptions are then contrasted with the findings of a more detailed analysis of the actual pattern of interregional trade in 1967.[18]

Faucher and Lamontagne's conclusion that Quebec, from the late nineteenth century on, has been relatively labour-abundant and has accordingly tended to specialize in labour-intensive industry has considerable appeal. Quebec's dominance in the leather industry, and its early attraction of textiles and clothing, appears to bear out the Heckscher-Ohlin theory of trade. However, after closer study, and despite admittedly inappropriately aggregated data, such a clear explanation of the different patterns of specialization in Ontario and Quebec does not appear defensible.

To start with, a quick comparison of the aggregate figures for manufacturing in Ontario and Quebec with those for Canada as a whole does not bear out the labour-intensity hypothesis, at least for the years 1926 to 1949. This led to the idea that a cross-classification between relative labour intensity and relative skill intensity is more relevant. Chart A-1 shows the results for five different years. The ratio of wages and salaries to value added is used as an indicator of labour intensity, and the ratio of wages and salaries per employee as the indicator of skill

15 J. H. Dales, "A Comparison of Manufacturing Industry in Quebec and Ontario, 1952," in M. Wade (ed.), *Canadian Dualism* (Toronto: University of Toronto Press, 1960), pp. 203-221.

16 *Ibid.*, p. 220.

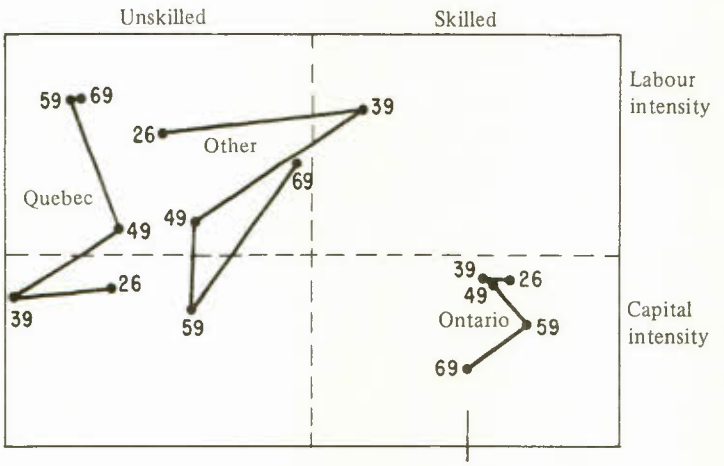
17 The estimated trade flows are based on the regional location quotients.

18 The data for this analysis were drawn from Statistics Canada, *The Destination of the Shipments of Manufacturers, 1967.*

intensity.[19] From the chart, it appears that industries in Quebec were not, in the aggregate, more labour-intensive than those in Ontario, although they may have become so during the last 25 years. However, there was a consistent skill-intensity difference between these regions, in that Ontario possessed more high-wage, high-productivity industries.

Chart A-1

Index of Skill and Labour Intensity[1]
in Total Manufacturing, by Region, 1926-69



1 Regional skill intensity is defined as the wages and salaries employee relative to that in Canada; labour intensity is wages and salaries as a share of value added in each region relative to those in the country as a whole.

Using the location quotients for industry for 1890, 1910, 1926, 1949, and 1969, a series of statistical efforts were made to test the proposition that the skill intensity or labour intensity of an industry should explain its predominant location in Quebec or Ontario. None of these tests gave significant results.[20] This may not be surprising in view of the importance of resource-oriented industries and the findings of similar tests applied in

19 For some justification of this procedure see V. R. Fuchs, *Changes in the Location of Manufacturing in the United States Since 1929* (New Haven: Yale University Press, 1962), pp. 164-174; and B. W. Wilkinson, *Canada's International Trade: An Analysis of Recent Trends and Patterns*, Canadian Trade Committee and Private Planning Association of Canada (Montreal, 1968), pp. 89-107. Regional employment figures prior to 1926 are not available or are not considered to be reliable.

20 Rank correlations for our intensity indicators and the regional location quotients generally give the wrong sign, while multiple correlations to explain the ratio of the location quotients (Quebec-Ontario) were not significant.

the United States.[21] On the other hand, tests on U.S. data have confirmed the proposition that changes in such location quotients through time can be explained in terms of factor intensities. Our location quotients for Quebec and Ontario do not support even this diluted version of the Heckscher-Ohlin theory.

The time trends in the intensity indicators derived at the Canada level of the leading industries producing for the domestic market (see Charts A-2 and A-3) when combined with the changes in the relevant location quotients, raise the following type of questions. For the simple factor-proportions, factor-intensity model to have explained interregional trade in manufactured goods, should not the clothing and leather industries have moved into Quebec earlier in the frontier period? And should not more of the electrical products industry, rubber, the miscellaneous group, the iron and steel industry, and even some of the transportation equipment industry have moved in the more recent period?[22]

The traditional model may not, after all, be appropriate to a regional context, where there are so few barriers to the mobility of labour and capital. A region that can attract and lose these factors cannot be so simply classified as being labour- or capital-abundant. Relative skill or capital abundance in any region depends to a very large extent upon its past experience with manufacturing.

Does the failure of the labour-intensity, capital-intensity distinction as an explanation of trade and industrial location in the 1926-49 period (see Chart A-1) signify that industrial capital was mobile at that time but that it has become less mobile in more recent times?[23] This would be consistent with the peculiar concerns of the U.S. subsidiaries that have come to dominate the market-oriented industries in the postwar period. They tend to settle in southern Ontario, so that they are in a good position to have intracorporate dealings with their head offices, and they tend to avoid this area's "economic shadow."[24] And the stability over time of the skill-intensity differential between Ontario and Quebec may simply reflect a relative abundance that results from selective migration.

On the other hand, the theory of the product cycle offers an alternative explanation of trade and location based on technological

21 J. R. Moroney and J. M. Walker, "A Regional Test of the Heckscher-Ohlin Hypothesis," *Journal of Political Economy*, LXXIV (1966), pp. 573-586, and T. A. Klaasen, "Regional Comparative Advantage in the United States," *Journal of Regional Science*, XIII, no. 1 (1973), pp. 97-105.

22 The movement of the tobacco industry towards Ontario appears to be consistent with these intensity indicators.

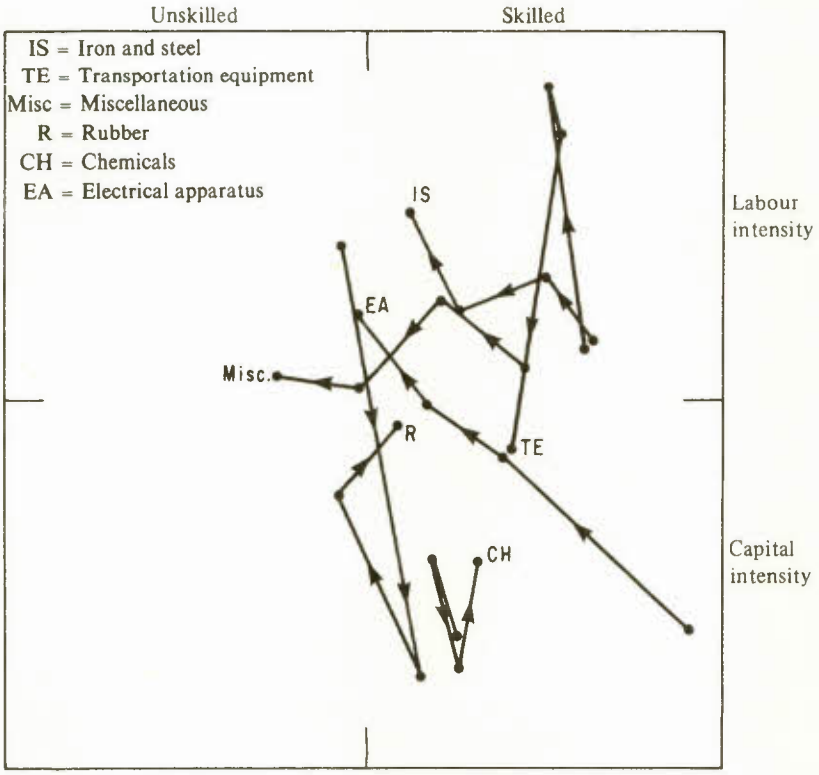
23 Green notes that in the maturity phase labour appears to have been moving towards capital. See *Regional Aspects of Canada's Economic Growth*, p. 113.

24 D. M. Ray, *Market Potential and Economic Shadow*, Department of Geography, Research Series No. 101, University of Chicago, 1965, and "The Spatial Structure of Economic and Cultural Differences: A Factorial Ecology of Canada," *Papers of the Regional Science Association*, vol. XXXIII (1969), pp. 7-23.

gaps.[25] This theory involves the movement of capital in the form of relocating capital-intensive production facilities from the capital-abundant region to regions where cheap unskilled labour is available. This would be consistent with the observed importance of skill differences between Ontario and Quebec as well as the absence of any marked distinction in the capital intensity of production in the two regions. Moreover, such a cycle would appear to be consistent with the relocation of the textile industry in Quebec in the 1890s and it might also apply to parts of the electrical products industry and some elements of the food and beverages industry in the more recent past.

Chart A-2

Index of Skill and Labour Intensity,
Ontario-Based Industries, 1969

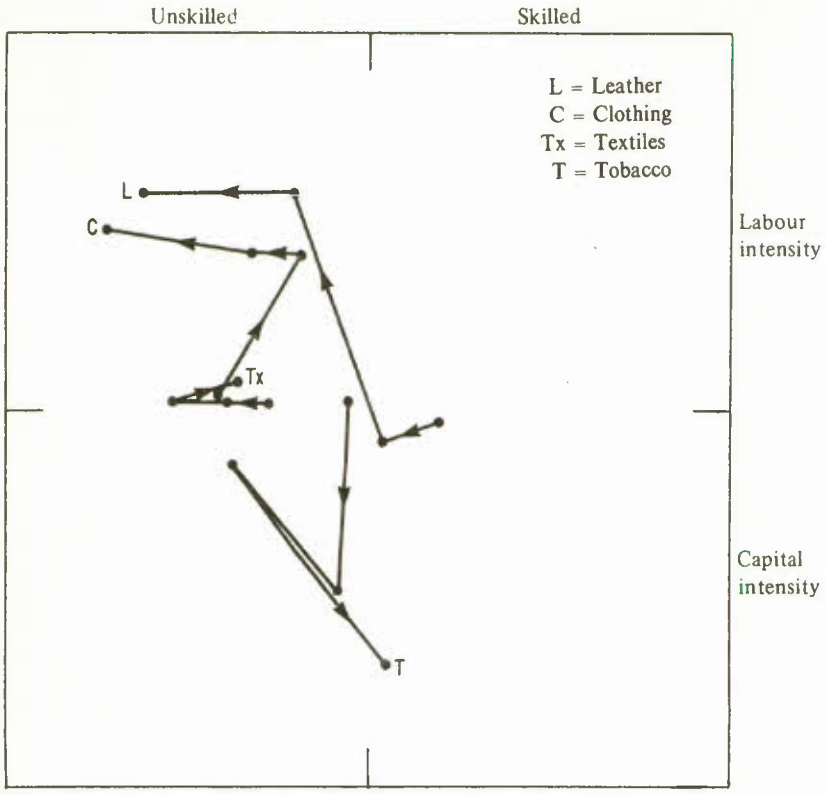


Dots are linked for 1890, 1910, 1926 and 1969.

25 According to the product cycle theory, a product newly introduced into the country requires little physical capital in relation to labour skills; as the product becomes amenable to scale production, these intensities are reversed; and, finally, with standardization and increased competition, the industry tends to relocate with high capital intensity in areas that offer cheap labour supplies. R. Vernon, "International Investment and International Trade in the Product Cycle," *Quarterly Journal of Economics*, LXXX (May 1966), pp. 190-207.

Chart A-3

Index of Skill and Labour Intensity,
Quebec-Based Industries, 1969



Dots are linked for 1890, 1910, 1926 and 1969.

An in-depth study of the determinants of the current pattern of trade of Ontario and Quebec with the rest of Canada cannot provide the answers to these questions, but it can corroborate some of the foregoing generalizations. Tables A-7 to A-9 present the results of a more detailed analysis of the determinants of provincial trade advantage in 1967. Some 27 descriptive characteristics were collected for each of the 130 manufacturing industries, measured at the national level. The objectives were to use each descriptive characteristic separately to develop, for each province's trade bundle, a simple summary statistic referred to as the *average content characteristic*, which would facilitate interprovincial comparisons of trade bundles according to trading strengths; and to observe, for each province, whether there was any significant positive or negative relationship across industries between particular industry characteristic values

and the size of the observed industry trade balances. This exercise can be illustrated with the interregional trade of Ontario and Quebec with all regions, in 1967, using the five descriptive characteristics of industries that most commonly indicate capital intensity, labour intensity, and resource intensity.[26]

Table A-8

Trading Strengths in Manufacturing,
by Industry Characteristic, Ontario and Quebec

	Average content characteristic			
	X_R (1)	M_R (2)	X_R/M_R (3)	r (4)
Ontario				
CRU (D+I)*	.101 (10)	.141 (4)	.72	−.11
EMP (D+I)	.100 (10)	.106 (3)	.94	−.20
CAP (D+I)	.185 (9)	.196 (5)	.94	−.01
DEP/WS	11.2 (9)	12.6 (1)	.89	−.03
CAP/LH	8.9 (6)	8.6 (9)	1.03	−.05
Quebec				
CRU (D+I)	.109 (9)	.148 (3)	.74	−.12
EMP (D+I)	.103 (8)	.105 (5)	.98	+.06
CAP (D+I)	.190 (8)	.197 (4)	.96	−.10
DEP/WS	12.9 (1)	11.7 (4)	1.10	+.01
CAP/LH	8.9 (5)	9.0 (4)	.99	+.12

*The characteristics are as follows:

CRU (D+I): Direct and indirect input-output coefficients for crude materials
EMP (D+I): Direct and indirect input-output coefficients for labour (employment)
CAP (D+I): Direct and indirect input-output coefficients for capital
DEP/WS: The depreciation/wages and salaries ratio
CAP/LH: The capital/labour hours ratio.

26 The trade data were obtained from Statistics Canada, *The Shipments of Manufacturers, 1967*. The industrial characteristic values were obtained from various sources. For those involving input-output coefficients. I am grateful to H. Postner for permission to use his data. H. Postner and D. Gilfix, *The Factor Content of Canadian International Trade: An Input Output Analysis* (Ottawa: Economic Council of Canada, 1976). Other characteristics used in this analysis came from various sources including: H. G. Baumann, "The Pattern of Interregional Trade in Canada," mimeographed, October 1975; G. C. Hufbauer, "The Impact of National Characteristics and Technology on the Commodity Composition of Trade in Manufactured Goods," *TheTechnology Factor in International Trade*, R. Vernon, ed. (New York: National Bureau of Economic Research, 1970); and Department of Industry Trade and Commerce, Office of Economics, Productivity Branch, *Comparative Tables of Principal Statistics and Ratios for Selected Manufacturing Industries: Canada and the United States, 1967, 1963 and 1958* (Ottawa, April 1971).

The figures derived by applying these industrial characteristics to the trade patterns of Ontario and Quebec are displayed in Table A-8. Column 1 shows the average content characteristic of each province's interregional exports in 1967 ($ACC\text{-}X_R$) and column 2 the same for interregional imports ($ACC\text{-}M_R$). The weights applied to the descriptive characteristic value for each industry represent the share of the appropriate trade bundle (either X_R or M_R) attributed to that particular industry. When summed over the 130 manufacturing industries, this gave a simple trade weighted average characteristic value, which we call the average content characteristic. The figures in parentheses next to columns 1 and 2 show the provincial rank for that particular characteristic.

Column 3 shows the ratio of the average content characteristic found for the province's exports to that found for its imports ($ACC\text{-}X_R/ACC\text{-}M_R$), assuming, as it were, a million dollar bundle of provincial exports and imports. This relative figure provides a simple indicator of a province's trading strength in relation to that particular characteristic in the rest of Canada. It is a superficial indicator in the sense that the volume of a province's actual exports and imports are, in fact, different.

The fourth column provides a more telling insight into the importance of a particular characteristic in determining a province's net export position in interregional trade. This column shows the simple correlation coefficient that was obtained by correlating the two series, the industry characteristic and the provincial net export balance in that industry, over the full 130 industries. The province's trade balance for a given industry ($X_i\text{-}M_i$) was normalized by expressing it as a ratio to the province's total trade for that industry (X_i+M_i).

What conclusions do we draw from the figures in Table A-8? The characteristics most commonly used in testing the Heckscher-Ohlin model of trade fail to differentiate between the trade of these two regions. The average content characteristics suggest that both regions have similar patterns of trade. In both provinces, the imported bundle of goods relies on more inputs of crude materials than their export bundles. In both, the imported bundle of goods also uses more inputs of capital and labour. The two capital-intensity characteristics give conflicting results: DEP/WS reveals Quebec as a net exporter of capital-intensive goods and Ontario as a net importer, while CAP/LH shows Ontario as a net exporter of capital-intensive goods and Quebec as a net importer. The signs of the correlation coefficients between industry trade balances and the industrial characteristics values are interesting, but their values are significantly different from zero only in one instance: the size of the industrial trade balances in Ontario are negatively related to the size of the labour-intensity characteristic. While this finding does differentiate between Ontario's industrial structure and that of Quebec, it does not lend much support to the view that Quebec is the purveyor of labour-intensive goods.

The justification for using descriptive industrial characteristics derived at the national level stems from the assumptions of the Heckscher-Ohlin model in which production functions do not differ between

regions. As we turn to a more extensive list of descriptive characteristics, again derived at the national level, we need to point out that the only justification is availability of data; the use of characteristic values specific to each region's industries would have been preferable, were they available. A glossary list of industrial characteristics is shown below. Column 1 in Table A-9 is equivalent to the ratio of Ontario's ACC relative (*X/M* in Table A-8) to Quebec's (*X/M* in Table A-8), and columns 2 and 3 show the trade balance correlation coefficients for Ontario and then Quebec. Since so many of the additional characteristics are highly correlated with each other, Table A-10 shows a simple correlation matrix for the descriptive characteristics themselves.

Table A-9

Characteristics of Regional Trade Advantage
In Manufacturing, Ontario and Quebec, 1967

		ACC relatives Ontario/Quebec[1] (1)	Industry trade balance correlations r_O (2)	r_Q (3)
1	R&D	4.45	+.264[a]	−.182[c]
2	SCAP	3.10	+.259[a]	−.216[b]
3	PROT	2.27	+.200[b]	−.091
4	SCAF	1.68	+.200[b]	−.138
5	AGFFM	1.55	−.035	−.253[b]
6	CRU (D)	1.37	−.086	−.160[c]
7	MCS	1.23	+.221[b]	−.154
8	OWN	1.22	+.179[c]	+.079
9	UN-EMP	1.19	+.189[c]	−.045
10	WAGE	1.16	+.202[b]	−.125
11	GROWTH	1.15	+.142	−.072
12	COAL	1.10	+.120	−.002
13	SIZE[2]	1.07	+.136	−.090
14	PRODTY	1.06	+.211[b]	−.061
15	CAP (D+I)	.98	−.012	−.098
16	CRU (D+I)	.97	−.109	−.117
17	EMP (D+I)	.96	−.201[b]	+.063
18	REW[2]	.94	−.188[c]	+.216[b]
19	CRAF	.90	−.091	+.130
20	TAR I	.86	−.093	+.204[b]
21	EL-EMP	.80	−.267[a]	+.043
22	EP	.79	+.023	+.020
23	LAB	.74	−.263[a]	+.129
24	P&G	.74	−.130	+.163[c]
25	TAR II	.69	−.075	+.211[b]
26	FFM	.61	−.221[b]	−.020
27	EN	.37	−.123	+.171[c]

Correlation coefficient significantly different from zero:

a at the 1 per cent level;
b at the 2 per cent level;
c at the 5 per cent level.

1 Column 1 is the ratio of Ontario's *ACC* relative (*x/m* in Table A-7) to the equivalent figure for Quebec.
2 Note that this characteristic should be interpreted with care. It involves a U.S./Canada comparison, with the Canadian data in the denominator.

