

Structural Change and Industrial Policy
The Redeployment of Canadian Manufacturing, 1960-80



Roy A. Matthews



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of Canada



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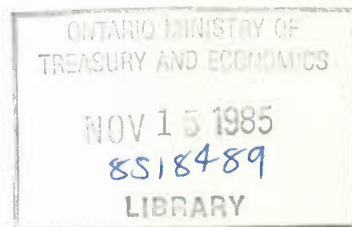
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WITH THE COLLABORATION OF
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Preface

This study, the expansion of an earlier contribution to the Economic Council's project on technology, trade, and income growth, adds its findings to the long-standing discussion about the structure and relative competitiveness of Canadian manufacturing industry. In so doing, it also seeks to offer some useful input to the controversy over whether Canada needs an "industrial policy" – a comprehensive economic development plan drawn up at the initiative of government – which could become especially lively in the context of a new examination of the merits of Canada-U.S. free trade.

Because that question is receiving much attention these days from people outside the economics profession, the material presented here is organized and written in a fashion that should be readily understood by the general reader. In particular, the opening chapters are designed to provide a summary of the relevant current theory, essentially for the non-specialist, as an introduction to the somewhat more technical chapters that come later.

Although the text of the document is entirely by Matthews, certain sections (notably in Chapters 5 and 8) utilize concepts and methodology originated by McCulla in analysis carried out at the Department of Regional Industrial Expansion. However, neither McCulla nor his department were involved in any way in the main body of research and they should not be implicated in its conclusions, which are wholly Matthews' responsibility.

Acknowledgment is due to Neil Swan of the Council staff for his help and encouragement, as well as to Ken Norrie and some anonymous referees for valuable criticisms.

* * *

It should be noted that the cut-off point of this study, shown in the title as 1980, is in fact a little less precise than that: some data are shown for 1981 and reference is made to later events. However, the analysis is not carried beyond the very early 1980s for two reasons. Of these the more important is that the world-wide economic slowdown commencing at that time might tend to produce short-range cyclical effects obscuring the longer-term trends that are the paper's essential concern. The other reason has to do with the extremely erratic behaviour of exchange rates after about 1981, which would render excessively artificial subsequent efforts at the sorts of comparisons of costs, etc., attempted in Chapter 5.

1 Introduction

For years now, various political commentators and some organized groups – including at least one political party (the New Democratic Party) – have been urging the adoption by government of an “industrial policy” or “industrial strategy,” which is seen as being a kind of blueprint for the future of Canadian production activity. Such advocacy stems, apparently, from the belief that normal profit-maximizing approaches by private firms cannot in themselves guarantee – at any rate for a country like Canada – the concentration of manufacturing capability in fields that will yield the highest economic returns. If we rely on the private sector alone to decide these things, it is suggested, other economies directed according to a clearly articulated industrial plan will inevitably gain a competitive edge over Canadian firms, both in international markets and, to a considerable extent, even in the home market also.

A variant on this theme is that the private enterprise system would, left to itself, move Canadian human and material resources into the most appropriate pursuits, but that the social costs of adjusting from existing patterns of endeavour to new ones are in some cases so great that a democratic nation will never allow the change to occur. According to this version of the argument, an industrial policy is required in order to manage the process of adjustment in a manner that minimizes upheavals and disruptions, thus rendering it socially and politically acceptable.

To date no positive evidence has appeared indicating that an industrial policy of the type envisioned – a coherent overall scheme worked out in detail and accepted by the major interest groups involved – is going to be developed by the present government, any more than it was by the previous one. However, very great attention has been given to the idea, which by now unquestionably has acquired political momentum. It is likely to receive a fresh impetus from the close official support now being given in Ottawa to the concept of some species of free trade arrangement with the United States. Serious independent analysis of the case for an industrial policy is thus evidently to be encouraged.

While the term came into currency fairly recently, one can say that Canada has long had an industrial policy of sorts, expressed through the import tariff and

other devices affecting production and trading conditions. And it is equally obvious that these arrangements are being augmented, today, by a host of incentives and encouragements to activities deemed desirable, be they high technology, research and development, export promotion, etc., and by obstacles against foreign encroachments into Canadian industries’ domestic sphere through various restraints, such as possible limits on investment by non-residents, quotas and special duties on imports, and so on. Thus, the traditional industrial policy that grew out of the old “National Policy” and was elaborated in rather piecemeal fashion over the last century has taken on at least some of the characteristics of the strategy modern “dirigistes” are looking for: protection continues to obviate the necessity for painful adjustments in really vulnerable industries, while positive inducements to expansion are provided to the types of firms widely believed to bring above-average rewards to the economy that possesses them.

A number of aspects of this situation are disturbing. First of all, it seems to have emerged from no body of legitimate theory, being rather a pragmatic and indeed somewhat confused response to all manner of political pressures, bureaucratic preferences, and intriguing but far from fully comprehended new conceptions about the functioning of contemporary economic forces. While the transfers of public funds and manipulation of private resources that are entailed may be justified if the results are satisfactory, no one can say at this point that they may not generate very great inefficiencies and waste. Given the complexity of the economic machine, it probably is impossible to show with any certainty which of these is the more likely, but even so it would be helpful to have some perception of the potential for good or ill.

A second problem is that the policy is by its nature something of a grab-bag of individual elements, which has never been presented *in toto* to the electorate or indeed even to Parliament. Its relationships to the important political goals of the country have therefore not been debated in any meaningful way. In truth, that feature of the essentially *ad hoc* construction that is industrial policy in Canada differs sharply from what has been sought by most of the people who have pushed for a deliberately enunciated strategy: it is too much of a mish-mash to provide an effective plan of action. Neither complete *laissez-faire* nor explicitly

directed development, it perhaps leaves both business and the public somewhat perplexed as to the government's view of its functions and purposes in Canadian economic life.

A third possible drawback to the situation relates to its impacts on other countries. Because much of industrial policy is designed to produce an improvement in the competitive position of the nation concerned vis-à-vis others, there are many implications for trading partners and for the world trading environment in general.¹ As a signatory to the GATT and a country very dependent on foreign trade, Canada has reason to avoid behaviour that might seem to undermine in any respect the principles of the international trading system. While this point could certainly be contradicted, it is arguable that other nations would be more ready to understand and accept an industrial policy firmly linked to avowed Canadian economic and social objectives, but with due concern for the interests of the world community as a whole, than one that had been put together for a mixture of largely unacknowledged domestic reasons and with no explicit reference to international commitments.

The functions of the Economic Council as a consultative organization, established by government but responding to a broadly based private-sector constituency and putting its reports and studies into the public domain, suggest that it is a very suitable forum for the discussion of Canadian industrial policy. The following study started out as a supporting paper for the Council's report *The Bottom Line*,² providing background for one of the chapters. Like all material written by staff members, the document does not necessarily represent the views of the Council. It is published as a constructive contribution to discussion, focusing especially but not exclusively on the aspects that impinge most importantly on the position of Canada as a trading nation and an entity peculiarly sensitive to continental and international relationships.

What the study tries to do is fairly modest: merely to place the argument for an industrial policy in some sort of analytical perspective, examining the significant economic determinants through standard techniques. It endeavours to organize its approach in a fashion that deals with the relevant points one by one and draws conclusions as it goes along. But it does not set out to answer the ultimate question of whether an industrial policy is necessary or desirable for Canada in the 1980s.

First of all, the paper looks very briefly at the historical justification for fostering manufacturing industry, both as a general proposition and specifically in Canada. It refers to the problems that can arise from a policy of import protection – notably the “scale-and-specialization” syndrome that is a familiar topic to

economists and businessmen in this country – and seeks to determine what has happened to Canadian manufacturing as protection has been reduced in the past twenty years or so of international trade liberalization. This section of the study addresses itself to the idea that Canada may be in the throes of “deindustrialization,” as some observers have alleged, consequent on the changes in trade and other developments, so that an industrial policy could be needed simply to keep in being the productive capacity and employment laboriously built up over many decades.