Table A-10

Characteristics Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12
1	R&D	1.00											
2	SCAP	.21	1.00										
3	PROT	.53	.03	1.00									
4	SCAF	.26	.27	.25	1.00								
5	AGFFM	−.21	.10	−.20	0.02	1.00							
6	CRU (D)	−.23	.04	−.01	−.00	.90	1.00						
7	MCS	.25	.35	.32	.11	−.11	−.09	1.00					
8	OWN	.39	.11	.45	.55	−.17	−.07	.27	1.00				
9	UN-EMP	.51	.20	.37	−.13	−.31	−.37	.50	.10	1.00			
10	WAGE	.08	−.06	.45	.26	−.03	.07	.06	.15	.02	1.00		
11	GROWTH	−.02	.07	.01	.16	−.12	−.19	.03	.04	−.05	.07	1.00	
12	COAL	−.09	−.21	.12	.10	−.11	−.07	−.21	.07	−.19	.40	.02	1.00
13	SIZE[1]	−.06	.25	−.20	−.12	−.11	−.13	.09	−.05	.09	−.35	−.04	−.18
14	PRODTY	.05	.25	.32	.39	.07	.12	.44	.23	.16	.48	.03	.08
15	CAP (D+I)	−.29	−.03	−.01	−.07	.55	.60	−.18	−.15	−.33	.27	−.22	.39
16	CRU (D+I)	−.25	.06	−.09	−.00	.81	.82	−.14	−.15	.47	.02	−.13	−.15
17	EMP (D+I)	−.38	.06	−.38	−.25	.28	.21	−.12	−.31	.11	−.58	−.17	−.36
18	REW[1]	.05	−.06	.09	.05	−.09	−.10	.01	.10	.01	.14	−.01	.02
19	CRAF	−.08	−.22	−.38	.03	−.18	−.24	−.58	−.04	−.31	−.26	.06	.02
20	TAR I	.03	.14	−.17	.11	−.31	−.37	.12	−.09	.11	−.24	.06	−.24
21	EL-EMP	−.27	.00	−.54	−.20	.47	.34	−.33	−.37	−.18	−.57	−.14	−.25
22	EP	−.12	−.13	.05	−.13	.05	.07	−.21	.00	−.08	.30	−.10	.43
23	LAB	−.38	−.20	−.23	−.21	.34	.38	−.43	−.31	−.35	.13	−.12	.25
24	P&G	−.09	−.10	.39	.02	−.00	.42	.05	.20	−.17	.21	−.19	−.04
25	TAR II	.10	−.07	−.16	−.25	−.31	−.32	.01	−.02	.06	−.53	−.06	−.24
26	FFM	−.15	−.12	−.12	−.13	.42	.38	−.33	−.21	−.11	.09	−.03	.07
27	EN	−.08	−.12	.40	.04	−.05	.38	.04	.21	−.18	.22	−.19	.07

1 Note that this characteristic should be interpreted with care. It involves a U.S./Canada comparison, with the Canadian data in the denominator.

Source: See Glossary Notes.

13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1.00														
−.13	1.00													
−.08	.19	1.00												
−.13	.06	.41	1.00											
.20	−.41	−.18	.44	1.00										
−.14	.23	−.08	−.12	−.18	1.00									
−.01	−.48	−.32	−.18	.19	.02	1.00								
.17	.14	−.35	−.41	.04	.05	.28	1.00							
.13	−.41	.02	.55	.91	−.17	.26	−.01	1.00						
−.17	.08	.46	−.00	−.29	−.02	.06	−.16	−.18	1.00					
−.11	.03	.53	.36	−.06	−.01	−.20	−.34	.14	.24	1.00				
−.07	.13	.21	.22	−.08	−.03	−.20	−.20	−.19	.01	.15	1.00			
.23	−.43	−.43	−.32	.34	−.12	.39	.34	.23	−.18	−.34	−.08	1.00		
−.20	−.14	.23	.37	.08	−.11	.02	−.19	.23	.33	.45	−.02	−.22	1.00	
−.07	.13	.21	.17	−.10	−.02	−.17	−.19	−.22	.05	.16	.98	−.07	−.02	1.00

Glossary of Descriptive Characteristics for Three-Digit Industries, Canada

R&D	Expenditure on research and development per hundred dollars of sales.
SCAP	Scale elasticity parameter from U.S. data.
PROT	Share of professional and technical workers in an industry's work force.
SCAF	Four from concentration ratio for industry shipments.
AGFFM	I/O coefficients for direct inputs from agriculture, forestry, fishing, and mining.
CRU(D)	I/O coefficients for direct crude inputs including AG, FFM and EN.
MCS	Share of managerial, clerical and sales workers in an industry's work force.
OWN	Foreign ownership share based on taxable income.
UN-EMP	I/O coefficients for university educated labour.
WAGE	Wage per hour, manufacturing activity basis.
GROWTH	Fitted growth of value added 1961-71.
COAL	I/O coefficients for input, direct and indirect, of coal.
SIZE	Shipments per establishment US/Canada.
PRODTY	Average value added per unit of total factor input.
CAP (D+I)	I/O coefficients for gross capital stock.
CRU (D+I)	I/O coefficients for direct and indirect use of crude materials (cf. item 6).
EMP (D+I)	I/O coefficients for employment. This includes EL-EMP, UN-EMP and HS-EMP.
REW	Relative efficiency wage US/Canada. The efficiency wage is the wage bill divided by value added.
CRAF	Share of craftsmen and operatives in the industry's work force.
TAR I	Duties to dutiable imports tariff rate.
EL-EMP	I/O coefficients for use of labour with only an elementary education.
EP	I/O coefficients for the direct input of electric power.
LAB	Share of unskilled labourers in the industry's work force.
P&G	I/O coefficients for the input, direct and indirect, of petroleum and natural gas.
TAR II	Duties to total imports tariff rate.
FFM	I/O coefficients for direct inputs from forestry, fishing and mining.
EN	I/O coefficients for direct inputs from coal, oil and natural gas.

The additional characteristics used in Table A-9 differentiate more sharply between the manufacturing trade patterns of Ontario and Quebec in 1967. The ACC relatives in column 1 reveal some major distinctions in provincial trading strengths and some of the additional characteristics are significantly correlated with the size of the provincial trade balances. Briefly, the ACC data show that, in contrast with Quebec, Ontario tends to specialize in the products of industries that are characterized by large expenditures on research and development (R&D), economies of scale (SCAP), a high degree of concentration (SCAF), a high level of foreign ownership (OWN), and that use a lot of professional and technical labour (PROT), university-educated labour (UN-EMP), managerial, clerical and sales personnel (MCS). At the same time, in contrast with Quebec, Ontario tends to be an importer of products from industries protected by high tariffs (TAR I and II), use a large amount of electric power (EP) and energy other than coal (EN and P&G), and products from industries that employ a lot of unskilled labour (LAB, EL-EMP).

The actual size of the trade balances by industry in these two provinces depends significantly on several of these characteristics. At least the signs of the correlation coefficients for all of these characteristics (except OWN and EP) are different for the two provinces. Trade balances by industry are significantly correlated for both provinces with different signs for R&D, SCAP, and SCAF, and for one province in PROT, UN-EMP, MCS, OWN, EL-EMP and LAB, TAR I and II, EN and P&G.

We have already intimated that capital characteristics do not differentiate between the trade of these two provinces. In terms of resource inputs, it is interesting to observe that, relative to Quebec, Ontario tends to export products from industries requiring more inputs from agriculture and coal mines and to import products from industries drawing large inputs from forestry, fishing, and mining. Ontario is also a net importer of products from industries that need a large input of electric power, but this characteristic is not significantly correlated with the size of the industry trade balances of either province. In addition, Ontario specializes in, and its trade balances by industry are positively associated with, industries characterized by relatively high wages (WAGE), high productivity of both labour and capital (PRODTY), and growth in the 1961-71 period (GROWTH). Table A-10 underscores that wage, productivity and growth are positively associated with PROT, SCAP, SCAF, UN-EMP, OWN and MCS, and negatively associated with EL-EMP, TAR I and II.

Two characteristics — establishment size and the relative efficiency wage — involve direct comparisons between U.S. and Canadian industrial data. Notice that the Canadian data are in the denominator. Ontario tends to export products from industries where the establishment size in Canada is small relative to its counterpart in the United States (SIZE), while Quebec exports products from industries that compare somewhat more favourably in establishment size with those of the United States. This is particularly interesting since Table A-10 shows that the relative U.S. establishment size characteristic is significantly correlated with the scale indicator (SCAP). Ontario, it appears, is an exporter of products from industries subject to scale economies, but establishment size tends to be larger in the United States than in Canada.

The relative efficiency wage indicator (REW) between the two countries is equally telling. In contrast with Quebec, Ontario specializes in the products of industries in which the U.S. efficiency wage (W/VA) is low relative to the comparable Canadian industry. To state this more clearly, Ontario specializes in industries in which Canadian efficiency wages are high relative to their U.S. equivalents. And in stark contrast with Quebec, Ontario's trade balances by industry tend to increase the higher the relative efficiency wage in the Canadian industry.

Unfortunately, there are at least two interpretations of this phenomenon. The efficiency wage differences between firms might indicate

differences in efficiency or differences in the labour intensity of production. According to the efficiency interpretation of the REW characteristic, products from industries that are less efficient in Canada than in the United States are more important in Ontario's exports than in those of Quebec. And, unlike Quebec's, Ontario's export trade balances by industry improve, the greater the relative inefficiency in the Canadian industry. This finding may be related to our previous discussion of the differences shown by the relative industry size (SIZE) and the scale (SCAP) indicators for the two provinces.

On the other hand, an alternative interpretation of the REW characteristic for Ontario implies that products from those industries that are more labour-intensive in Canada than in the United States are more dominant in the exports of Ontario. The correlation coefficients across industry trade balances would then imply that the size of Quebec's trade balances tends to be negatively associated with these international differences in labour intensity, while those of Ontario are positively associated. This surprising conclusion would not contradict our rather broad perception that Quebec is not the natural inheritor of industries that are labour-intensive.

Our analysis of the relative strength of Ontario in interregional trade in manufactured goods lends some support to the generalizations drawn from the historical data. It will be remembered that there was little distinction between labour or capital intensity in the industrial structures of Ontario and Quebec. Chart A-1 did suggest some slight increase in the relative labour intensity of Quebec's manufacturing after 1949, which might have reflected a comparatively poor performance of this region in attracting capital. The weakness of this distinction between the industrial structures of these two regions and the stability over time of a substantial skill differential seemed to us to support a model of trade based upon skill endowment differences, but might also be consistent with a product cycle theory.

The more detailed analysis of the current trading patterns of Ontario and Quebec substantiates the absence of any fundamental distinctions between the industrial structures of the two regions with regard to capital intensity and even resource intensity. The small labour-intensity distinction shown in Table A-8 is a negative attribute of industries located in Ontario rather than a positive determinant of industrial location in Quebec.

On the other hand, the components of labour usage shown in Table A-9 reinforce the conclusion that skill differentials must be fundamental to any explanation of the different industrial structures in these two regions. Ontario produces and exports products that use more skilled labour (UN-EMP, PROT, MCS), while Quebec's industrial structure is tipped towards industries that rely heavily on unskilled labour (EL-EMP, LAB, CRAF). This undoubtedly reflects something about the relative factor endowments of these two regions and suggests that factor proportions are the cause of the differences in the industrial structures.

It also is worth remembering that if we had had access to industrial characteristic data for each region, we would probably have found that the sectors within each industry established in Ontario use a higher proportion of skilled labour than those established elsewhere and that those sectors of each industry established in Quebec use a higher proportion of unskilled labour than those settled in Ontario. However, there are reasons for believing that the apparent differences in skill endowments are partly spurious and may be as much the result as the cause of the observed differences in industrial structures.

Another potential explanation of location and interregional trade that might be appropriate — the product cycle theory — is also difficult to analyse with only national level industrial characteristic data at our disposal. The product cycle theory hypothesizes that a movement of capital, and the relocation of particular processes within industrial categories, to areas providing cheap, unskilled labour will occur once those processes have become standardized. Before this happens, trade and location will, it is said, be based upon the availability of skilled and technical labour and will involve modern products and a large expenditure on research and development. National principal location for industries that use a lot of skilled labour and whose research and development expenditures are high. In addition, the average content characteristic for modernity of products (FTD) shows Ontario's exports to have the most recent first trade date. On the other hand, industries employing cheap, low-skilled labour tend to be located outside Ontario but not with less capital-intensive techniques. Can we presume from this static picture, based on national level characteristics, that a product cycle has been operating on the location of Canada's manufacturing sector? Or that Ontario tends to export products in the initial stages of product development and that other provinces, such as Quebec, take over once standardization and labour shortages make it more profitable to process the goods there?

The product cycle hypothesis and the observed flow of skilled labour to Ontario and capital to the resource base elsewhere would certainly embellish the basic Faucher and Lamontagne explanation of the structural differences between Ontario and Quebec. The statistics covering the maturity phase of Canadian development might then be expected to reveal a growing share of the output of particular Ontario-based industries shifting into Quebec. The industry location quotients at the two-digit level reveal that such a shift has occurred in nonferrous metal products, wood and paper products, food and beverages, and petroleum and coal products. Doubtless this was for reasons relating to resource availabilities rather than the attraction of local labour supplies. A shift can be observed — the continuation of an earlier trend — in the leather products, textiles, and clothing industries, but it is not as conspicuous in the five "new" growth industries: transportation equipment, iron and steel, chemicals, electrical products, and miscellaneous products. This requires some explanation.

Is the relatively poor showing of the "new" growth industries in Quebec and the immobility of these industries from Ontario to be explained by the overriding importance of proximity to coal? Or does it perhaps reflect an absence of competitive pressures? Could it be that because of differences in corporate structure, ownership, or government assistance programs, the "new" industries have not, like their predecessors, been compelled by competition from imports to take advantage of the lower wages in Quebec? Perhaps these industries have become tied to Ontario by a complex combination of all these factors — the importance of coal, ownership, market structure, and government assistance — and by the inability of any other region to offer equivalent industrial linkages, internal and external economies, and market potential.

The figures in columns 1 and 2 of Table A-9, drawn from the national level characteristics of the manufacturing industries, bear out these statements with regard to market structure (SCAF), the use of coal (COAL), and foreign ownership (OWN) with different degrees of significance. The low average content characteristic exhibited by Ontario's export bundle with regard to the relative efficiency wage (REW) and the negative association between this characteristic and the industrial trade balances of Ontario indicates, according to either interpretation, a peculiar absence of competitive pressures from U.S. imports. The final suggestion that the other regions are less able to offer equivalent opportunities with respect to industrial linkages, internal and external economies, and market potential is less easily tested, but is of crucial importance. For it introduces the possibility that the concentration of the "new" growth industries in Ontario has the earmarks of a cumulative and irreversible polarization process.

While the cumulative advantage of Ontario in the "new" manufacturing industries must remain a hypothesis, it does not appear inconsistent with historical data. To the extent that it can be substantiated, it offers a very bleak picture for Quebec in the event of tariff removal. The initial establishment and early growth of these industries in Ontario was undeniably associated with tariff manipulation and government assistance. These industries with their acquired thresholds of size, linkages, foreign technology, skilled manpower, and market potential, have already proved themselves capable of withstanding substantial reductions in the tariff. In sharp contrast with the industries located in Quebec, Ontario's industrial structure does not appear to be dependent on high tariffs.

Quebec's trade balances by industry, in addition to being positively associated with unskilled labour (LAB, CRAF) and negatively associated with research and development (R&D) and economies of scale (SCAP), are still strongly associated with two characteristics that are highly vulnerable to reversals in federal policy. The fact that Quebec's net exports by industry, as contrasted with those of Ontario, are so strikingly tipped towards industries that rely on inputs of petroleum and natural gas

or high tariff protection suggests a peculiar dependence upon national policy.[27]

One might well speculate that without these supportive federal policies a higher proportion of Canada's manufacturing sector would have been found in Ontario. But what can be said of the future? How much of the industry currently located in Ontario would move into Quebec to replace those firms and industries that would be decimated by tariff removal? Without government directives, the answer of course depends upon corporate decisions but can be expected to reflect the relative advantages of the two regions. In light of past trends and observations of contemporary trading strengths, the prospects for the Quebec economy are not good.

There are two elements to this conclusion. The first derives from Ontario's advantageous location vis-à-vis the Canadian market and its proximity to the industrial heartland of the United States. This region has tended to attract the bulk of U.S. subsidiary investment in market-oriented industry, the most concentrated industries, and those industries that use a lot of managerial, clerical, and sales personnel. The average content characteristics of Ontario's export bundle is sharply differentiated from Quebec's for OWN, MCS, SCAF, and the size of Ontario's trade balances by industry are positively associated with these characteristics. That these are not the type of industries easily attracted to Quebec is clear from the negative correlations between such characteristics and unskilled labour (see Table A-10). Ontario's success relative to Quebec in these nationally derived characteristics would undoubtedly be reinforced if we had regionally derived characteristics for each industry. Ontario tends to attract head offices, foreign subsidiaries, and the bulk of each industry's managerial staff, partly because of "cultural factors," but more obviously because of factors involving distance.

The second element of our conclusion about the poor prospects for Quebec's manufacturing sector following the removal of the tariff relates to the polarization process in Ontario. The concept of cumulative causation in regional development implies that increasing returns — in the broadest sense — accrue to a particular core region engaged in manufacturing.[28] Kaldor has provided a theoretical model for this process of polarization relying on Verdoorn's Law and an apparent interregional link between manufacturing wages.[29] He contends that this explains the

27 Table A-9 shows the following ACC relatives and correlation coefficients (r^2) P&G .74 and +.16; TAR I .86 and +.20; TAR II .69 and +.21.

28 This broader sense of increasing returns involves internal and external economies, dynamic external economies, agglomeration economies and the cumulative advantages accruing from growth itself. Allyn Young, "Increasing Returns and Economic Progress," *Economic Journal* (December 1928). Well-known exponents of the concept are G. Myrdal, F. Perroux and A. O. Hirschman.

29 N. Kaldor, "The Case for Regional Policies," *Scottish Journal of Political Economy* (November 1970), pp. 337-348.

regional concentration of manufacturing far more successfully than theories based upon exogenous differences in endowments or even sociological factors. It is by no means obvious that this theory is applicable to Ontario's experience, but, if it is, tariff removal would surely enhance the concentration of Canada's manufacturing sector in this region.

Kaldor developed his theory using the manufacturing sector level of aggregation for each region. Since institutional factors maintain a link between regional wage levels, and since higher productivity occurs in the region with the fastest growing manufacturing sector, this region's efficiency wage levels tend to be lower, thereby attracting new investment. The most rapidly growing region can therefore offset any disadvantageous effects of higher wage levels by its higher productivity.

Throughout Canadian history, Ontario has had a peculiar ability to secure a large and increasing share of the most rapidly growing industries. In addition, analysis of current interregional trade (Table A-9), using national characteristics for industry growth rates 1961-71 (GROWTH), reveals that Ontario's average content characteristic was higher than that of Quebec and that the size of Ontario's trade balances by industry were positively associated with this growth characteristic. Although these findings are consistent with Kaldor's model, the crucial test should be not the growth rate of industries at the Canada level, but rather the interregional differences in each industry's growth.

Kaldor's Verdoorn Law asserts that, because of increasing returns in manufacturing, the rate of growth of productivity will be greater the higher the rate of growth of production.[30] The law was tested against the manufacturing data of Canada's ten provinces by applying fitted growth rates for labour productivity (L) and production (P) in the manufacturing sectors of nine provinces for the 1961-73 period in a cross-provincial regression of the form used by Kaldor. The results are not unlike those of Kaldor and others, but the fit is poor because of the very low productivity growth in Newfoundland.[31] In view of the other factors bearing on the growth of productivity in manufacturing, the degree of specialization in the small provinces, and the size of the sample, these weak results are still consistent with the relevance of the Verdoorn law to Canada's regional experience in manufacturing.

Do interregional differences in the rate of growth of output, *at the industry level*, result in differential movements in efficiency wages in a

30 See G. Vaciago, "Increasing Returns and Growth in Advanced Economies: A Re-evaluation," *Oxford Economic Papers*, XXVII (1975), pp. 236-238.

31 Our regression ($L = a + bP$) gave the following results: $L = 1.29 + .50P$ ($R^2 = 0.23$). Kaldor's results across countries were $L = 1.035 + 0.484P$ ($R^2 = 0.83$). Our b-coefficient is significant only at the 5 per cent level. Thirlwall also found a Verdoorn coefficient for manufacturing in the United Kingdom of 0.5 (strictly $L = 2.1 + 0.5P$). A. P. Thirlwall, "Regional Economic Disparities and Regional Policy in the Common Market," *The New Mercantilism*, ed. H. G. Johnson (Oxford: Blackwell, 1974), p. 115.

way that tends to make output growth cumulative?[32] Kaldor's model was based upon increasing returns in a region's overall manufacturing sector, but the interaction of relative growth and efficiency wages should be apparent at the industry level. As a simple test of the relevance of the model to Ontario's manufacturing industries, fitted growth rates for 129 industries in Ontario were compared with those of Canada as a whole, for the 1961-71 period. To support Kaldor's model, the difference between the industry growth rates of efficiency wages between Ontario and Canada $e^o - e^c = \Delta e$) should be negatively correlated with the difference between their industrial output growth rates ($g^o - g^c = \Delta g$).

While this correlation is not sufficient to establish that causality runs in the direction indicated in Kaldor's model, the correlation across industries is indeed negative and significant at the 1 per cent level ($r = -0.396$). Since we would not anticipate any linear relationship across industries between the size of Δg and Δe, we summarize the findings using a quadrant classification (see Table A-11). Ontario's growth rate of output is higher (or lower) than Canada's while its efficiency wage growth is lower (or higher) than Canada's in 85 of the 129 industries. The experience of approximately two-thirds of Ontario's industries is not inconsistent with Kaldor's model. And since these industries accounted for 73 per cent of Ontario's manufacturing shipments in 1970, the relationship must hold for Ontario's manufacturing sector as a whole.

Table A-11

Cross-Sectional Analysis of Kaldor's
Cumulative Causation Model, Ontario versus Canada, 1970

Quadrant	Δg	Δe	Number of industries	Percentage share of Ontario's manufacturing
4	+	−	45	38.13
2	−	+	40	34.79
3	−	−	22	14.18
1	+	+	22	12.90

Note: The five largest Ontario industries in each quadrant are as follows:

Quadrant 1: Petroleum refineries, communications equipment, aircraft and parts, synthetic textile mills, and distilleries.

Quadrant 2: Motor vehicle manufactures, slaughtering and meat packing, dairy products, miscellaneous foods, fruit and vegetable canning.

Quadrant 3: Commercial printing, pulp and paper mills, electrical equipment, clothing, and other paper convertors.

Quadrant 4: Motor vehicle parts, machinery and equipment, metal stamping, pressing and coating, and industrial chemicals.

32 The relationship is more formally specified in R. Dixon and A. P. Thirlwall, "A Model of Regional Growth Rate Differences on Kaldorian Lines," *Oxford Economic Papers*, XXVII, No. 2 (July 1975), pp. 201-214.

Since rates of industry output growth may merely reflect inter-regional differences in industry size, and since Ontario's giant industry — motor vehicles manufactures — falls into our Quadrant 2, more detailed analysis of particular industries is needed. Nevertheless, the cumulative growth process suggested by this analysis might go some way towards explaining why the static cost advantages of production in Quebec over Ontario, that were indicated for 1958 by the Wonnacotts, have not been associated with any major relocation of industry out of Ontario. The Wonnacotts noted lower costs of production in Quebec for the following industries:

(1) Over 5 per cent advantage:	rubber and plastics;
(2) Over 2 per cent advantage:	transportation equipment, miscellaneous industries, metal products, leather goods and wood products;
(3) Under 1 per cent advantage:	clothing, textiles, electrical products, paper products, printing.[33]

That the actual pattern of industrialization in Quebec has not tipped more strongly towards the production of rubber, plastics, transportation equipment, metal products, electrical products, and miscellaneous goods can probably be explained by different combinations of the factors outlined in this appendix (particularly OWN, SCAF, SCAP and the cumulative effects of growth itself).

From the analysis of this appendix, we conclude that Faucher and Lamontagne's list of the underlying causes of Ontario and Quebec's different experience with manufacturing — which includes differences in endowments, distance, technology and government intervention — needs to be extended. Even if amended to include Dales's "cultural differences," there is still a need to incorporate some more of the cumulative elements of the rigidities in Ontario's favour that have offset the anticipated tendency towards industrial dispersion implied by the theory of the product cycle. Kaldor's model of cumulative causation may very well be consistent with the Canadian experience. It gives a rationale for the concentration of growth industries in Ontario and it fits with the persistent migration of labour towards Ontario and with the experience of governments anxious to persuade firms to relocate in less prosperous areas.[34]

Would tariff removal set in motion forces to offset these immobilities? The REW characteristic suggests that Quebec would offer certain

33 R. J. Wonnacott and P. Wonnacott, *Free Trade Between the United States and Canada: The Potential Economic Effects* (Cambridge, Massachusetts: Harvard University Press, 1967), Table 25, pp. 152-155.

34 G. Hodge, "Theory and Reality of Industrial Location in the Toronto Region." Report to Ontario Department of Treasury and Economies (August 1970).

advantages for relocation, but in light of the other characteristics, it seems unlikely. It would require a radical change in the direction of Canada's international trade to offset the entrenched advantage of Ontario in Canada's manufacturing sector.

Table A-12

Location Quotients, Atlantic Region, 1870-1969

	1870	1880	1890	1900	1910	1915	1926	1949	1959	1969
Food and beverages	0.31	0.66	0.76	0.76	0.58	0.56	0.59	0.57	0.60	0.81
Tobacco products	0.85	0.16	0.17	0.18	0.08	0.02	0.02	0.01	0.00	–
Rubber	–	–	–	–	1.13	–	–	–	–	–
Leather	0.73	0.58	0.60	0.46	0.36	0.53	0.30	0.11	0.12	0.09
Textiles	0.49	0.36	0.88	0.85	0.79	0.78	0.59	0.23	0.13	0.14
Clothing	0.59	0.36	0.51	0.35	0.23	0.26	0.18	0.11	0.11	0.12
Wood	1.12	0.92	0.96	0.92	0.96	1.05	0.71	0.52	0.41	0.33
Paper and allied products	0.28	0.04	0.22	0.67	0.48	0.32	0.38	0.95	0.88	0.88
Printing and publishing	0.67	0.53	0.55	0.46	0.44	0.45	0.34	0.31	0.29	0.31
Iron and steel	0.68	0.62	0.60	0.57	0.56	0.68	0.45	0.31	0.26	0.17
Transportation equipment	1.69	1.34	0.86	0.71	0.58	1.09	0.32	0.35	0.30	0.27
Nonferrous metal products	0.73	0.56	1.00	0.33	1.28	1.09	0.11	0.05	0.03	0.05
Electrical products	–	–	0.09	0.06	0.02	–	–	–	0.02	0.20
Nonmetallic minerals	0.91	0.73	0.75	0.61	0.40	0.50	0.19	0.27	0.25	0.33
Petroleum and coal products	–	0.02	0.08	–	0.12	0.79	1.29	0.58	0.54	1.05
Chemicals and chemical products	1.08	0.87	0.53	0.48	0.48	0.42	0.22	0.12	0.09	0.11
Miscellaneous manufacturing industries	0.52	0.30	0.22	0.06	0.11	0.22	0.18	0.23	0.10	0.12
Total	0.77	0.67	0.71	0.62	0.58	0.63	0.40	0.37	0.33	0.35

Table A-13

Location Quotients, Quebec, 1870-1969

	1870	1880	1890	1900	1910	1915	1926	1949	1959	1969
Food and beverages	0.80	0.84	0.81	0.79	0.57	0.70	0.80	0.85	0.89	0.96
Tobacco products	1.81	1.59	2.01	2.30	2.24	2.39	3.23	2.98	2.69	1.81
Rubber	2.82	3.17	2.16	1.12	0.60	0.08	0.88	0.63	0.61	0.85
Leather	1.43	1.70	1.64	1.99	1.68	1.70	1.69	1.66	1.64	1.73
Textiles	0.59	0.98	0.97	1.30	1.53	1.53	1.79	1.94	1.80	1.82
Clothing	1.12	1.22	0.98	1.27	1.39	1.28	1.45	1.96	2.08	2.22
Wood	0.89	0.91	0.70	0.72	0.89	0.91	0.68	0.76	0.77	0.78
Paper and allied products	1.59	1.84	2.01	1.82	1.95	1.52	1.68	1.42	1.27	1.22
Printing and publishing	0.95	0.96	0.76	0.87	0.81	0.73	0.83	0.93	0.94	0.98
Iron and steel	0.81	0.84	0.88	0.82	0.74	0.87	0.87	0.71	0.68	0.63
Transportation equipment	0.84	0.74	1.35	1.02	1.17	0.98	0.79	0.73	0.69	0.70
Nonferrous metal products	1.60	1.11	0.70	0.52	0.88	0.84	0.77	1.18	1.04	1.50
Electrical products	–	–	1.10	2.30	1.82	0.76	1.03	0.90	0.93	0.97
Nonmetallic minerals	1.01	0.85	0.99	0.70	0.75	1.36	0.90	0.93	0.95	0.87
Petroleum and coal products	0.13	0.10	–	0.04	0.12	0.11	0.75	0.87	0.96	0.92
Chemicals and chemical products	1.40	1.47	1.36	1.50	1.23	1.80	1.25	1.03	1.08	1.00
Miscellaneous manufacturing industries	1.13	0.86	0.41	0.38	0.59	0.71	0.85	0.91	0.96	0.85
Total	0.97	1.03	0.98	1.06	1.03	1.04	1.11	1.07	1.01	1.00

Table A-14

Location Quotients, Ontario, 1870-1969

	1870	1880	1890	1900	1910	1915	1926	1949	1959	1969
Food and beverages	1.44	1.26	1.18	1.19	1.67	1.58	1.35	1.33	1.31	1.24
Tobacco products	0.77	1.03	0.69	0.53	0.90	0.95	0.31	0.43	0.67	1.38
Rubber	0.07	0.01	0.71	1.59	2.26	2.86	2.25	2.51	2.41	2.04
Leather	0.80	0.75	0.82	0.71	1.31	1.27	1.44	1.44	1.41	1.31
Textiles	1.51	1.39	1.22	1.08	1.10	1.34	1.26	1.21	1.29	1.25
Clothing	1.08	1.18	1.29	1.26	1.60	1.64	1.58	1.07	0.91	0.77
Wood	1.03	1.11	1.22	1.28	1.20	1.44	1.21	0.89	0.79	0.73
Paper and allied products	0.86	0.92	0.76	0.78	1.05	1.35	1.19	1.11	1.01	1.00
Printing and publishing	1.17	1.27	1.35	1.28	1.68	1.52	1.51	1.57	1.54	1.47
Iron and steel	1.27	1.34	1.30	1.52	1.88	1.87	1.92	2.09	2.00	1.96
Transportation equipment	0.83	1.08	0.90	1.11	1.17	1.37	1.92	2.06	1.99	2.06
Nonferrous metal products	0.67	1.08	1.31	1.02	1.03	1.51	1.83	1.76	1.61	0.99
Electrical products	–	–	1.47	0.65	1.37	2.30	2.11	2.21	2.05	1.87
Nonmetallic minerals	1.03	1.23	1.13	1.47	1.40	1.33	1.66	1.68	1.52	1.45
Petroleum and coal products	2.05	2.15	2.25	2.33	2.07	1.65	1.32	1.44	0.87	0.92
Chemicals and chemical products	0.66	0.78	0.97	1.01	1.28	0.92	1.65	1.69	1.65	1.69
Miscellaneous manufacturing industries	1.10	1.49	1.89	2.11	2.22	1.99	2.12	2.00	1.89	1.94
Total	1.11	1.16	1.18	1.20	1.45	1.53	1.52	1.56	1.51	1.50

Table A-15

Location Quotients, Prairies, 1870-1969

	1870	1880	1890	1900	1910	1915	1926	1949	1959	1969
Food and beverages	–	0.46	0.79	0.73	0.60	0.62	0.73	0.85	0.87	0.76
Tobacco products	–	0.02	0.16	0.20	0.13	0.05	0.00	–	–	–
Rubber	–	–	–	–	0.12	–	–	0.00	0.00	0.19
Leather	–	0.27	0.34	0.10	0.10	0.15	0.04	0.10	0.13	0.17
Textiles	–	–	0.11	0.10	0.13	0.13	0.06	0.05	0.10	0.11
Clothing	–	0.34	0.44	0.16	0.08	0.23	0.18	0.32	0.37	0.39
Wood	–	0.73	0.36	0.27	0.26	0.20	0.26	0.41	0.42	0.41
Paper and allied products	–	–	0.13	0.02	0.12	0.19	0.03	0.13	0.21	0.20
Printing and publishing	–	0.67	0.98	1.20	0.56	0.84	0.74	0.61	0.59	0.60
Iron and steel	–	0.36	0.53	0.07	0.16	0.12	0.18	0.21	0.32	0.39
Transportation equipment	–	0.38	0.18	0.78	0.76	0.54	0.36	0.27	0.27	0.13
Nonferrous metal products	–	0.05	0.26	0.12	0.08	0.04	0.05	0.09	0.27	0.34
Electrical products	–	–	–	–	0.04	0.02	0.03	0.06	0.10	0.13
Nonmetallic minerals	–	1.18	0.34	0.48	1.04	0.37	0.54	0.60	0.80	0.87
Petroleum and coal products	–	–	–	0.18	0.11	0.49	0.81	0.53	1.60	1.29
Chemicals and chemical products	–	0.08	0.42	0.15	0.51	0.37	0.19	0.23	0.36	0.40
Miscellaneous manufacturing industries	–	0.12	0.09	–	0.11	0.17	0.07	0.10	0.22	0.19
Total	–	0.43	0.44	0.34	0.34	0.32	0.31	0.34	0.43	0.40

Table A-16

Location Quotients, British Columbia, 1870-1969

	1870	1880	1890	1900	1910	1915	1926	1949	1959	1969
Food and beverages	–	2.68	2.57	2.34	1.24	1.28	1.61	1.18	0.91	0.83
Tobacco products	–	0.54	1.94	0.68	0.38	0.11	0.04	0.00	–	–
Rubber	–	–	1.16	–	–	–	0.06	0.01	0.02	0.03
Leather	–	0.69	0.42	0.18	0.05	0.08	0.15	0.20	0.14	0.10
Textiles	–	–	0.07	0.03	0.03	0.04	0.10	0.11	0.13	0.10
Clothing	–	0.61	0.86	0.48	0.05	0.22	0.16	0.15	0.18	0.20
Wood	–	1.39	2.64	2.25	2.89	1.57	4.24	4.28	4.39	4.20
Paper and allied products	–	–	0.05	–	0.04	0.77	1.42	1.13	1.78	1.81
Printing and publishing	–	0.74	1.12	1.04	0.44	0.88	1.05	0.87	0.80	0.74
Iron and steel	–	0.40	1.19	0.59	0.54	0.25	0.43	0.46	0.43	0.45
Transportation equipment	–	0.61	1.14	1.40	0.88	0.34	0.39	0.33	0.46	0.26
Nonferrous metal products	–	4.65	0.66	10.58	3.87	1.98	2.36	0.77	1.11	1.59
Electrical products	–	–	–	0.33	–	0.01	0.03	0.09	0.16	0.23
Nonmetallic minerals	–	0.48	2.22	1.18	1.02	0.60	0.86	0.49	0.46	0.65
Petroleum and coal products	–	0.48	–	0.42	3.71	3.62	0.59	1.39	1.02	0.98
Chemicals and chemical products	–	1.25	1.72	0.86	0.89	1.11	0.57	1.14	0.60	0.42
Miscellaneous manufacturing industries	–	0.04	0.10	0.28	0.38	1.12	0.33	0.45	0.33	0.28
Total	–	1.09	1.55	1.42	1.14	0.85	1.11	0.93	0.92	0.86

B Estimation of Interregional Tariff Transfers

To develop a series of estimates of interregional tariff transfers, it was necessary to devise a means of quantifying, on an industry basis, domestic disappearance[1] by region the price markup attributable to protection, and interregional trade flows. The objective was to measure the excess cost paid by users in each region as a result of the tariff and to estimate where these excess costs were ultimately redistributed. In doing this, a procedure that would avoid double-counting and yet be sufficiently functional to use available data was sought. The task was greatly complicated by trade in intermediate goods and by the effects of protection on the exchange rate.

Domestic Disappearance

The most appropriate definition of domestic disappearance appears to be the value (price x quantity) of sales to final users. Cutting into the circular flow of goods between individuals as producers and as final users, in this widely recognized manner, has certain obvious conceptual advantages over alternative approaches involving shipments or value added. The sales-to-final-users approach avoids problems of double-counting and gives an obvious meaning to costs in excess of world prices.

Since regional figures for final sales by industry and for final imports and duties by industry cannot be derived in any strictly defensible way from the generally recognized data sources, the gross concept of domestic disappearance is often used. It is derived by adding the total shipments of each industry to the commodity imports (gross of duties) classified for that industry and deducting the commodities exported. This "shipments approach" is usually followed at a level of industrial aggregation that does not permit distinction between imports that are inputs into a production process and imports that are competitive with its output. But, more significantly for any analysis that involves aggregating industries, total shipments emerges as an unreliable concept because it can

1 Domestic disappearance is defined as the value of production, imports, and duties less exports.

involve so much double-counting of intermediate outputs. While these double-counting deficiencies of the shipments approach can be avoided by using value added by industry, and by adding the value of all imports and deducting the value-added content of exports, the "value-added approach" makes the concept of excess cost difficult to conceptualize and even more difficult to compute in a historical context.

But if domestic disappearance is measured by the final sales approach, the subsidy-equivalent of the tariff will be attributed to the industry that finishes the product when, in fact, a large part of it should be redistributed backwards to the industries that supply intermediate inputs into the production process — and to the government for the tax on imported inputs. Thus one should make a distinction between the first-round recipients and the second-round redistribution recipients; the lines of redistribution being obtained from input-output linkages. The shipments approach to domestic disappearance cannot do justice to the problem of intermediate purchases and, while the value-added approach is well suited to handle intermediate transactions involving the subsidy-equivalent of the tariff, its use introduces problems with the price markup and domestic disappearance concepts.

In the estimates of interregional tariff transfers in Chapter 1, domestic disappearance was estimated according to the shipments approach using data for 17 manufacturing industries from the *Historical Statistics of Canada*,[2] and the *Census of Manufacturers*. In the more detailed estimates of contemporary interregional tariff transfers, in Chapter 3, domestic disappearance was estimated using a final-sales approach assuming constant production and consumption relationships and drawing on the 1961 input-output table.[3]

Price Markups Attributable to Protection

As a concept, the price differential between the Canadian protected price and the world price for any industry would be readily understood if it were expressed as a weighted average of the excess cost of finished goods (by industry) produced or consumed in the country. The weighting process should ideally be based upon the share of each finished good in Canadian (or regional) consumption in a free trade situation. The actual post-tariff consumption weights would be far superior to the use of current domestic production weights. But how, in practice, can an index of the margin of protection be prepared?

2 M. C. Urquhart and K.A.H. Buckley (eds.), *Historical Statistics of Canada* (Toronto: Macmillan, 1965), series Q; Statistics Canada, *Census of Manufacturers*, various years. See also H. M. Pinchin, "Canadian Tariff Levels, 1870-1959," unpublished doctoral dissertation (Yale University, 1970).

3 Statistics Canada, *The Input-Output Structure of the Canadian Economy 1961*, Cat. no. 15-501. For further explanation, see Appendix D.

Until recently, the most commonly used indicator of the price markup attributable to protection has been the ratio of duties collected to the total value of imports. Such import-incidence measures have, not inappropriately, been criticized as measuring the tariff by its non-effect, for they weight highest the items that enter the country free of duty or at the very lowest rates. The ratio of duties to total imports is best applied to the grosser concept of domestic output — the shipments approach — to approximate the protection markup on domestic disappearance. Despite the dilution because certain tariff rates are prohibitive, the appropriate indicators for the final-sales approach to domestic disappearance seem to be the ratio of duties to dutiable imports. These indicators more closely approximate the detailed price differences presented in Young's cash cost study[4] than the ratio of duties to total imports. The best current illustration of the innappropriateness of the latter indicator is the ratio for automobiles — around 1 per cent.