Exploration of that notion requires an assessment of the relative competitiveness of Canadian secondary industry – its ability to match the cost and price performance of other sectors in foreign markets and vis-à-vis imports in the home market. Attention then shifts to an evaluation of the structural changes that have occurred within the sector as a whole, the latter portion of the relevant chapter dwelling on the fortunes of high-technology industries. These two phases of the analysis are designed to show how manufacturing is coping: Is it running down – is Canada “deindustrializing” – or is what is happening a structural adjustment within the manufacturing complex to the more challenging world environment in which it must now exist? If its structure is being transformed, what are the characteristics of the system that is emerging? No attempt is made to evaluate the efficiency of industry in Canada *per se*, viewed independently of the trade adjustment criterion; although several comments arise in respect of productivity improvement, that much discussed subject lies outside the central concern of the monograph.

Finally, the study appraises Canada's revealed comparative advantage, in light of earlier Council work and some more recent investigations, and then juxtaposes the foregoing evidence in regard to structural realignments against these data on fundamental strengths of the Canadian economy.

Such a methodology is based on the recognition that one of the principal effects of any industrial policy, traditional or new-style, may well be to separate relative competitiveness from true comparative advantage – to make it possible, in other words, that industries and products without comparative advantage can nevertheless compete at home and perhaps abroad more effectively than others. As the textbooks explain, comparative advantage refers to the economic efficiency that results when factors available nationally are combined to produce a particular good in a country by comparison with that which results when they are used to produce another good in the same country. And the measure of efficiency is the opportunity cost of producing these respective goods vis-à-vis the similar output of trading partners.

The pattern of comparative advantage and disadvantage derives from each nation's relative endowments of resources, both physical and human, its technological/innovational characteristics, and the peculiarities of its industrial organization. However, an industrial-policy feature like an import tariff, for example, can make a product of comparative *disadvantage* competitive in the home market by altering the landed price of more efficiently produced foreign goods which would otherwise cause its shortcomings to be apparent. If the industrial-policy instrument is an export subsidy, then there is even the opportunity for products of comparative disadvantage to become competitive internationally.³

The main conclusion of this research is that a rather successful transition occurred in Canadian manufacturing during the 1960s and 1970s, without comprehensive governmental planning, from the fragile and vulnerable edifice subsisting under the regime of heavy import protection to a much more robust and appropriately structured complex today. The sector has not withered, and its internal adjustments over the period

covered have brought it more closely into conformity with this country's comparative advantage. However, the study recognizes that that stage is now behind us, and it does not dismiss out of hand the possibility that there could henceforward be other ways of improving the status quo – of seeking to shift the measure of comparative advantage to a new threshold.

Thus, although it expresses skepticism, the paper avoids firm and unequivocal inference that an industrial policy could not conceivably improve further Canada's long-term economic performance. The case for an industrial policy might yet be made, it allows, predicated on the new dynamics of technological innovation and product-cycle leadership – still a decidedly cloudy area of economic theory – and perhaps organized to take account of socio-political and other national-interest factors left out of the present treatment. That is a task for subsequent researchers, using different methods and having different terms of reference from those employed in this study.

2 Arguments For and Against an Industrial Policy

Industrialization and National Objectives

Most of the philosophical and technical discussion about industrial development, both generally and in the Canadian case, will be familiar to those readers of this paper who are economists. Nevertheless, to set the stage for what follows – and to provide necessary context for the non-specialist reader – it is useful to review that discussion.

The idea that positive encouragement to the creation and expansion of manufacturing is desirable, in terms of the national interest, has a long lineage. Industrial economies are widely perceived as having grown faster and achieved higher levels of prosperity, over the past two hundred years, than non-industrial economies. Indeed, nations with industrial muscle are seen to have been the imperial powers of the last century, while it was the primary producing countries that became their colonies. According to such conventional wisdom, in subsequent times most of these erstwhile colonial territories, seeking to develop economically, sought to foster manufacturing capability so as to achieve prosperity comparable to the former imperialists. Although this view of events is extremely superficial – Saudi Arabia and New Zealand are countries with relatively little manufacturing industry but high per capita incomes – it is politically appealing.