The value-added approach to domestic disappearance would necessitate the use of effective tariff rates: the dollar markup on free trade value added permitted by the nominal tariff rate on an industry's net sales (sales, net of sales to itself). Conceptual and historical data problems with this approach become yet more complicated for, through time not only do tariff rates and patterns of consumption and production change, but so do production functions and factor costs.

Whichever approach is used to approximate the tariff markup on domestic disappearance, one has to be aware of the problems that some producers may not price up to the relevant tariffs and that the removal of protection may not cause some domestic prices to fall far because of brand affiliations.

In the estimates of interregional transfers in Chapter 1, the tariff markup for each industry was approximated using the relevant ratio of duties to total imports, with import incidence weights.[5] In the estimates of contemporary interregional tariff transfers in Chapter 3, the tariff markup was compiled using duties to dutiable imports by industry and the final-sales approach. The industry tariff indicators were taken from a special 1970 tabulation by Statistics Canada. Having established the size of the markup or cash cost by this procedure, its ultimate regional distribution was calculated using the 1970 distribution of value added and the Chand and Salley effective rates for each industry.[6]

The price markup attributable to protection involves the assumption that if the tariff were removed, imports would enter at local price less tariff. This assumption is false, since any unilateral tariff removal would

4 J. H. Young, *Canadian Commercial Policy,* Royal Commission on Canada's Economic Prospects (Ottawa: Queen's Printer, 1957).

5 These data were taken from Pinchin, "Canadian Tariff Levels."

6 U. K. Chand and J. B. Salley, "Measurement of Effective Rates of Tariff Protection of Canadian Manufacturing Industries," Department of Finance, Working Paper 7203, 1972.

probably be associated with some devaluation. To correct for the change in the exchange rate it would be necessary to raise the free trade price and also adjust the protection margin for the higher cost of imports. One can readily anticipate that correcting for an expected devaluation would reduce all interregional transfers. In Chapter 1, no correction was made for the free trade devaluation equivalent of the tariff system. Chapter 3 attempts to correct this omission with an illustrative devaluation of 10 per cent.

Interregional Trade Flows

There are two parts to the problem of estimating domestic disappearance at the regional, as distinguished from the national, level that are common to both shipments and value-added approaches as well as to the final-sales approach. The first problem is to attribute the country's foreign exports and imports to particular regions; the second is to specify interregional trade flows in domestically produced goods. When the final-sales approach or the value-added approach is used, these problems become conceptual as well as being subject to data shortages.

In the shipments approach in Chapter 1, exports to foreign countries were apportioned to regions before interregional trade flows were estimated. The method was to attribute Canada's exports to those regions where the regional share of Canada's shipments less exports exceeded the relevant region's share of Canadian income. In food and beverages, wood products, and nonferrous metals, each of the three regions considered appeared to be engaged in exports. In these cases, exports were apportioned to regions solely on the basis of the size of their shipments. As a second step, domestic disappearance at the Canada level was then divided among the regions assuming that imports and domestic shipments for domestic use, by industry, represented the same proportion of income in each region as in the country as a whole. The net interregional trade flows by industry were therefore, in effect, derived by multiplying the Canada level estimate of shipments for domestic use by the difference between the regional shares of Canada's industrial shipments and income, after correction for foreign exports.

In the more detailed final sales approach adopted in Chapter 3, domestic disappearance by industry in each region was estimated using Statistics Canada data on foreign exports by region of lading and interregional shipments. Chapter 3 and Appendix D report on two separate procedures for estimating domestic disappearance by region and interregional flows of finished goods. The first involves constants derived from an input-output table, the second involves constants derived from the shipments approach to regional disappearance.[7]

7 The sources used for these exercises were special tabulations for exports, imports, and duties by Statistics Canada, *The Input-Output Structure of the Canadian Economy, 1961*, Cat. no. 15-501, and *The Destination of Shipments of Manufacturers, 1967*, Cat. no. 31-504.

C Regional Statistics

Table C-1

Share of Manufacturing Shipments, by Industry and Region, 1970

	Atlantic	Quebec	Ontario	Prairies	Pacific
			(Per cent)		
Food and beverages	7.3	27.5	40.4	17.3	7.5
Tobacco products	–	44.5	55.5	–	–
Rubber	–	23.6	72.7	3.4	0.3
Leather	*	47.5	47.5	3.5	0.8
Textiles	1.4	51.9	43.8	1.8	1.1
Knitting mills	3.6	67.6	25.4	2.2	*
Clothing	*	66.4	22.6	8.9	1.9
Wood	5.0	18.0	16.3	7.7	53.0
Furniture and fixtures	0.9	37.5	49.4	7.1	5.1
Paper and allied products	9.4	35.0	33.5	3.7	18.4
Printing and publishing	2.7	28.8	51.8	9.8	6.9
Primary metals	*	29.8	57.4	5.2	5.4
Metal fabricating industries	1.7	23.3	61.0	7.0	7.0
Machinery	0.5	14.9	73.9	6.1	4.6
Transportation equipment	2.4	15.4	77.3	2.5	2.4
Electrical products	1.5	27.9	65.1	2.9	2.6
Nonmetallic minerals	3.4	24.5	52.5	12.5	7.1
Petroleum and coal products	*	28.1	34.0	19.1	10.1
Chemicals and chemical products	2.1	27.8	60.2	5.7	4.2
Miscellaneous manufacturing industries	1.1	23.8	68.9	3.1	*
Total	3.8	28.5	51.8	7.8	8.1

* Data from Statistics Canada with exclusions where necessary under the confidentiality provisions of the Statistics Act.

Table C-2

Share of Manufacturing Employment, by Industry and Region, 1970

	Atlantic	Quebec	Ontario	Prairies	Pacific
			(Per cent)		
Food and beverages	36.75	10.33	9.35	24.11	11.91
Tobacco products	–	1.28	0.46	–	–
Rubber	–	1.24	1.94	0.52	0.12
Leather	*	3.30	1.92	1.00	0.24
Textiles	2.18	8.07	4.23	1.41	0.96
Knitting mills	1.92	3.42	1.11	0.39	*
Clothing	*	15.11	3.67	9.35	2.07
Wood	9.10	4.49	2.45	7.15	36.07
Furniture and fixtures	0.71	3.74	2.85	3.14	1.75
Paper and allied products	14.91	8.99	6.00	3.68	13.15
Printing and publishing	3.18	3.59	4.48	7.20	3.68
Primary metals	*	4.85	10.00	6.39	6.21
Metal fabricating industries	4.16	7.30	10.91	10.21	7.44
Machinery	0.76	2.08	5.88	3.95	2.62
Transportation equipment	9.66	6.08	11.94	6.85	4.43
Electrical products	2.70	5.44	8.93	2.33	1.59
Nonmetallic minerals	2.73	2.56	3.35	4.89	2.68
Petroleum and coal products	0.83	0.50	0.37	1.86	0.79
Chemicals and chemical products	1.71	3.54	3.93	2.75	1.75
Miscellaneous manufacturing industries	1.34	4.09	6.23	2.83	*
Total	100.00	100.00	100.00	100.00	100.00

* Data from Statistics Canada with exclusions where necessary under the confidentiality provisions of the Statistics Act.

Table C-3

Distribution of Employment Dependence, by Industry and Market, Atlantic Region, 1970

	Local market	Interregional exports	Foreign exports
		(Per cent)	
Food and beverages	42.78	25.99	31.23
Tobacco products	–	–	–
Rubber	–	–	–
Leather	43.87	54.15	1.98
Textiles	13.45	75.10	11.45
Knitting mills	11.41	87.28	1.31
Clothing	8.15	84.29	7.56
Wood	64.35	15.63	20.02
Furniture and fixtures	81.75	14.22	4.03
Paper and allied products	8.05	9.67	82.28
Printing and publishing	97.89	1.42	0.69
Primary metals	22.38	49.43	28.19
Metal fabricating industries	63.61	31.53	5.16
Machinery	52.86	5.50	41.64
Transportation equipment	10.52	80.12	9.36
Electrical products	30.37	38.57	31.06
Nonmetallic minerals	88.45	9.40	2.15
Petroleum and coal products	64.60	32.86	2.54
Chemicals and chemical products	40.69	1.96	57.53
Miscellaneous manufacturing industries	45.18	39.55	15.27
Total	37.37	31.50	31.13

Table C-4

Distribution of Employment Dependence, by Industry and Market, Quebec, 1970

	Local market	Interregional exports	Foreign exports
		(Per cent)	
Food and beverages	74.91	14.86	10.23
Tobacco products	32.02	67.35	0.63
Rubber	41.45	51.17	7.38
Leather	46.98	48.13	4.89
Textiles	56.02	38.20	5.78
Knitting mills	56.30	40.47	3.23
Clothing	12.54	82.53	4.93
Wood	59.31	13.98	26.71
Furniture and fixtures	60.61	34.14	5.25
Paper and allied products	31.46	19.20	49.34
Printing and publishing	81.21	15.48	3.31
Primary metals	19.45	13.88	66.67
Metal fabricating industries	60.08	32.40	7.52
Machinery	35.65	34.46	29.89
Transportation equipment	36.19	17.00	46.81
Electrical products	34.83	43.74	21.43
Nonmetallic minerals	72.45	17.38	10.17
Petroleum and coal products	80.77	16.73	2.50
Chemicals and chemical products	38.29	42.24	19.47
Miscellaneous manufacturing industries	38.10	45.44	16.46
Total	43.06	37.05	19.89

Table C-5

Distribution of Employment Dependence, by Industry and Market, Ontario, 1970

	Local market	Interregional exports	Foreign exports
		(Per cent)	
Food and beverages	70.14	21.16	8.70
Tobacco products	30.25	50.98	18.77
Rubber	47.72	45.82	6.46
Leather	48.55	44.10	7.35
Textiles	59.16	34.98	5.86
Knitting mills	51.40	47.32	1.28
Clothing	23.55	73.11	3.34
Wood	72.95	9.72	17.33
Furniture and fixtures	65.83	28.86	5.31
Paper and allied products	49.96	14.85	35.19
Printing and publishing	78.17	20.11	1.72
Primary metals	46.56	16.04	37.40
Metal fabricating industries	67.15	26.82	6.03
Machinery	36.24	26.34	37.42
Transportation equipment	12.53	7.45	80.02
Electrical products	44.70	41.26	14.04
Nonmetallic minerals	76.34	15.47	8.19
Petroleum and coal products	88.18	6.80	5.02
Chemicals and chemical products	53.74	35.45	10.81
Miscellaneous manufacturing industries	50.99	33.92	15.09
Total	50.92	26.60	24.32

Table C-6

Distribution of Employment Dependence, by Industry and Market, Prairies, 1970

	Local market	Interregional exports	Foreign exports
		(Per cent)	
Food and beverages	55.07	38.98	5.99
Tobacco products	–	–	–
Rubber	17.41	77.18	5.41
Leather	49.76	44.62	5.62
Textiles	53.78	40.66	5.56
Knitting mills	31.33	53.80	14.87
Clothing	3.38	89.39	7.30
Wood	55.58	28.11	16.31
Furniture and fixtures	68.69	29.51	1.80
Paper and allied products	38.02	21.63	40.35
Printing and publishing	85.55	12.95	1.50
Primary metals	45.32	5.35	49.33
Metal fabricating industries	79.08	19.05	1.87
Machinery	34.75	30.87	34.38
Transportation equipment	42.79	42.37	15.14
Electrical products	35.97	54.81	9.22
Nonmetallic minerals	81.74	17.56	0.70
Petroleum and coal products	74.92	17.16	7.92
Chemicals and chemical products	28.23	33.37	38.40
Miscellaneous manufacturing industries	74.45	15.42	10.13
Total	52.42	34.85	12.73

Table C-7

Distribution of Employment Dependence, by Industry and Market, Pacific Region, 1970

	Local market	Interregional exports	Foreign exports
		(Per cent)	
Food and beverages	71.31	18.70	9.99
Tobacco products	–	–	–
Rubber	98.26	–	1.74
Leather	94.06	2.74	3.20
Textiles	81.99	14.88	3.13
Knitting mills	18.73	71.75	9.52
Clothing	82.70	–	17.30
Wood	22.79	16.91	60.30
Furniture and fixtures	90.40	7.32	2.28
Paper and allied products	16.19	6.18	77.63
Printing and publishing	92.18	6.71	1.11
Primary metals	11.73	2.06	86.21
Metal fabricating industries	78.44	15.41	6.15
Machinery	40.96	19.80	39.24
Transportation equipment	60.33	19.12	20.55
Electrical products	43.69	30.38	25.93
Nonmetallic minerals	88.04	3.20	8.76
Petroleum and coal products	94.57	1.35	4.08
Chemicals and chemical products	50.00	20.09	29.91
Miscellaneous manufacturing industries	79.48	9.60	10.92
Total	41.70	13.74	44.57

Table C-8

Regional Use by Industry and Source of Supply, Atlantic Region, 1970

	Local supply	Interregional imports	Foreign imports
		(Per cent)	
Food and beverages	55.71	37.39	6.90
Tobacco products	–	98.98	1.02
Rubber	–	92.66	7.34
Leather	12.02	84.21	3.77
Textiles	8.71	68.66	22.63
Knitting mills	10.30	87.92	1.78
Clothing	1.79	96.96	1.25
Wood	74.97	20.84	4.19
Furniture and fixtures	13.76	84.73	1.51
Paper and allied products	40.37	55.66	3.97
Printing and publishing	53.71	40.25	6.04
Primary metals	31.94	52.72	15.34
Metal fabricating industries	25.33	64.47	10.20
Machinery	3.60	36.82	59.58
Transportation equipment	35.72	38.26	26.02
Electrical products	8.79	82.91	8.30
Nonmetallic minerals	63.76	29.05	7.19
Petroleum and coal products	72.03	7.74	20.23
Chemicals and chemical products	17.67	74.81	7.52
Miscellaneous manufacturing industries	12.58	67.63	19.79
Total	32.21	52.90	14.89

Table C-9

Regional Use by Industry and Source of Supply, Quebec, 1970

	Local supply	Interregional imports	Foreign imports
		(Per cent)	
Food and beverages	68.44	22.82	8.74
Tobacco products	41.95	55.59	2.46
Rubber	32.13	46.81	21.06
Leather	47.44	24.56	28.00
Textiles	51.11	19.53	29.36
Knitting mills	59.68	10.65	29.67
Clothing	53.10	20.01	26.89
Wood	71.01	19.04	9.95
Furniture and fixtures	75.19	18.05	6.76
Paper and allied products	69.21	23.14	7.65
Printing and publishing	74.31	15.57	10.12
Primary metals	40.52	36.08	23.40
Metal fabricating industries	55.91	28.27	15.82
Machinery	14.36	24.90	60.74
Transportation equipment	33.85	17.89	48.26
Electrical products	33.49	43.91	22.60
Nonmetallic minerals	67.90	17.39	14.71
Petroleum and coal products	78.06	5.85	16.09
Chemicals and chemical products	34.91	37.51	27.58
Miscellaneous manufacturing industries	31.28	27.65	41.07
Total	52.79	25.29	21.92

Table C-10

Regional Use by Industry and Source of Supply, Ontario, 1970

	Local supply	Interregional imports	Foreign imports
		(Per cent)	
Food and beverages	77.72	14.61	7.67
Tobacco products	50.09	47.11	2.80
Rubber	59.06	16.56	24.38
Leather	48.58	31.16	20.26
Textiles	50.92	27.85	21.23
Knitting mills	36.14	46.32	17.54
Clothing	11.86	83.67	4.47
Wood	60.50	29.45	10.05
Furniture and fixtures	75.06	17.47	7.47
Paper and allied products	65.98	24.44	9.58
Printing and publishing	73.05	7.13	19.82
Primary metals	70.86	9.45	19.69
Metal fabricating industries	73.76	9.35	16.89
Machinery	26.93	3.59	69.48
Transportation equipment	15.73	3.76	80.51
Electrical products	52.74	13.78	33.48
Nonmetallic minerals	76.07	5.75	18.18
Petroleum and coal products	80.80	13.75	5.45
Chemicals and chemical products	59.41	14.13	26.46
Miscellaneous manufacturing industries	48.70	8.06	43.24
Total	54.48	13.29	32.23

Table C-11

Regional Use by Industry and Source of Supply, Prairies, 1970

	Local supply	Interregional imports	Foreign imports
		(Per cent)	
Food and beverages	74.52	22.27	3.21
Tobacco products	–	99.86	0.14
Rubber	6.95	84.07	8.98
Leather	16.14	66.51	17.35
Textiles	13.92	70.49	15.59
Knitting mills	9.37	82.02	8.61
Clothing	25.07	72.54	2.39
Wood	52.93	43.28	3.79
Furniture and fixtures	46.78	49.49	3.73
Paper and allied products	42.03	53.18	40.12
Printing and publishing	65.95	24.12	9.93
Primary metals	35.11	56.17	8.72
Metal fabricating industries	46.46	45.16	8.38
Machinery	13.01	24.15	62.84
Transportation equipment	21.73	38.15	40.12
Electrical products	12.56	75.95	11.49
Nonmetallic minerals	77.77	16.38	5.85
Petroleum and coal products	95.74	3.25	1.01
Chemicals and chemical products	21.48	68.34	10.18
Miscellaneous manufacturing industries	18.03	54.84	27.13
Total	44.15	41.62	14.23

Table C-12

Regional Use by Industry and Source of Supply, Pacific Region, 1970

	Local supply	Interregional imports	Foreign imports
		(Per cent)	
Food and beverages	57.36	30.89	11.75
Tobacco products	–	99.69	0.31
Rubber	3.49	73.33	23.18
Leather	10.20	68.78	21.02
Textiles	15.23	57.86	26.91
Knitting mills	2.87	73.67	23.49
Clothing	0.09	89.94	9.97
Wood	86.27	5.18	8.55
Furniture and fixtures	51.96	40.52	7.52
Paper and allied products	73.80	16.19	10.01
Printing and publishing	67.01	21.86	11.13
Primary metals	17.68	42.69	39.63
Metal fabricating industries	53.91	32.62	13.47
Machinery	12.02	25.60	62.38
Transportation equipment	19.72	15.51	64.77
Electrical products	11.59	65.02	23.39
Nonmetallic minerals	62.42	21.63	15.95
Petroleum and coal products	82.30	11.15	6.55
Chemicals and chemical products	29.33	56.77	13.90
Miscellaneous manufacturing industries	22.98	41.74	35.28
Total	42.22	33.53	24.25

Table C-13

Regional Shipments Distribution Shares, Agriculture, 1970

(from detailed estimates)

Region	Local market	Interregional exports	Foreign exports	Total
		(horizontal shares)		
Atlantic	66.8	10.9	22.3	100.0
Quebec	64.5	30.9	4.6	100.0
Ontario	74.9	4.6	20.5	100.0
Prairies	31.6	30.9	37.5	100.0
Pacific	26.5	7.7	65.8	100.0
Canada	48.9	21.1	30.0	100.0
		(vertical shares)		
Atlantic	5.0	1.9	2.7	3.6
Quebec	19.8	22.0	2.3	15.0
Ontario	40.9	5.8	18.3	26.7
Prairies	29.5	67.0	57.2	45.8
Pacific	4.8	3.3	19.5	8.9
Canada	100.0	100.0	100.0	100.0

Table C-14

Regional Shipments Distribution Shares, Forestry, 1970

(from detailed estimates)

Region	Local market	Interregional exports	Foreign exports	Total
		(horizontal shares)		
Atlantic	76.81	7.73	15.46	100.00
Quebec	82.96	14.64	2.40	100.00
Ontario	82.15	14.49	3.36	100.00
Prairies	93.63	0.72	5.65	100.00
Pacific	93.92	1.43	4.65	100.00
Canada	88.30	6.75	4.95	100.00
		(vertical shares)		
Atlantic	7.80	10.26	27.98	8.96
Quebec	21.29	49.14	10.95	22.66
Ontario	12.66	29.22	9.22	13.61
Prairies	2.35	0.24	2.53	2.22
Pacific	55.90	11.14	49.32	52.55
Canada	100.00	100.00	100.00	100.00

Table C-15

Regional Shipments Distribution Shares, Mining, 1970

(from detailed estimates)

Region	Local market	Interregional exports	Foreign exports	Total
		(horizontal shares)		
Atlantic	20.3	15.0	64.7	100.0
Quebec	48.7	2.2	49.1	100.0
Ontario	76.4	6.0	17.6	100.0
Prairies	31.9	20.5	47.6	100.0
Pacific	44.3	0.4	55.3	100.0
Canada	47.5	10.7	41.8	100.0
		(vertical shares)		
Atlantic	4.0	13.0	14.3	9.3
Quebec	14.9	3.0	17.1	14.6
Ontario	45.7	15.9	11.9	28.4
Prairies	23.6	67.6	40.0	35.1
Pacific	11.8	0.5	16.7	12.6
Canada	100.0	100.0	100.0	100.0

D The Cash Costs of the Tariff, 1968-70

The Estimation of Final Demand and Interregional Flows of Finished Goods, by Industry

The transportation equipment industry in Ontario in 1968 is used to illustrate the procedure of estimating final demand and net interregional flows of finished goods.[1] The approach relies upon six constant relations that draw, at the national level, on the 1961 input-output table (aggregation M). After listing the necessary abbreviations and known values, this technical note presents the assumed constants and relates them to the findings in Tables D-1 through D-10.

Abbreviations

Total industry shipments = S
Final usage = P_3
Intermediate usage = $P_1 + P_2$
Imports (plus duties) = M
Imports for final use = M_3
Personal income = Y_p
Exports abroad = X
Shipments plus imports = T

DPU = domestic production and use = T-X-M,
DPU_3 = final domestic production for local use = P_3-X-M_3,
$DP_{3\ Reg}^{68}$ = availability within a region (final values) in 1968,
EU_{Reg}^{68} = end use within a region (final values) in 1968,
B_{Reg}^{68} = a region's interregional trade balance,
$B_{Reg}^{68} = DP_{3\ Reg}^{68} - EU_{Reg}^{68}$

1 As discussed in the text, this industry presented particular problems.

Knowns

1961		1968	
S_{Can}	S_{Reg}	S_{Can}	S_{Reg}
$P_{3\ Can}$	–	–	–
M_{Can}	–	M_{Can}	M_{Reg}
X_{Can}	–	X_{Can}	X_{Reg}
$Y_{p\ Can}$	$Y_{p\ Reg}$	$Y_{p\ Can}$	$Y_{p\ Reg}$

As well as the input-output coefficients from aggregation *M* for 1961.

Fundamental assumptions

The illustrative figures for transportation equipment, in parenthesis, are in thousands of dollars.

A. Canada level

1/ $$M_{3\ Can}^{61} = \frac{P_{3\ Can}^{61}}{T_{Can}^{61}} M_{Can}^{61} \quad = \quad 612{,}630$$

2/ $$M_{3\ Can}^{68} = \frac{M_{3}^{61}}{M_{Can}^{61}} M_{Can}^{68} \quad = \quad 2{,}601{,}902$$

3/ $$DPU_{3\ Can}^{68} = \frac{DPU_{3\ Can}^{61}}{DPU_{Can}^{61}} DPU_{Can}^{68} \quad = \quad 1{,}732{,}697$$

Assumption 1-3 gives

$$P_{3\ Can}^{68} = DPU_{3\ Can}^{68} + M_{3\ Can}^{68} + X_{Can}^{68} \quad = \quad 7{,}397{,}343$$

$$DP_{3\ Can}^{68} = P_{3\ Can}^{68} - X_{Can}^{68} \quad = \quad 4{,}334{,}599$$

$$EU_{Can}^{68} = \frac{DP_{3\ Can}^{68}}{Y_{p\ Can}^{68}} \quad = \quad 7.86 \text{ per cent}$$

B. Regional level (Ontario)

$$4/ \quad DP_{3\ Ont}^{68} = \frac{T_{Ont}^{68}}{T_{Can}^{68}} DP_{3\ Can}^{68} = 3{,}313{,}628$$

$$5/ \quad M_{3\ Ont}^{68} = \frac{DP_{3\ Ont}^{68} + X_{Ont}^{68}}{T_{3\ Ont}^{68}} M_{Ont}^{68} = 2{,}062{,}405$$

$$6/ \quad EU_{Ont}^{68} = \frac{DP_{3\ Can}^{68}}{Y_{p\ Can}^{68}} Y_{p\ Ont}^{68} = 1{,}760{,}714$$

Assumption 4-6 gives

$$DPU_{3\ Ont}^{68} = DP_{3\ Ont}^{68} - M_{3\ Ont}^{68} = 1{,}251{,}223$$

$$B_{Ont}^{68} = DP_{3\ Ont}^{68} - EU_{Ont}^{68} = 1{,}552{,}914$$

The detailed tables

In Table D-1, for Ontario there are three columns for final usage:

1/ Local production for local use = $DPU_{3\ Ont}^{68}$

2/ Interregional balance = B_{Ont}^{68}

3/ Imports (from abroad) = $M_{3\ Ont}^{68}$

These columns add up to total regional use (EU^{68}) of finished transportation equipment plus the net interregional export surplus.

The three columns are converted into the regional cash cost estimates shown in Tables D-3 and D-4 using the assumption that the final sales values in Canada exceed the corresponding world prices by $t/1+t$, where t is the 1968 average ad valorem tariff levied upon Canada's dutiable transportation equipment imports. Thus the 1968 gross cash cost paid by users of transportation equipment in Ontario consisted of:

column 2 *To Ontario Producers* – local production for local use ($DPU_{3\ Ont}^{68}$) times the tariff markup ($t/1+t$) (= 175,922),

plus

column 3 *Transfers out* – Ontario's net interregional *imports* multiplied by the tariff markup (= 0),

plus

column 5 Estimated duty paid from Ontario to the federal government[2] (= 289,974).

However, since Ontario had a positive balance on net interregional trade in finished transportation equipment, this gross cash cost (465,896) was partially offset by

column 4 *Transfers in* – Ontario's net interregional *exports* multiplied by the tariff markup (= 218,340).

Tables D-5 through D-8 show the corresponding figures, when the alternative approach is used for estimating interregional trade in finished goods. This alternative replaces assumption 6 with 7.

$$6/ \quad EU^{68}_{Ont} = \frac{DP^{68}_{Ont}}{Y^{68}_{p\ Can}} \; Y^{68}_{p\ Ont},$$

$$7/ \quad EU^{68}_{Ont} = DP^{68}_{3\ Can}\ k_i + M^{68}_{3\ Ont},$$

where k_i = the share of total domestic production for domestic use shown in the *1967 Study* to be used in Ontario, in industry *i*.

2 As explained in the text these figures exceed the actual duties recorded. The excess duties were therefore redirected to local producers.

Table D-1

Estimates of Final Usage and Net Interregional Flows of Finished Goods, by Industry and Region, 1968

	Canada		Ontario			Quebec		
	Final value	Share of personal income	Local origin	Inter-regional balance	Imports	Local origin	Inter-regional balance	Imports
	(Thousands of dollars)	(Per cent)	(Thousands of dollars)					
Food and beverages	5,204,723	9.45	1,947,130	7,495	174,523	1,307,850	87,335	128,029
Tobacco products	352,141	0.64	196,980	59,448	5,508	144,588	57,698	4,350
Rubber	212,951	0.39	119,019	63,078	30,560	39,848	-4,594	10,734
Leather	366,903	0.67	137,590	15,457	26,904	137,752	82,084	39,396
Textiles	420,455	0.76	122,887	-2,468	45,434	154,595	118,724	73,069
Knitting mills	371,354	0.67	89,661	-44,458	16,725	189,947	139,053	45,327
Clothing	1,226,865	2.23	266,064	-203,794	28,494	732,891	473,410	58,400
Wood	67,521	0.12	2,186	-15,895	9,346	1,135	-5,713	10,647
Furniture and fixtures	634,507	1.15	286,652	50,100	21,185	217,686	72,708	19,723
Paper and allied products	161,485	0.29	23,175	-8,350	34,070	29,739	14,065	26,167
Printing and publishing	489,479	0.89	217,660	66,188	47,354	119,682	8,022	15,164
Primary metals	–	–	–	–	–	–	–	–
Metal fabricating industries	437,129	0.79	157,270	83,705	103,997	55,662	-5,560	52,038
Machinery	1,792,062	3.25	416,689	415,579	726,826	78,558	-173,346	212,419
Transportation equipment	4,334,599	7.89	1,251,223	1,552,914	2,062,405	329,295	-494,665	299,135
Electrical products	1,551,299	2.86	760,508	381,652	251,281	301,413	3,443	103,972
Nonmetallic minerals	122,247	0.22	47,851	14,525	16,331	23,256	-1,178	7,240
Petroleum and coal products	738,977	1.34	223,245	-59,894	17,033	186,209	31,717	36,977
Chemicals and chemical products	1,118,932	2.03	497,098	209,352	166,765	207,687	23,162	105,390
Miscellaneous manufacturing industries	1,135,465	2.06	442,032	271,830	291,024	158,301	1,715	137,613
Total		37.72		2,856,464			428,080	

Table D-1 (cont'd)

	Atlantic			Prairies			Pacific		
	Local origin	Inter-regional balance	Imports	Local origin	Inter-regional balance	Imports	Local origin	Inter-regional balance	Imports
	(Thousands of dollars)								
Food and beverages	329,619	18,067	38,875	823,975	5,691	25,852	373,874	-118,589	54,995
Tobacco products	-16	-23,291	446	-2	-56,997	115	9	-36,859	163
Rubber	60	-13,784	498	115	-34,243	177	2,382	-10,457	9,558
Leather	2,199	-21,896	604	8,354	-43,314	7,845	2,594	-32,331	3,665
Textiles	3,000	-22,170	3,134	5,137	-58,554	4,508	5,250	-35,532	3,441
Knitting mills	12,000	-12,681	318	3,317	-52,277	4,641	3,481	-29,637	5,940
Clothing	2,886	-78,872	831	96,255	-95,848	6,900	20,908	-94,896	13,236
Wood	1,553	-1,889	1,103	2,895	-6,358	1,699	17,589	29,855	19,368
Furniture and fixtures	5,250	-37,041	422	44,360	-55,421	3,139	32,481	-30,346	3,908
Paper and allied products	11,547	3,570	2,893	3,203	-20,723	2,268	16,880	11,438	11,543
Printing and publishing	10,782	-21,070	1,098	39,623	-34,501	5,272	28,882	-18,638	3,963
Primary metals	–	–	–	–	–	–	–	–	–
Metal fabricating industries	3,475	-20,592	5,359	22,639	-38,784	9,482	14,458	-18,769	12,749
Machinery	909	-86,553	33,176	32,621	-69,020	189,039	19,928	-86,660	81,897
Transportation equipment	57,837	-200,768	33,189	40,722	-573,053	89,316	53,620	-284,428	117,857
Electrical products	21,339	-73,605	9,485	28,246	-206,998	16,385	26,328	-104,492	32,342
Nonmetallic minerals	3,170	-4,497	562	14,539	-4,321	969	6,508	-4,528	1,822
Petroleum and coal products	53,703	26,988	23,032	122,564	4,247	1,548	67,314	-3,058	7,352
Chemicals and chemical products	10,664	-60,150	4,509	49,548	-107,031	24,917	43,595	-65,332	8,760
Miscellaneous manufacturing industries	6,611	-62,630	7,196	19,073	-137,305	27,799	16,128	-73,610	29,688
Total		-692,864			-1,584,810			-1,006,869	

Table D-2

Estimates of Final Usage and Net Interregional Flows of Finished Goods, by Industry and Region, 1970

	Canada		Ontario			Quebec		
	Final value DP_3	Share of personal income	Local origin	Inter-regional balance	Imports	Local origin	Inter-regional balance	Imports
	(Thousands of dollars)	(Per cent)	(Thousands of dollars)					
Food and beverages	5,869,226	8.89	2,161,773	-82,577	189,674	1,466,700	147,657	183,257
Tobacco products	366,924	0.56	197,265	51,450	6,352	159,001	68,823	3,741
Rubber	234,602	0.36	129,740	65,224	32,776	41,432	-3,034	15,583
Leather	384,751	0.58	135,611	12,207	36,157	136,113	85,737	48,106
Textiles	458,490	0.70	138,269	-454	51,417	161,526	122,820	78,649
Knitting mills	440,708	0.67	82,689	-74,369	25,708	218,848	184,573	78,529
Clothing	1,316,497	2.00	269,495	-246,579	29,890	795,504	522,989	64,458
Wood	66,948	0.10	2,435	-16,151	9,178	1,932	-4,685	10,519
Furniture and fixtures	684,611	1.04	312,895	54,625	25,645	237,671	78,168	15,731
Paper and allied products	194,483	0.30	22,496	-13,476	44,682	36,261	17,612	31,131
Printing and publishing	554,903	0.84	241,669	68,630	57,085	134,388	9,549	17,195
Primary metals	–	–	–	–	–	–	–	–
Metal fabricating industries	362,052	0.55	176,923	68,283	41,507	65,832	-7,811	19,029
Machinery	2,098,187	3.18	459,478	476,751	887,411	95,809	-185,737	255,511
Transportation equipment	3,946,765	5.98	731,407	1,371,740	2,277,094	276,957	-454,084	279,182
Electrical products	1,717,414	2.60	833,346	395,590	274,472	288,757	16,448	167,285
Nonmetallic minerals	130,789	0.20	51,386	15,525	18,378	23,557	-1,489	8,431
Petroleum and coal products	775,708	1.18	237,114	-67,789	16,791	196,273	34,060	36,339
Chemicals and chemical products	1,248,865	1.82	558,482	224,659	184,093	239,923	41,858	121,598
Miscellaneous manufacturing industries	1,333,197	2.02	487,519	313,436	378,806	163,549	-7,242	170,457
Total		33.54		2,616,725			666,212	

Table D-2 (cont'd)

	Atlantic			Prairies			Pacific		
	Local origin	Inter-regional balance	Imports	Local origin	Inter-regional balance	Imports	Local origin	Inter-regional balance	Imports
	(Thousands of dollars)								
Food and beverages	383,266	30,884	44,248	931,462	65,286	32,910	399,114	-161,250	76,822
Tobacco products	1	-24,433	362	–	-56,127	81	–	-39,713	121
Rubber	39	-15,131	684	6,057	-26,956	2,924	837	-20,102	4,531
Leather	2,142	-23,161	697	9,822	-41,028	8,088	2,341	-33,756	5,673
Textiles	3,786	-23,593	3,605	5,148	-59,208	5,879	3,505	-39,565	6,706
Knitting mills	11,757	-17,676	349	6,715	-55,859	4,937	3,575	-36,669	7,601
Clothing	2,622	-85,253	1,091	106,822	-85,200	9,648	21,599	-105,957	15,368
Wood	2,169	-1,200	1,156	3,265	-5,136	1,854	15,295	27,173	19,146
Furniture and fixtures	5,631	-39,993	640	45,341	-55,582	3,951	32,035	-37,218	5,071
Paper and allied products	13,796	4,401	3,748	2,903	-22,413	4,476	18,671	13,875	16,318
Printing and publishing	12,472	-23,554	1,473	45,876	-32,293	6,834	32,517	-22,332	5,394
Primary metals	–	–	–	–	–	–	–	–	–
Metal fabricating industries	4,757	-17,446	2,263	21,529	-29,983	3,949	20,102	-13,043	6,161
Machinery	3,046	-90,616	48,129	34,866	-109,686	176,862	23,680	-90,712	113,395
Transportation equipment	55,597	-186,003	25,114	57,118	-483,465	64,008	54,303	-248,188	125,985
Electrical products	18,568	-90,092	7,399	38,262	-204,108	20,684	31,936	-117,838	36,675
Nonmetallic minerals	3,799	-4,554	486	13,890	-5,150	995	6,677	-4,332	3,190
Petroleum and coal products	59,937	24,901	17,385	133,715	16,379	1,491	70,400	-7,551	6,263
Chemicals and chemical products	15,396	-59,405	9,594	46,121	-123,009	22,174	34,388	-84,104	17,090
Miscellaneous manufacturing industries	7,860	-74,123	8,112	22,701	-146,381	35,146	21,743	-85,690	37,304
Total		-716,047			-1,459,919			-1,106,972	

Table D-3

Cash Cost Estimates and Implicit Interregional Transfers, 1968

	Canada	Ontario				Quebec			
			Transfers				Transfers		
	Gross cash cost (1)	To Ontario producers (2)	out (3)	in (4)	Duty to Government (5)	To Quebec producers (6)	out (7)	in (8)	Duty to Government (9)
					(Thousands of dollars)				
Food and beverages	922,277	345,031		1,328	30,925	231,751		15,476	22,687
Tobacco products	97,508	54,544		16,461	1,525	40,036		15,977	1,205
Rubber	34,115	19,067		10,105	4,896	6,384	736		1,720
Leather	58,741	22,028		2,475	4,307	22,054		13,142	6,307
Textiles	77,153	22,550	453		8,337	28,368		21,786	13,408
Knitting mills	77,390	18,685	9,265		3,485	39,585		28,979	9,446
Clothing	229,670	49,807	38,150		5,334	137,197		88,622	10,932
Wood	8,156	264	1,920		1,129	137	690		1,286
Furniture and fixtures	100,379	45,348		7,926	3,351	34,390		11,502	3,120
Paper and allied products	22,850	3,279	1,182		4,821	4,208		1,990	3,703
Printing and publishing	68,184	30,320		9,220	6,596	16,672		1,117	2,112
Metal fabricating industries	59,362	21,357		11,367	14,123	7,559	755		7,067
Machinery	208,596	48,503		48,373	84,603	9,144	20,177		24,726
Transportation equipment	609,444	175,922		218,340	289,974	46,299	69,550		42,058
Electrical products	217,802	106,775		53,584	35,280	42,318		483	14,598
Nonmetallic minerals	15,513	6,072		1,843	2,072	2,951	149		919
Petroleum and coal products	50,620	15,292	4,103		1,167	12,755		2,173	2,533
Chemicals and chemical products	128,230	56,967		23,992	19,111	23,801		2,654	12,078
Miscellaneous manufacturing industries	161,917	63,034		38,763	41,500	22,574		245	19,624
Total	3,147,907	1,104,845	55,073	443,777	562,536	728,183	92,057	204,146	199,529

Table D-3 (cont'd)

	Atlantic				Prairies				Pacific			
	To Atlantic producers (10)	Transfers out (11)	Transfers in (12)	Duty to Government (13)	To Prairies producers (14)	Transfers out (15)	Transfers in (16)	Duty to Government (17)	To Pacific producers (18)	Transfers out (19)	Transfers in (20)	Duty to Government (21)
	(Thousands of dollars)											
Food and beverages	58,408		3,201	6,889	146,008		1,008	4,581	66,250	21,014		9,745
Tobacco products	-4	6,449		123	-1	15,782		32	2	10,206		45
Rubber	10	2,208		80	18	5,486		28	382	1,675		1,531
Leather	352	3,506		97	1,337	6,935		1,256	415	5,176		587
Textiles	552	4,068		575	943	10,745		827	963	6,520		631
Knitting mills	2,501	2,643		66	691	10,895		967	725	6,176		1,238
Clothing	540	14,765		156	18,019	17,943		1,292	3,914	17,765		2,478
Wood	188	228		133	350	768		205	2,125		3,606	2,340
Furniture and fixtures	831	5,860		67	7,018	8,768		497	5,138	4,801		618
Paper and allied products	1,634		505	409	453	2,932		321	2,389		1,618	1,633
Printing and publishing	1,502	2,935		153	5,519	4,806		734	4,023	2,596		552
Metal fabricating industries	472	2,796		728	3,074	5,267		1,288	1,963	2,549		1,731
Machinery	106	10,075		3,862	3,797	8,034		22,004	2,320	10,087		9,533
Transportation equipment	8,132	28,228		4,666	5,725	80,751		12,558	7,539	39,991		16,571
Electric products	2,996	10,334		1,332	3,966	29,063		2,300	3,696	14,671		4,541
Nonmetallic minerals	402	571		71	1,845	548		123	826	575		231
Petroleum and coal products	3,679		1,849	1,578	8,396		291	106	4,611	209		504
Chemicals and chemical products	1,222	6,893		517	5,678	12,266		2,855	4,996	7,487		1,004
Miscellaneous manufacturing industries	943	8,931		1,026	2,720	19,580		3,964	2,300	10,497		4,234
Total	84,466	110,490	5,555	22,528	215,556	240,389	1,299	55,938	114,577	161,995	5,224	59,747

Table D-4

Cash Cost Estimates and Implicit Interregional Transfers, 1970

	Canada	Ontario				Quebec			
	Gross cash cost (1)	To Ontario producers (2)	Transfers out (3)	Transfers in (4)	Duty to Government (5)	To Quebec producers (6)	Transfers out (7)	Transfers in (8)	Duty to Government (9)
	(Thousands of dollars)								
Food and beverages	1,009,507	371,825	14,203		32,624	252,272		25,397	31,520
Tobacco products	103,546	55,668		14,519	1,793	44,870		19,422	1,056
Rubber	36,246	20,045		10,077	5,064	6,401	469		2,408
Leather	64,022	22,566		2,031	6,017	22,649		14,267	8,005
Textiles	81,611	24,612	81		9,152	28,752		21,862	14,000
Knitting mills	85,542	16,050	14,435		4,990	42,478		35,826	15,242
Clothing	241,050	49,345	45,148		5,473	145,657		95,759	11,802
Wood	7,344	267	1,772		1,007	212	514		1,154
Furniture and fixtures	105,430	48,186		8,412	3,949	36,601		12,038	2,423
Paper and allied products	25,944	3,061	1,798		5,961	4,837		2,349	4,153
Printing and publishing	76,201	33,109		9,402	7,821	18,411		1,308	2,356
Metal fabricating industries	48,189	23,548		9,088	5,525	8,762	1,040		2,533
Machinery	236,256	51,737		53,682	99,922	10,788	20,914		28,771
Transportation equipment	511,501	94,790		177,778	295,111	35,894	58,849		36,182
Electrical products	233,396	113,252		53,761	37,301	39,242		2,235	22,734
Nonmetallic minerals	16,166	6,351		1,919	2,272	2,912	184		1,042
Petroleum and coal products	54,687	16,717	4,779		1,184	13,837		2,401	2,562
Chemicals and chemical products	140,622	62,885		25,297	20,729	27,015		4,713	13,692
Miscellaneous manufacturing industries	189,180	69,179		44,477	53,753	23,208	1,028		24,188
Total	3,266,260	1,083,193	82,216	410,443	599,648	764,798	82,998	237,577	225,823

Table D-4 (cont'd)

	Atlantic				Prairies				Pacific			
	To Atlantic producers (10)	Transfers out (11)	Transfers in (12)	Duty to Government (13)	To Prairies producers (14)	Transfers out (15)	Transfers in (16)	Duty to Government (17)	To Pacific producers (18)	Transfers out (19)	Transfers in (20)	Duty to Government (21)
	(Thousands of dollars)											
Food and beverages	65,922		5,312	7,611	160,211		11,229	5,661	68,648	27,735		13,213
Tobacco products	0	6,895		102	0	15,839		23	0	11,207		34
Rubber	6	2,338		106	936	4,165		452	129	3,106		700
Leather	356	3,854		116	1,634	6,827		1,346	390	5,617		944
Textiles	674	4,200		642	916	10,539		1,046	624	7,043		1,194
Knitting mills	2,282	3,431		68	1,303	10,842		958	694	7,117		1,475
Clothing	480	15,610		200	19,559	15,600		1,767	3,955	19,401		2,814
Wood	238	132		127	358	563		203	1,678		2,981	2,100
Furniture and fixtures	867	6,159		99	6,983	8,560		608	4,933	5,732		781
Paper and allied products	1,840		587	500	387	2,990		597	2,491		1,851	2,177
Printing and publishing	1,709	3,227		202	6,285	4,424		936	4,455	3,059		739
Metal fabricating industries	633	2,322		301	2,865	3,991		526	2,676	1,736		820
Machinery	343	10,203		5,419	3,926	12,351		19,915	2,666	10,214		12,768
Transportation equipment	7,205	24,106		3,255	7,402	62,657		8,295	7,038	32,165		16,328
Electrical products	2,523	12,244		1,006	5,204	27,738		2,810	4,340	16,014		4,984
Nonmetallic minerals	470	563		60	1,717	637		123	825	535		394
Petroleum and coal products	4,226		1,756	1,226	9,427		1,155	105	4,963	532		442
Chemicals and chemical products	1,734	6,689		1,080	5,194	13,851		2,497	3,872	9,470		1,924
Miscellaneous manufacturing industries	1,115	10,518		1,151	3,221	20,771		4,987	3,085	12,159		5,293
Total	92,623	112,491	7,655	23,271	237,528	222,345	12,384	52,855	117,462	172,842	4,832	69,124

Table D-5

Alternative Estimates of Final Usage and Net Interregional Flows of Finished Goods, by Industry and Region, 1968

	Canada		Ontario			Quebec		
	Final value	Share of personal income	Local origin	Inter regional balance	Imports	Local origin	Inter regional balance	Imports
	(Thousands of dollars)	(Per cent)	(Thousands of dollars)					
Food and beverages	5,204,723	9.45	1,947,130	126,452	174,523	1,307,850	-135,015	128,029
Tobacco products	352,141	0.64	196,980	74,873	5,508	144,588	8,067	4,350
Rubber	212,951	0.39	119,019	42,020	30,560	39,848	-1,170	10,734
Leather	366,903	0.67	137,590	21,185	26,904	137,752	35,367	39,396
Textiles	420,455	0.76	122,887	7,848	45,434	154,595	21,493	73,069
Knitting mills	371,354	0.67	89,661	-8,902	16,725	189,947	59,452	45,327
Clothing	1,226,865	2.23	266,064	-119,992	28,494	732,891	337,323	58,400
Wood	67,521	0.12	2,186	-5,485	9,346	1,135	-4,903	10,647
Furniture and fixtures	634,507	1.15	286,652	41,474	21,185	217,686	46,412	19,723
Paper and allied products	161,485	0.29	23,175	-17,516	34,070	29,739	3,302	26,167
Printing and publishing	489,479	0.89	217,660	16,512	47,354	119,682	-3,973	15,164
Metal fabricating industries	437,129	0.79	157,270	35,005	103,997	55,662	-1,985	52,038
Machinery	1,792,062	3.25	416,689	158,962	726,826	78,558	-39,084	212,419
Transportation equipment	4,334,599	7.87	1,251,223	377,944	2,062,405	329,295	-49,819	299,135
Electrical products	1,551,299	2.86	760,508	256,675	251,281	301,413	-6,144	103,972
Nonmetallic minerals	122,247	0.22	47,851	5,632	16,331	23,256	-356	7,240
Petroleum and coal products	738,977	1.34	223,245	-19,619	17,033	186,209	25,824	36,977
Chemicals and chemical products	1,118,932	2.03	497,098	119,890	166,765	207,687	-3,679	105,390
Miscellaneous manufacturing industries	1,135,465	2.06	442,032	112,419	291,024	158,301	-12,445	137,613
Total		37.72		1,225,377			278,667	

Table D-5 (cont'd)

	Atlantic			Prairies			Pacific		
	Local origin	Inter-regional balance	Imports	Local origin	Inter-regional balance	Imports	Local origin	Inter-regional balance	Imports
	(Thousands of dollars)								
Food and beverages	329,619	-24,760	38,875	823,975	103,260	24,852	373,874	-69,936	54,995
Tobacco products	-16	-20,885	446	-2	-38,735	115	9	-23,319	163
Rubber	60	-7,349	498	115	-23,259	177	2,382	-10,241	9,558
Leather	2,199	-13,927	604	8,354	-26,265	7,845	2,594	-16,360	3,665
Textiles	3,000	-5,261	3,134	5,137	-16,591	4,508	5,250	-7,490	3,441
Knitting mills	12,000	-3,219	318	3,317	-32,402	4,641	3,481	-14,930	5,940
Clothing	2,886	-71,752	831	96,255	-73,945	6,900	20,908	-71,634	13,236
Wood	1,553	-171	1,103	2,895	-1,226	1,699	17,589	11,785	19,368
Furniture and fixtures	5,250	-27,338	422	44,360	-38,636	3,139	32,481	-21,912	3,908
Paper and allied products	11,547	7,590	2,893	3,203	-3,721	2,268	16,880	10,345	11,543
Printing and publishing	10,782	-5,966	1,098	39,623	-4,706	5,272	28,882	-1,865	3,963
Metal fabricating industries	3,475	-11,025	5,359	22,639	-13,637	9,482	14,458	-8,357	12,749
Machinery	909	-25,593	33,176	32,621	-68,999	189,039	19,928	-25,285	81,897
Transportation equipment	57,837	-66,744	33,189	40,722	-187,301	89,316	53,620	-74,080	117,857
Electrical products	21,339	-45,566	9,485	28,246	-127,865	16,385	26,328	-77,101	32,342
Nonmetallic minerals	3,170	-1,749	562	14,539	-1,494	969	6,508	-2,033	1,822
Petroleum and coal products	53,703	-5,788	23,032	122,564	8,283	1,548	67,314	-8,699	7,352
Chemicals and chemical products	10,664	-37,528	4,509	49,548	-60,420	24,917	43,595	-18,262	8,760
Miscellaneous manufacturing industries	6,611	-17,469	7,196	19,073	-52,847	27,799	16,128	-29,657	29,688
Total		-384,500			-660,506			-459,031	

Table D-6

Alternative Estimates of Final Usage and Net Interregional Flows of Finished Goods, by Industry and Region, 1970

	Canada		Ontario			Quebec		
	Final value DP_3	Share of personal income	Local origin	Inter-regional balance	Imports	Local origin	Inter-regional balance	Imports
	(Thousands of dollars)	(Per cent)	(Thousands of dollars)					
Food and beverages	5,869,226	8.89	2,161,773	127,954	189,674	1,466,700	-145,076	183,257
Tobacco products	366,924	0.56	197,265	69,899	6,352	159,001	16,601	3,741
Rubber	234,602	0.36	129,740	44,784	32,776	41,432	-3,824	15,583
Leather	384,751	0.58	135,611	20,198	36,157	136,113	34,601	48,106
Textiles	458,490	0.70	138,269	14,781	51,417	161,526	18,648	78,649
Knitting mills	440,708	0.67	82,689	-24,191	25,708	218,848	77,345	78,529
Clothing	1,316,497	2.00	269,495	-143,139	29,890	795,504	372,703	64,458
Wood	66,948	0.10	2,435	-5,156	9,178	1,932	-4,043	10,519
Furniture and fixtures	684,611	1.08	312,895	47,871	25,645	237,671	52,858	15,731
Paper and allied products	194,483	0.30	22,496	-22,808	44,682	36,261	6,827	31,131
Printing and publishing	554,903	0.84	241,669	16,239	57,085	134,388	-4,194	17,195
Metal fabricating industries	362,052	0.55	176,923	37,469	41,507	65,832	81	19,029
Machinery	2,098,187	3.18	459,478	169,730	887,411	95,809	-36,450	255,511
Transportation equipment	3,946,765	5.98	731,407	139,015	2,277,094	276,957	19,783	279,182
Electrical products	1,717,414	2.60	833,346	297,160	274,472	288,757	-38,549	167,285
Nonmetallic minerals	130,789	0.20	51,386	7,402	18,378	23,557	-1,042	8,431
Petroleum and coal products	775,708	1.18	237,114	-22,263	16,791	196,273	24,982	36,339
Chemicals and chemical products	1,248,865	1.82	558,482	141,284	184,093	239,923	6,149	121,598
Miscellaneous manufacturing industries	1,333,197	2.02	487,519	126,478	378,806	163,549	-23,478	170,457
Total		33.54		1,042,707			373,922	

Table D-6 (cont'd)

	Atlantic			Prairies			Pacific		
	Local origin	Inter-regional balance	Imports	Local origin	Inter-regional balance	Imports	Local origin	Inter-regional balance	Imports
	(Thousands of dollars)								
Food and beverages	386,266	−12,600	44,248	931,462	126,375	32,910	399,114	−96,653	76,822
Tobacco products	1	−21,767	362	–	−40,401	81	–	−24,333	121
Rubber	39	−8,136	684	6,057	−19,732	2,924	837	−13,091	4,531
Leather	2,142	−13,847	697	9,822	−24,502	8,088	2,341	−16,451	5,673
Textiles	3,786	−5,081	3,605	5,148	−18,176	5,879	3,505	−10,171	6,706
Knitting mills	11,757	−4,746	349	6,715	−32,018	4,937	3,575	−16,390	7,601
Clothing	2,622	−77,154	1,091	106,822	−75,096	9,648	21,599	−77,314	15,368
Wood	2,169	462	1,156	3,265	−813	1,854	15,295	9,551	19,146
Furniture and fixtures	5,631	−29,596	640	45,341	−44,373	3,951	32,035	−26,760	5,071
Paper and allied products	13,796	9,391	3,748	2,903	−4,806	4,476	18,671	11,395	16,318
Printing and publishing	12,472	−6,298	1,473	45,876	−3,805	6,834	32,517	−1,942	5,394
Metal fabricating industries	4,757	−11,782	2,263	21,529	−19,847	3,949	20,102	5,921	6,161
Machinery	3,046	−26,749	48,129	34,866	−79,380	176,862	23,680	−27,151	113,395
Transportation equipment	55,597	−28,913	25,114	57,118	−97,562	64,008	54,303	−32,323	125,985
Electrical products	18,568	−52,633	7,399	38,262	−127,843	20,684	31,936	−78,135	36,675
Nonmetallic minerals	3,799	−1,325	486	13,890	−2,814	995	6,677	−2,221	3,190
Petroleum and coal products	59,937	−3,600	17,385	133,715	11,663	1,491	70,400	−10,782	6,263
Chemicals and chemical products	15,396	−37,905	9,594	46,127	−75,501	22,174	34,388	−34,027	17,090
Miscellaneous manufacturing industries	7,860	−18,516	8,112	22,701	−56,077	35,146	21,743	−28,407	37,304
Total		−350,795			−584,708			−481,126	

Table D-7

Alternative Cash Cost Estimates and Implicit Interregional Transfers, 1968

	Canada	Ontario				Quebec			
	Gross cash cost (1)	To Ontario producers (2)	Transfers out (3)	Transfers in (4)	Duty to Government (5)	To Quebec producers (6)	Transfers out (7)	Transfers in (8)	Duty to Government (9)
	(Thousands of dollars)								
Food and beverages	992,277	345,031		22,407	30,925	231,751	23,925		22,687
Tobacco products	97,508	54,544		20,732	1,525	40,036		2,234	1,205
Rubber	34,115	19,067		6,732	4,896	6,384	187		1,720
Leather	58,741	22,028		3,392	4,307	22,054		5,662	6,307
Textiles	77,153	22,550		1,440	8,337	28,368		3,944	13,408
Knitting mills	77,390	18,685	1,855		3,485	39,585		12,390	9,446
Clothing	229,670	49,807	22,462		5,334	137,197		63,147	10,932
Wood	8,156	264	663		1,129	137	592		1,286
Furniture and fixtures	100,379	45,348		6,561	3,351	34,390		7,342	3,120
Paper and allied products	22,850	3,279	2,479		4,821	4,208		467	3,703
Printing and publishing	68,184	30,320		2,300	6,596	16,672	553		2,112
Metal fabricating industries	59,362	21,357		4,754	14,123	7,559	270		7,067
Machinery	208,596	48,503		18,503	84,603	9,144	4,549		24,726
Transportation equipment	609,444	175,922		53,139	289,974	46,299	7,005		42,058
Electrical products	217,802	106,775		36,037	35,280	42,318	863		14,598
Nonmetallic minerals	15,513	6,072		715	2,072	2,951	45		919
Petroleum and coal products	50,620	15,292	1,344		1,167	12,755		1,769	2,533
Chemicals and chemical products	128,230	56,967		13,739	19,111	23,801	422		12,078
Miscellaneous manufacturing industries	161,917	63,034		16,031	41,500	22,574	1,775		19,624
Total	3,147,907	1,104,845	28,803	206,482	562,536	728,183	40,186	96,955	199,529

Table D-7 (cont'd)

	Atlantic				Prairies				Pacific			
	To Atlantic producers (10)	Transfers out (11)	Transfers in (12)	Duty to Government (13)	To Prairies producers (14)	Transfers out (15)	Transfers in (16)	Duty to Government (17)	To Pacific producers (18)	Transfers out (19)	Transfers in (20)	Duty to Government (21)
	(Thousands of dollars)											
Food and beverages	58,408	4,387		6,889	146,008		18,298	4,581	66,250	12,393		9,745
Tobacco products	-4	5,783		123	-1	10,726		32	2	6,457		45
Rubber	10	1,177		80	18	3,726		28	382	1,641		1,531
Leather	352	2,230		97	1,337	4,205		1,256	415	2,619		587
Textiles	552	965		575	943	3,044		827	963	1,374		631
Knitting mills	2,501	671		66	691	6,753		967	725	3,111		1,238
Clothing	540	13,432		156	18,019	13,842		1,292	3,914	13,410		2,478
Wood	188	21		133	350	148		205	2,125		1,424	2,340
Furniture and fixtures	831	4,325		67	7,018	6,112		497	5,138	3,466		618
Paper and allied products	1,634		1,074	409	453	526		321	2,389		1,464	1,633
Printing and publishing	1,502	831		153	5,519	656		734	4,023	260		552
Metal fabricating industries	472	1,497		728	3,074	1,852		1,288	1,963	1,135		1,731
Machinery	106	2,979		3,862	3,797	8,031		22,004	2,320	2,943		9,533
Transportation equipment	8,132	9,384		4,666	5,725	26,335		12,558	7,539	10,416		16,571
Electrical products	2,996	6,397		1,332	3,966	17,952		2,300	3,696	10,825		4,541
Nonmetallic minerals	402	222		71	1,845	190		123	826	258		231
Petroleum and coal products	3,679	396		1,578	8,396		567	106	4,611	596		504
Chemicals and chemical products	1,222	4,301		517	5,678	6,924		2,855	4,996	2,093		1,004
Miscellaneous manufacturing industries	943	2,491		1,026	2,720	7,536		3,964	2,300	4,229		4,234
Total	84,466	61,489	1,074	22,528	215,556	118,558	18,865	55,938	114,577	77,226	2,888	59,747

Table D-8

Alternative Cash Cost Estimates and Implicit Interregional Transfers, 1970

	Canada	Ontario				Quebec			
	Gross cash cost (1)	To Ontario producers (2)	Transfers out (3)	Transfers in (4)	Duty to Government (5)	To Quebec producers (6)	Transfers out (7)	Transfers in (8)	Duty to Government (9)
	(Thousands of dollars)								
Food and beverages	1,009,507	371,825		22,008	32,624	252,272	24,953		31,520
Tobacco products	103,546	55,668		19,725	1,793	44,870		4,685	1,056
Rubber	36,246	20,045		6,919	5,064	6,401	591		2,408
Leather	64,022	22,566		3,361	6,017	22,649		5,758	8,005
Textiles	81,611	24,612		2,631	9,152	28,752		3,319	14,000
Knitting mills	85,542	16,050	4,695		4,990	42,478		15,013	15,242
Clothing	241,050	49,345	26,209		5,473	145,657		68,242	11,802
Wood	7,344	267	566		1,007	212	444		1,154
Furniture and fixtures	105,430	48,186		7,372	3,949	36,601		8,140	2,423
Paper and allied products	25,944	3,061	3,043		5,961	4,837		911	4,153
Printing and publishing	76,021	33,109		2,225	7,821	18,411	575		2,356
Metal fabricating industries	48,189	23,548		4,987	5,525	8,762		11	2,533
Machinery	236,256	51,737		19,112	99,922	10,788	4,104		28,771
Transportation equipment	511,501	94,790		18,016	295,111	35,894		2,564	36,182
Electrical products	233,396	113,252		40,384	37,301	39,242	5,239		22,734
Nonmetallic minerals	16,166	6,351		915	2,272	2,912	129		1,042
Petroleum and coal products	54,687	16,717	1,570		1,184	13,837		1,761	2,562
Chemicals and chemical products	140,622	62,885		15,909	20,729	27,015		692	13,692
Miscellaneous manufacturing industries	189,180	69,179		17,947	53,753	23,208	3,332		24,188
Total	3,266,260	1,083,193	36,083	181,511	599,648	764,798	39,367	11,096	225,823

Table D-8 (cont'd)

	Atlantic				Prairies				Pacific			
	To Atlantic producers (10)	Transfers out (11)	Transfers in (12)	Duty to Government (13)	To Prairies producers (14)	Transfers out (15)	Transfers in (16)	Duty to Government (17)	To Pacific producers (18)	Transfers out (19)	Transfers in (20)	Duty to Government (21)
	(Thousands of dollars)											
Food and beverages	65,922	2,167		7,611	160,211		21,737	5,661	68,648	16,624		13,213
Tobacco products	0	6,143		102	0	11,401		23	0	6,867		34
Rubber	6	1,257		106	937	3,049		452	129	2,022		700
Leather	356	2,304		116	1,634	4,077		1,346	390	2,737		944
Textiles	674	904		642	916	3,235		1,046	624	1,810		1,194
Knitting mills	2,282	921		68	1,303	6,215		958	694	3,181		1,475
Clothing	480	14,127		200	19,559	13,750		1,767	3,955	14,156		2,814
Wood	238		51	127	358	89		203	1,678		1,048	2,100
Furniture and fixtures	867	4,558		99	6,983	6,833		608	4,933	4,121		781
Paper and allied products	1,840		1,253	500	387	641		597	2,491		1,520	2,177
Printing and publishing	1,709	863		202	6,285	521		936	4,455	266		739
Metal fabricating industries	633	1,568		301	2,865	2,642		526	2,676	788		820
Machinery	343	3,012		5,419	3,926	8,938		19,915	2,666	3,057		12,768
Transportation equipment	7,205	3,747		3,255	7,402	12,644		8,295	7,038	4,189		16,328
Electrical products	2,523	7,153		1,006	5,204	17,374		2,810	4,340	10,618		4,984
Nonmetallic minerals	470	164		60	1,717	348		123	825	274		394
Petroleum and coal products	4,226	254		1,226	9,427		822	105	4,963	760		442
Chemicals and chemical products	1,734	4,268		1,080	5,194	8,501		2,497	3,872	3,831		1,924
Miscellaneous manufacturing industries	1,115	2,627		1,151	3,221	7,957		4,987	3,085	4,031		5,293
Total	92,623	56,037	1,304	23,271	237,528	108,215	22,559	52,855	117,462	79,332	2,568	69,124

Table D-9

Excess[1] Duty Paid, by Region, 1968 and 1970

	1968	1970
	(Millions of dollars)	
Atlantic	2.3	2.0
Quebec	45.2	35.8
Ontario	285.3	295.4
Prairies	24.4	16.9
Pacific	6.6	2.2

1 The difference between estimated duties for imports and the actual figures for each region is totally attributable to transportation equipment, machinery, and the miscellaneous groups.

Table D-10

Effective Price Markup of Tariff as a Proportion of Valued Added, by Industry and Region, 1970

	Atlantic	Quebec	Ontario	Prairies	Pacific
			(Per cent)		
Food and beverages	17.1	21.4	20.8	19.4	23.7
Tobacco products	–	55.5	31.1	–	–
Rubber	–	24.3	25.8	28.4	20.8
Leather	35.5	34.1	32.2	30.8	34.0
Textiles	33.2	26.1	24.9	25.7	23.7
Knitting mills	47.3	41.6	42.4	38.5	43.9
Clothing	28.7	29.4	29.9	28.8	25.6
Wood	9.2	14.1	19.5	21.5	7.5
Furniture and fixtures	27.8	29.4	29.2	30.7	30.2
Paper and allied products	4.1	10.7	15.1	11.8	4.5
Printing and publishing	2.0	1.9	1.9	1.9	2.0
Primary metals	10.3	4.4	11.2	7.8	2.7
Metal fabricating industries	20.3	18.2	18.8	21.0	19.2
Machinery	3.4	4.1	4.1	3.6	3.4
Transportation equipment	12.0	7.8	0.1		12.0
Electrical products	15.7	17.3	20.3	19.9	14.8
Nonmetallic minerals	16.2	14.4	14.5	16.6	15.5
Petroleum and coal products	28.9	29.3	28.5	27.6	27.4
Chemicals and chemical products	5.7	16.9	17.6	8.6	11.8
Miscellaneous manufacturing industries	5.5	5.4	5.5	0.1	5.7

E The Regional Impact of Tariff Removal, 1970

Table E-1

Direct Employment Losses in Manufacturing Industries,[1] Shipments Approach, by Region, 1970

	$e = 1$				
	Atlantic	Quebec	Ontario	Prairies	Pacific
	(Number of jobs)				
Food and beverages	2,243	6,003	8,436	2,837	1,743
Tobacco products	–	–	–	–	–
Rubber	–	1,274	2,864	107	31
Leather	83	3,821	3,129	231	69
Textiles	348	8,365	6,904	349	277
Knitting mills	398	4,210	2,118	94	100
Clothing	155	17,683	6,643	2,363	530
Wood	705	2,288	2,237	916	2,423
Furniture and fixtures	111	3,406	4,297	706	445
Paper and allied products	446	4,284	5,677	517	782
Printing and publishing	484	3,279	5,875	1,487	870
Primary metals	437	1,265	6,512	546	188
Metal fabricating industries	495	5,242	13,520	1,789	1,387
Machinery	59	1,179	4,370	485	319
Transportation equipment	1,406	2,508	4,819	1,147	916
Electrical products	341	4,061	10,851	450	300
Nonmetallic minerals	305	1,846	3,801	798	461
Petroleum and coal products	64	247	274	190	97
Chemicals and chemical products	86	2,130	4,469	303	257
Miscellaneous manufacturing industries	183	3,504	8,287	532	468
Total	8,349	76,595	105,083	15,847	11,663

1 Disaggregation of Table 4-1, incorporating the special arrangements for Auto Pact industries and excluding other industries as discussed in the text.

Table E-2

Direct Employment Losses in Manufacturing Industries,[1] Value-Added Approach, Atlantic Region, 1970

	e = 0.5		e = 1.0		e = 1.5		e = 2.0	
	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Food and beverages	4,173	19.0	4,597	21.0	5,021	22.9	5,445	24.8
Tobacco products	–		–		–		–	
Rubber	–		–		–		–	
Leather	101		111		122		133	
Textiles	477	36.7	522	40.1	567	43.6	612	47.0
Knitting mills	591	51.5	639	55.7	687	59.8	735	64.0
Clothing	168		192		216		240	
Wood	582	10.7	666	12.3	750	13.8	834	15.4
Furniture and fixtures	134	31.7	150	35.5	166	39.3	182	43.1
Paper and allied products	413	4.6	461	5.2	510	5.7	558	6.3
Printing and publishing	51	2.7	64	3.4	73	3.8	86	4.5
Primary metals	430		487		543		600	
Metal fabricating industries	588	23.7	672	27.1	757	30.5	841	33.9
Machinery	19	4.2	22	4.8	26	5.7	29	6.4
Transportation equipment	796	13.8	901	15.6	1,005	17.4	1,109	19.2
Electrical products	295	18.3	338	21.0	381	23.7	423	26.3
Nonmetallic minerals	317	19.5	370	22.7	423	26.0	476	29.2
Petroleum and coal products	150	30.4	158	32.0	165	33.5	173	35.1
Chemicals and chemical products	67	6.6	77	7.5	87	8.5	96	9.4
Miscellaneous manufacturing industries	56	7.0	67	8.4	78	9.8	90	11.3
Total	9,408	15.8	10,494	17.6	11,577	19.4	12,662	21.2

1 Disaggregation of Table 4-2, but including industries 143-153 and excluding the quantity effects of imports from third countries applicable to Auto Pact industries 323-325. See notes to Table 4-2.

Table E-3

Direct Employment Losses in Manufacturing Industries,[1] Value-Added Approach, Quebec, 1970

	$e = 0.5$		$e = 1.0$		$e = 1.5$		$e = 2.0$	
	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Food and beverages	9,035	23.6	9,900	25.9	10,765	28.2	11,630	30.4
Tobacco products	2,794	59.2	2,975	63.0	3,155	66.8	3,336	70.7
Rubber	1,293	28.2	1,469	32.0	1,646	35.9	1,823	39.7
Leather	4,164	34.1	5,193	42.6	5,708	46.8	6,222	51.0
Textiles	8,713	29.2	9,646	32.3	10,578	35.4	11,510	38.5
Knitting mills	5,702	45.1	6,135	48.5	6,569	51.9	7,002	55.3
Clothing	18,434	33.0	20,436	36.5	22,437	40.1	24,439	43.7
Wood	2,694	16.2	3,040	18.3	3,387	20.4	3,734	22.5
Furniture and fixtures	4,631	33.5	5,196	37.6	5,761	41.7	6,325	45.7
Paper and allied products	4,062	12.2	4,570	13.7	5,078	15.3	5,585	16.8
Printing and publishing	332	2.5	410	3.1	488	3.7	566	4.3
Primary metals	872	4.8	961	5.3	1,049	5.8	1,137	6.3
Metal fabricating industries	5,771	21.3	6,620	24.5	7,470	27.6	8,319	30.8
Machinery	388	5.0	460	6.0	533	6.9	605	7.8
Transportation equipment	2,067	9.2	2,378	10.6	2,690	11.9	3,001	13.3
Electrical products	4,017	20.0	4,562	22.7	5,107	25.4	5,652	28.1
Nonmetallic minerals	1,655	17.5	1,943	20.5	2,232	23.6	2,520	26.6
Petroleum and coal products	566	30.8	593	32.2	620	33.7	648	35.2
Chemicals and chemical products	2,306	17.6	2,404	18.4	2,503	19.1	2,601	19.9
Miscellaneous manufacturing industries	1,011	6.7	1,208	8.0	1,404	9.3	1,601	10.6
Total	80,507	21.8	90,099	24.3	99,180	26.8	108,256	29.7

1 See Table E-2.

Table E-4

Direct Employment Losses in Manufacturing Industries,[1] Value-Added Approach, Ontario, 1970

	$e = 0.5$		$e = 1.0$		$e = 1.5$		$e = 2.0$	
	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Food and beverages	12,165	23.1	13,406	25.5	14,648	27.8	15,889	30.2
Tobacco products	1,610	61.6	1,664	63.7	1,718	65.8	1,772	67.8
Rubber	3,238	29.6	3,659	33.4	4,080	37.3	4,501	41.1
Leather	3,885	36.0	4,294	39.8	4,703	43.5	5,113	47.3
Textiles	6,724	28.2	7,508	31.5	8,292	34.8	9,076	38.1
Knitting mills	2,884	46.3	3,129	50.3	3,374	54.2	3,618	58.1
Clothing	7,012	33.9	7,851	38.0	8,689	42.1	9,528	46.1
Wood	3,081	22.3	3,474	25.2	3,866	28.0	4,258	30.9
Furniture and fixtures	5,343	33.2	6,002	37.3	6,661	41.5	7,320	45.6
Paper and allied products	5,821	17.2	6,531	19.3	7,241	21.4	7,951	23.5
Printing and publishing	646	2.6	802	3.2	958	3.8	1,114	4.4
Primary metals	7,174	12.7	8,066	14.3	8,958	15.9	9,850	17.5
Metal fabricating industries	13,495	22.3	15,440	25.5	17,386	28.7	19,331	31.9
Machinery	1,653	5.0	1,950	5.9	2,247	6.8	2,544	7.7
Transportation equipment	64	0.1	73	0.1	81	0.1	90	0.1
Electrical products	11,713	23.3	13,197	26.2	14,682	29.2	16,166	32.1
Nonmetallic minerals	3,282	17.4	3,835	20.3	4,387	23.3	4,940	26.2
Petroleum and coal products	628	29.9	657	31.2	685	32.6	714	34.0
Chemicals and chemical products	4,576	20.7	5,263	23.8	5,951	26.9	6,638	30.0
Miscellaneous manufacturing industries	2,390	6.8	2,860	8.1	3,329	9.5	3,799	10.8
Total	97,384	17.3	109,661	19.5	121,936	21.7	134,212	23.8

1 See Table E-2.

Table E-5

Direct Employment Losses in Manufacturing Industries,[1] Value-Added Approach, Prairies, 1970

	e = 0.5		e = 1.0		e = 1.5		e = 2.0	
	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Food and beverages	4,145	21.1	4,464	22.7	4,783	24.3	5,101	25.9
Tobacco products	–		–		–		–	
Rubber	135	31.8	149	35.0	162	38.1	176	41.4
Leather	278	34.0	304	37.2	331	40.5	357	43.6
Textiles	333	28.9	370	32.1	407	35.4	445	38.7
Knitting mills	130	41.1	137	43.3	145	45.9	153	48.4
Clothing	2,465	32.3	2,735	35.8	3,005	39.4	3,274	42.9
Wood	1,415	24.2	1,572	26.9	1,730	29.6	1,887	32.3
Furniture and fixtures	884	34.5	983	38.4	1,081	42.2	1,180	46.1
Paper and allied products	406	13.5	459	15.3	512	17.1	565	18.8
Printing and publishing	153	2.6	191	3.2	230	3.9	268	4.6
Primary metals	461	8.8	516	9.9	571	10.9	626	12.0
Metal fabricating industries	2,040	24.5	2,331	28.0	2,622	31.5	2,913	35.0
Machinery	139	4.3	162	5.0	185	5.7	208	6.4
Transportation equipment	-389	7.0	-476	8.5	-562	10.0	-649	11.6
Electrical products	428	22.5	478	25.2	529	27.8	579	30.5
Nonmetallic minerals	807	20.2	950	23.8	1,093	27.4	1,236	30.9
Petroleum and coal products	446	29.4	474	31.3	502	33.1	530	35.0
Chemicals and chemical products	230	10.2	267	11.9	304	13.5	342	15.2
Miscellaneous manufacturing industries	168	7.3	202	8.7	236	10.2	270	11.7
Total	14,674	18.0	16,268	19.9	17,866	21.9	19,461	23.8

1 See Table E-2.

Table E-6

Direct Employment Losses in Manufacturing Industries, [1] Value-Added Approach, Pacific Region, 1970

	$e = 0.5$		$e = 1.0$		$e = 1.5$		$e = 2.0$	
	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Food and beverages	2,905	26.2	3,186	28.7	3,468	31.3	3,749	33.8
Tobacco products	–		–		–		–	
Rubber	28	24.3	32	27.8	36	31.3	40	34.8
Leather	84	38.3	94	42.9	104	47.5	114	52.0
Textiles	239	26.7	267	29.9	294	32.9	321	35.9
Knitting mills	153		167		181		196	
Clothing	562	29.2	631	32.8	701	36.4	771	40.0
Wood	2,839	8.4	3,160	9.4	3,480	10.4	3,800	11.3
Furniture and fixtures	561	34.5	630	38.8	700	43.1	769	47.3
Paper and allied products	633	5.2	722	5.9	810	6.6	899	7.3
Printing and publishing	90	2.6	112	3.3	135	3.9	157	4.6
Primary metals	174	3.0	195	3.4	215	3.7	236	4.1
Metal fabricating industries	1,568	22.6	1,803	26.0	2,038	29.4	2,273	32.8
Machinery	102	4.2	122	5.0	141	5.8	160	6.6
Transportation equipment	573	13.9	650	15.8	727	17.6	804	19.5
Electrical products	253	17.1	287	19.4	321	21.7	356	24.0
Nonmetallic minerals	465	18.6	542	21.7	620	24.8	697	27.9
Petroleum and coal products	211	28.7	220	29.9	230	31.2	239	32.5
Chemicals and chemical products	222	13.6	253	15.5	283	17.4	313	19.2
Miscellaneous manufacturing industries	149		179		210		241	
Total	11,811	12.7	13,252	14.2	14,694	15.8	16,135	17.3

1 See Table E-2.

Table E-7

Direct Employment Losses with Devaluation,[1] Shipments Approach,[2] by Region, 1970

	Atlantic	Quebec	Ontario	Prairies	Pacific
			(Number of jobs)		
Food and beverages	51	+376	+471	+580	+19
Tobacco products	–	–	–	–	–
Rubber	–	569	1,292	49	14
Leather	48	2,157	1,408	87	38
Textiles	210	4,956	4,022	200	153
Knitting mills	243	2,551	1,276	56	61
Clothing	90	10,232	3,844	1,367	306
Wood	+42	240	411	161	79
Furniture and fixtures	47	1,718	1,956	323	204
Paper and allied products	144	1,513	2,099	169	249
Printing and publishing	191	1,292	2,492	588	344
Primary metals	38	+53	+590	19	11
Metal fabricating industries	162	1,910	4,777	607	464
Machinery	20	278	1,040	134	72
Transportation equipment	540	907	1,288	794	312
Electrical products	128	1,671	4,335	202	110
Nonmetallic minerals	–	263	739	4	49
Petroleum and coal products	+22	+82	+92	+64	+32
Chemicals and chemical products	33	745	1,230	63	65
Miscellaneous manufacturing industries	81	1,554	3,556	210	214
Total	1,962	32,045	34,612	4,389	2,694

1 $e = 1.0; d = 0.10$. Excluding the impact of induced exports.

2 Disaggregation of Table 4-3, incorporating the special arrangements for Auto Pact industries and excluding other industries as discussed in the text.

Table E-8

Direct Employment Losses with Devaluation,[1] Value-Added Approach,[2] Atlantic Region, 1970

	e = 0.5		e = 1.0		e =1.5		e = 2.0	
	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Food and beverages	2,989	13.6	3,335	15.2	3,681	16.8	4,027	18.4
Tobacco products	–		–		–		–	
Rubber	–		–		–		–	
Leather	84		95		105		115	
Textiles	406	31.2	450	34.6	493	37.9	537	41.3
Knitting mills	517	45.1	566	49.3	615	53.5	663	57.8
Clothing	134		156		177		199	
Wood	394	7.3	454	8.4	515	9.5	576	10.6
Furniture and fixtures	103	24.4	117	27.8	132	31.2	146	34.6
Paper and allied products	266	3.0	302	3.4	338	3.8	374	4.2
Printing and publishing	–		–		–		–	
Primary metals	152		175		199		222	
Metal fabricating industries	383	15.4	446	18.0	509	20.5	572	23.1
Machinery	1	0.2	1	0.2	1	0.2	2	0.4
Transportation equipment	380	6.6	436	7.6	493	8.6	549	9.5
Electrical products	186	11.6	217	13.5	248	15.4	279	17.4
Nonmetallic minerals	163	10.0	194	11.9	225	13.8	256	15.8
Petroleum and coal products	116	23.6	123	25.0	130	26.3	137	27.7
Chemicals and chemical products	30	3.0	36	3.5	41	4.0	46	4.5
Miscellaneous manufacturing industries	–		–		–		–	
Total	6,304	10.6	7,103	11.9	7,902	13.3	8,700	14.6

1 d = 0.10. Excluding the impact of induced exports.

2 Disaggregation of Table 4-3, including other industries and excluding the quantity effects of imports from third countries applicable to Auto Pact industries.

Table E-9

Direct Employment Losses with Devaluation,[1] Value-Added Approach,[2] Quebec, 1970

	$e = 0.5$		$e = 1.0$		$e = 1.5$		$e = 2.0$	
	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent	(Number of jobs)	(Per cent)
Food and beverages	6,576	17.2	7,291	19.1	8,005	20.9	8,719	22.8
Tobacco products	2,492	52.8	2,683	56.9	2,874	60.9	3,065	65.0
Rubber	951	20.7	1,100	24.0	1,249	27.2	1,397	30.5
Leather	3,908	32.0	4,396	36.0	4,884	40.0	5,371	44.0
Textiles	6,806	22.8	7,628	25.6	8,449	28.3	9,271	31.1
Knitting mills	5,000	39.5	5,431	42.9	5,862	46.3	6,292	49.7
Clothing	14,952	26.7	17,139	30.7	19,326	34.6	21,513	38.5
Wood	2,128	12.8	2,423	14.6	2,718	16.4	3,014	18.1
Furniture and fixtures	3,674	26.6	4,184	30.3	4,693	33.9	5,203	37.6
Paper and allied products	2,647	8.0	3,028	9.1	3,409	10.2	3,790	11.4
Printing and publishing	–		–		–		–	
Primary metals	405	2.3	453	2.5	499	2.8	546	3.0
Metal fabricating industries	3,513	13.0	4,107	15.2	4,702	17.4	5,296	19.6
Machinery	28	0.4	34	0.4	40	0.5	46	0.6
Transportation equipment	436	1.9	511	2.3	587	2.6	663	2.9
Electrical products	2,655	13.2	3,068	15.3	3,482	17.3	3,896	19.4
Nonmetallic minerals	821	8.7	986	10.4	1,150	12.2	1,315	13.9
Petroleum and coal products	438	23.8	462	25.1	486	26.4	511	27.8
Chemicals and chemical products	1,584	12.1	1,661	12.7	1,738	13.3	1,816	13.9
Miscellaneous manufacturing industries	–		–		–		–	
Total	59,014	16.0	66,585	18.0	74,135	20.1	81,724	22.1

1 $d = 0.10$. Excluding the impact of induced exports.

2 Disaggregation of Table 4-3, including other industries and excluding the quantity effects of imports from third countries applicable to Auto Pact industries.

Table E-10

Direct Employment Losses with Devaluation,[1] Value-Added Approach,[2] Ontario, 1970

	$e = 0.5$		$e = 1.0$		$e = 1.5$		$e = 2.0$	
	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Food and beverages	8,775	16.7	9,790	18.6	10,806	20.5	11,821	22.5
Tobacco products	942	36.1	1,007	38.6	1,072	41.0	1,137	43.5
Rubber	2,440	22.3	2,803	25.6	3,165	28.9	3,527	32.3
Leather	3,199	29.6	3,583	33.2	3,967	36.7	4,350	40.3
Textiles	5,215	21.9	5,898	24.7	6,581	27.6	7,264	30.5
Knitting mills	2,532	40.7	2,775	44.6	3,018	48.5	3,261	52.4
Clothing	5,553	26.9	6,309	30.5	7,066	34.2	7,822	37.9
Wood	2,367	17.2	2,702	19.6	3,036	22.0	3,371	24.5
Furniture and fixtures	4,225	26.3	4,819	30.0	5,413	33.7	6,006	37.4
Paper and allied products	4,042	12.0	4,609	13.6	5,175	15.3	5,741	17.0
Printing and publishing	–		–		–		–	
Primary metals	3,125	5.6	3,576	6.4	4,027	7.2	4,478	8.0
Metal fabricating industries	8,333	13.6	9,713	15.8	11,093	18.1	12,473	20.3
Machinery	228	0.7	273	0.8	318	1.0	363	1.1
Transportation equipment	-465	− 0.7	-530	− 0.8	-596	−0.9	-661	−1.0
Electrical products	8,125	16.2	9,307	18.5	10,489	20.9	11,671	23.2
Nonmetallic minerals	1,588	8.4	1,896	10.1	2,203	11.7	2,511	13.3
Petroleum and coal products	486	23.1	511	24.3	537	25.5	562	26.8
Chemicals and chemical products	2,813	12.7	3,296	14.9	3,780	17.1	4,263	19.3
Miscellaneous manufacturing industries	–		–		–		–	
Total	63,523	11.3	72,337	12.9	81,150	14.4	89,960	16.0

1 $d = 0.10$. Excluding the impact of induced exports.

2 Disaggregation of Table 4-3, including other industries and excluding the quantity effects of imports from third countries applicable to Auto Pact industries.

Table E-11

Direct Employment Losses with Devaluation,[1] Value-Added Approach,[2] Prairies, 1970

	$e = 0.5$		$e = 1.0$		$e = 1.5$		$e = 2.0$	
	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Food and beverages	2,835	14.4	3,083	15.7	3,331	16.9	3,578	18.2
Tobacco products	–		–		–		–	
Rubber	105	24.8	118	27.7	130	30.6	143	33.6
Leather	224	27.4	248	30.4	273	33.3	297	36.3
Textiles	287	24.9	322	28.0	357	31.0	391	34.0
Knitting mills	115	36.5	123	39.0	131	41.5	139	44.0
Clothing	1,949	25.6	2,192	28.7	2,436	31.9	2,679	35.1
Wood	1,127	19.3	1,267	21.7	1,406	24.1	1,545	26.5
Furniture and fixtures	702	27.5	792	30.9	881	34.4	970	37.9
Paper and allied products	276	9.2	317	10.6	359	12.0	400	13.3
Printing and publishing	–		–		–		–	
Primary metals	184	3.5	209	4.0	234	4.5	260	5.0
Metal fabricating industries	1,324	15.9	1,540	18.5	1,757	21.1	1,974	23.7
Machinery	4	0.1	5	0.1	5	0.2	6	0.2
Transportation equipment	−193	−3.4	−229	−4.1	−266	−4.8	−302	−5.4
Electrical products	281	14.8	319	16.8	357	18.8	395	20.8
Nonmetallic minerals	422	10.6	508	12.7	594	14.9	680	17.0
Petroleum and coal products	346	22.8	371	24.5	396	26.1	421	27.8
Chemicals and chemical products	109	4.9	128	5.7	148	6.6	168	7.5
Miscellaneous manufacturing industries	–		–		–		–	
Total	10,097	12.4	11,313	13.9	12,529	15.4	13,744	16.8

1 $d = 0.10$. Excluding the impact of induced exports.

2 Disaggregation of Table 4-3, including other industries and excluding the quantity effects of imports from third countries applicable to Auto Pact industries.

Table E-12

Direct Employment Losses with Devaluation,[1] Value-Added Approach,[2] Pacific Region, 1970

	$e = 0.5$		$e = 1.0$		$e = 1.5$		$e = 2.0$	
	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment	Employment losses	Proportion of local industry employment
	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)	(Number of jobs)	(Per cent)
Food and beverages	2,215	20.0	2,458	22.2	2,701	24.4	2,944	26.5
Tobacco products	–		–		–		–	
Rubber	18	15.6	21	18.1	24	20.7	27	23.2
Leather	70	31.8	79	36.1	88	40.1	97	44.3
Textiles	183	20.5	206	23.0	230	25.7	253	28.3
Knitting mills	138		153		167		182	
Clothing	445	23.1	508	26.4	571	29.6	634	32.9
Wood	2,153	6.4	2,416	7.2	2,680	8.0	2,944	8.8
Furniture and fixtures	444	27.3	507	31.2	570	35.1	632	38.9
Paper and allied products	396	3.2	460	3.8	523	4.3	587	4.8
Printing and publishing	–		–		–		–	
Primary metals	94	1.6	105	1.8	115	2.0	126	2.2
Metal fabricating industries	987	14.2	1,156	16.7	1,326	19.1	1,496	21.6
Machinery	5	0.2	6	0.2	7	0.3	8	0.3
Transportation equipment	246	6.0	284	6.9	322	7.8	360	8.7
Electrical products	156	10.5	180	12.1	204	13.8	228	15.4
Nonmetallic minerals	246	9.9	293	11.7	340	13.6	387	15.5
Petroleum and coal products	163	22.2	171	23.3	180	24.4	188	25.6
Chemicals and chemical products	161	9.9	185	11.4	209	12.8	232	14.3
Miscellaneous manufacturing industries	–		–		–		–	
Total	8,120	8.7	9,188	9.9	10,257	11.0	11,325	12.2

1 $d = 0.10$. Excluding the impact of induced exports.

2 Disaggregation of Table 4-3, including other industries and excluding the quantity effects of imports from third countries applicable to Auto Pact industries.

Table E-13

Job Loss Offsets from Devaluation-Induced Increases in Exports,[1] Shipments Approach,[2] by Region, S_X = 1, 1970

	Atlantic	Quebec	Ontario	Prairies	Pacific
			(Number of jobs)		
Food and beverages	1,439	704	581	244	207
Tobacco products	–	–	–	–	–
Rubber	–	71	148	5	–
Leather	1	125	167	10	1
Textiles	43	389	293	15	7
Knitting mills	3	86	17	11	6
Clothing	8	578	145	111	70
Wood	312	1,128	596	265	4,849
Furniture and fixtures	3	152	187	9	8
Paper and allied products	1,597	4,109	3,032	304	2,106
Printing and publishing	3	92	91	19	8
Primary metals	283	2,816	4,509	558	1,075
Metal fabricating industries	28	458	778	34	90
Machinery	43	605	3,236	262	271
Transportation equipment	85	1,298	1,209	145	41
Electrical products	101	1,179	1,696	37	99
Nonmetallic minerals	6	237	361	6	49
Petroleum and coal products	4	10	22	26	7
Chemicals and chemical products	131	605	684	209	122
Miscellaneous manufacturing industries	30	607	1,274	49	62
Total	4,120	15,249	19,026	2,319	9,078

1 e = 1.0.

2 Disaggregation of Table 4-4, incorporating the special arrangements for Auto Pact industries and excluding other industries as discussed in the text.

Table E-14

Job Loss Offsets from Devaluation-Induced Increases in Exports,[1] Shipments Approach,[2] by Region, $S_X = 2$, 1970

	Atlantic	Quebec	Ontario	Prairies	Pacific
			(Number of jobs)		
Food and beverages	2,116	1,057	871	360	301
Tobacco products	–	–	–	–	–
Rubber	–	109	226	6	1
Leather	1	191	255	15	2
Textiles	60	580	447	22	10
Knitting mills	4	130	25	16	9
Clothing	12	879	221	169	106
Wood	456	1,615	859	375	7,078
Furniture and fixtures	5	232	280	14	12
Paper and allied products	2,391	5,914	4,338	452	3,151
Printing and publishing	4	139	139	28	12
Primary metals	395	4,134	6,825	841	1,622
Metal fabricating industries	43	681	1,185	52	137
Machinery	63	859	4,598	381	377
Transportation equipment	121	1,830	1,328	166	54
Electrical products	142	1,653	2,475	56	141
Nonmetallic minerals	10	343	532	9	70
Petroleum and coal products	6	15	33	40	10
Chemicals and chemical products	197	885	947	304	176
Miscellaneous manufacturing industries	43	880	1,858	74	87
Total	6,069	22,126	27,442	3,380	13,356

1 $e = 1.0$.

2 Disaggregation of Table 4-4, incorporating the special arrangements for Auto Pact industries and excluding other industries as discussed in the text.

Table E-15

Direct and Indirect Effects on Employment, Shipments Approach with Devaluation,[1] Atlantic Region, 1970

	$S_X = 1$			$S_X = 2$		
	Direct and indirect effects	– Direct effects	= Indirect effects	Direct and indirect effects	– Direct effects	= Indirect effects
Food and beverages	1,679	1,388	291	2,632	2,065	567
Tobacco products	–	–	–	–	–	–
Rubber	–	–	–	–	–	–
Leather	−51	−47	−4	−46	−47	1
Textiles	−263	−167	−96	−229	−150	−79
Knitting mills	−291	−240	−51	−270	−239	−31
Clothing	−71	−82	11	−57	−78	21
Wood	477	354	123	686	498	188
Furniture and fixtures	−40	−44	4	−33	−42	9
Paper and allied products	1,514	1,453	61	2,405	2,247	158
Printing and publishing	−146	−188	42	−113	−187	74
Primary metals	244	245	−1	406	357	49
Metal fabricating industries	−114	−134	20	−74	−119	45
Machinery	28	23	5	52	43	9
Transportation equipment	−455	−455	0	−390	−419	29
Electrical products	−27	−27	0	27	14	13
Nonmetallic minerals	18	6	12	30	10	20
Petroleum and coal products	39	26	13	50	28	22
Chemicals and chemical products	127	98	29	215	164	51
Miscellaneous manufacturing industries	−46	−51	5	−20	−38	18
Total manufacturing	2,622	2,158	464	5,271	4,107	1,164
Total primary industries	1,472	–	1,472	2,394	–	2,394
Total tertiary industries	2,153	–	2,153	3,691	–	3,691
Total	6,247	2,158	4,089	11,356	4,107	7,249

1 Disaggregation of Table 4-11.

Table E-16

Direct and Indirect Effects on Employment, Shipments Approach with Devaluation,[1] Quebec, 1970

	$S_X = 1$			$S_X = 2$		
	Direct and indirect effects	– Direct effects	= Indirect effects	Direct and indirect effects	– Direct effects	= Indirect effects
Food and beverages	1,090	1,080	10	2,070	1,433	637
Tobacco products	3	–	3	58	–	58
Rubber	-604	-498	-106	-488	-460	-28
Leather	-2,625	-2,032	-593	-2,355	-1,966	-389
Textiles	-8,440	-4,567	-3,873	-7,697	-4,376	-3,321
Knitting mills	-3,043	-2,465	-578	-2,839	-2,421	-418
Clothing	-10,550	-9,654	-896	-9,447	-9,353	-94
Wood	917	888	29	1,679	1,375	304
Furniture and fixtures	-1,638	-1,566	-72	-1,419	-1,486	67
Paper and allied products	2,466	2,596	-130	4,866	4,401	465
Printing and publishing	-1,321	-1,200	-121	-1,059	-1,153	94
Primary metals	3,826	2,869	957	5,893	4,187	1,706
Metal fabricating industries	-1,548	-1,452	-96	-934	-1,229	295
Machinery	343	327	16	662	581	81
Transportation equipment	403	391	12	1,043	923	120
Electrical products	-582	-492	-90	101	-18	119
Nonmetallic minerals	23	-26	49	258	80	178
Petroleum and coal products	98	92	6	144	97	47
Chemicals and chemical products	-298	-140	-158	265	140	125
Miscellaneous manufacturing industries	-1,176	-947	-229	-685	-674	-11
Total manufacturing	-22,656	-16,796	-5,860	-9,884	-9,919	35
Total primary industries	3,327	–	3,327	6,663	–	6,663
Total tertiary industries	-3,106	–	-3,106	4,942	–	4,942
Total	-22,435	-16,796	-5,639	1,721	-9,919	11,640

1 See Table E-15.

Table E-17

Direct and Indirect Effects on Employment, Shipments Approach with Devaluation,[1] Ontario, 1970

	$S_X = 1$			$S_X = 2$		
	Direct and indirect effects	– Direct effects	= Indirect effects	Direct and indirect effects	– Direct effects	= Indirect effects
Food and beverages	1,005	1,052	-47	2,096	1,342	754
Tobacco products	-6	–	-6	16	–	16
Rubber	-1,321	-1,144	-177	-976	-1,066	90
Leather	-1,610	-1,241	-369	-1,347	-1,153	-194
Textiles	-5,921	-3,729	-2,192	-5,420	-3,575	-1,845
Knitting mills	-1,638	-1,259	-379	-1,474	-1,251	-223
Clothing	-3,961	-3,699	-262	-3,548	-3,623	75
Wood	54	185	-131	515	448	67
Furniture and fixtures	-1,886	-1,769	-117	-1,608	-1,676	68
Paper and allied products	607	933	-326	2,515	2,239	276
Printing and publishing	-2,647	-2,401	-246	-2,215	-2,353	138
Primary metals	5,682	5,099	583	9,373	7,415	1,958
Metal fabricating industries	-4,424	-3,999	-425	-3,187	-3,592	405
Machinery	2,278	2,196	82	3,926	3,558	368
Transportation equipment	-110	-79	-31	455	40	415
Electrical products	-2,992	-2,639	-353	-1,574	-1,860	286
Nonmetallic minerals	-387	-378	-9	7	-207	214
Petroleum and coal products	108	114	-6	158	125	33
Chemicals and chemical products	-880	-546	-334	-134	-283	149
Miscellaneous manufacturing industries	-2,581	-2,282	-299	-1,603	-1,698	95
Total manufacturing	-20,630	-15,586	-5,044	-4,025	-7,170	3,145
Total primary industries	2,212	–	-2,212	4,686	–	4,686
Total tertiary industries	-4,382	–	-4,382	4,171	–	4,171
Total	-22,800	-15,586	-7,214	4,832	-7,170	12,002

1 See Table E-15.

Table E-18

Direct and Indirect Effects on Employment, Shipments Approach with Devaluation,[1] Prairies, 1970

	$S_X = 1$			$S_X = 2$		
	Direct and indirect effects	– Direct effects	= Indirect effects	Direct and indirect effects	– Direct effects	= Indirect effects
Food and beverages	1,022	824	198	1,342	940	402
Tobacco products	–	–	–	–	–	–
Rubber	-44	-44	0	-36	-43	7
Leather	-88	-77	-11	-74	-72	-2
Textiles	-230	-185	-45	-211	-178	-33
Knitting mills	-47	-45	-2	-39	-40	1
Clothing	-1,304	-1,256	-48	-1,160	-1,198	38
Wood	147	104	43	307	214	93
Furniture and fixtures	-308	-314	6	-289	-309	20
Paper and allied products	160	135	25	346	283	63
Printing and publishing	-540	-569	29	-486	-560	74
Primary metals	567	539	28	908	822	86
Metal fabricating industries	-565	-573	8	-501	-555	54
Machinery	137	128	9	267	247	20
Transportation equipment	-644	-649	5	-626	-628	2
Electrical products	-163	-165	2	-133	-146	13
Nonmetallic minerals	20	2	18	40	5	35
Petroleum and coal products	106	90	16	131	104	27
Chemicals and chemical products	156	146	10	291	241	50
Miscellaneous manufacturing industries	-155	-161	6	-116	-136	20
Total manufacturing	-1,773	-2,070	297	-39	-1,009	970
Total primary industries	2,706	–	2,706	3,952	–	3,952
Total tertiary industries	1,339	–	1,339	2,579	–	2,579
Total	2,272	-2,070	4,342	6,492	-1,009	7,501

1 See Table E-15.

Table E-19

Direct and Indirect Effects on Employment, Shipments Approach with Devaluation,[1] Pacific Region, 1970

	$S_X = 1$			$S_X = 2$		
	Direct and indirect effects	– Direct effects	= Indirect effects	Direct and indirect effects	– Direct effects	= Indirect effects
Food and beverages	537	226	311	849	320	529
Tobacco products	–	–	–	–	–	–
Rubber	−10	−14	4	−7	−13	6
Leather	−23	−37	14	−13	−36	23
Textiles	−141	−146	5	−120	−143	23
Knitting mills	−67	−55	−12	−58	−52	−6
Clothing	−200	−236	36	−128	−200	−72
Wood	5,468	4,770	698	8,172	6,999	1,173
Furniture and fixtures	−124	−196	72	−73	−192	119
Paper and allied products	1,980	1,857	123	3,166	2,902	264
Printing and publishing	−198	−336	138	−105	−332	227
Primary metals	1,159	1,064	95	1,801	1,611	190
Metal fabricating industries	−272	−374	102	−131	−327	196
Machinery	224	199	25	349	305	44
Transportation equipment	−235	−271	36	−196	−258	62
Electrical products	1	−11	12	57	31	26
Nonmetallic minerals	27	–	27	74	21	53
Petroleum and coal products	73	39	34	96	42	54
Chemicals and chemical products	147	57	90	263	111	152
Miscellaneous manufacturing industries	−106	−152	46	−49	−127	78
Total manufacturing	8,240	6,384	1,856	13,947	10,662	3,285
Total primary industries	3,262	–	3,262	5,003	–	5,003
Total tertiary industries	4,934	–	4,934	7,950	–	7,950
Total	16,436	6,384	10,052	26,900	10,662	16,238

1 See Table E-15.

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Hugh McA Pinchin

Born in London, England in 1939, Hugh Pinchin studied economics at the University of British Columbia and at Yale University, earning his Ph.D. in 1970. He served for a brief period with the Department of Regional Economic Expansion in Ottawa and now teaches at Colgate University in Hamilton, New York.

Summary

By contrasting the existing patterns of regional income and employment with those derived for specific counterfactual situations, this study attempts to isolate the impact of the current system of tariffs on the five principal regions of the country. The analytical procedure involves the use of nominal and effective tariff rates, an interregional input-output table, and a review of regional trading strengths in conjunction with various assumptions concerning elasticities and exchange rate changes.

The quantitative conclusions support some widely held beliefs, namely: that the tariff reduces real incomes and employment in the Pacific and the Atlantic regions, and that it involves large annual transfers from consumers throughout the country to support manufacturing interests, largely in Quebec and Ontario. On the other hand the study also shows that Quebec has been emerging as the most tariff-dependent region with considerably less potential than Ontario to adapt efficiently to changing circumstances. Consequently it concludes that future changes in Federal tariff policy should be co-ordinated with regional development policies and should be shaped by the realization that the principal manufacturing centres of Quebec, and to a lesser extent the Prairies, are likely to experience the greatest problems of adaptation.