In recent decades the rationale for a policy of stimulating industrialization has been formalized in development theory, which refers to the principal means of realizing the desired end as “import substitution” – that is, substituting domestically produced manufactures for imported ones through various devices restricting purchases from abroad. There is no need to get into these complex arguments here, except to mention a few of the broad justifications for emphasizing industry.

First, there is the idea, supported by both theoretical and empirical research, that the marginal returns to agriculture and other primary industries tend to diminish, eventually, in an economy where these sectors are mature (as is usually the case). Manufacturing can provide a fresh fillip to the development process by opening up opportunities for much more rewarding new ventures than are available in its absence.

Second, it is felt that the prices of primary commodities tend to be set by conditions in the international market place – the individual supplier being largely powerless to affect what is obtained – whereas prices of manufactured products can to a considerable extent be established by their producers. There is a lot of controversy on this point, but it remains influential in policy making. Less subject to disagreement is the proposition that prices of agricultural products and industrial raw materials are much less stable than those of manufactures, and that the instability of income in economies highly dependent on primary goods production for export is a real disability in the effort to improve national well-being.

Probably of greater ultimate significance than these points is the notion that industrialization draws workers out of traditional and essentially rural spheres of activity such as agriculture, forest industries, fishing, etc., into “modern,” urbanized endeavours where the whole culture of work is more energetic and innovative, so that the productivity of society is transformed. A milieu is created in which entrepreneurship can flourish and influences from the most dynamic fields of enterprise, at home and abroad, can readily permeate. People thus become more competitive, more attuned to the advantages of new techniques and better ways of doing things, and at the same time more prepared to adopt the regimented disciplines of highly specialized labour in large-scale production systems.

Added to this effect on work attitudes and approaches is the overall increase in employment arising from industrialization, which often appears as a significant benefit in countries where joblessness is a problem or where there is pressure of population on the land. In some cases, indeed, political considerations make for a deliberate policy to enlarge the population, through fostering natural increase or boosting immigration, and then the attraction of manufacturing as a source of jobs is further enhanced.

Canada's “National Policy”

Most of these elements were present in Canada's early development strategy, the “National Policy” of 1879, which included expansion of manufacturing through the erection of a tariff wall as part of an overall design: a transcontinental railway was to be built, settlement of the West encouraged with the help

of land grants and assisted immigration, and the link with the United Kingdom tightened in several ways. The basic purpose of all this was to hold Canada's scattered parts together in face of the centrifugal forces inevitable in such a large area, as well as to resist any threatened encroachment by the United States. The fostering of manufacturing fitted in with that purpose because it would provide jobs for a population enlarged through immigration (which would in turn offer expanded markets for the factories) and by virtue of its location principally in Ontario and Quebec help to justify the railway through encouraging traffic between an industrialized centre and primary producing east and west.¹ However, over and above these more purely political purposes, an expansion of the manufacturing sector promised the results referred to above in respect of increased economic progress and stability and higher incomes. It was felt bound, therefore, to be a source not only of greater strength to the nation but also of improved welfare for the citizens as individuals.

Economists and others have questioned for years the merits of the National Policy – or at least of that aspect of it that related to import tariffs – since it served to shape a manufacturing complex in this country that suffers from clear competitive disadvantages. In particular, tariff protection tends to permit firms to start up business and remain in being whose operations are of insufficient scale, or insufficiently specialized, to produce goods at prices comparable to those of similar items made elsewhere. This is sometimes because the Canadian market itself is not big enough to support even a single plant so equipped as to be able to produce at optimum efficiency, and the manufacturer therefore in effect uses protection to bridge the difference between the costs of his less-than-adequate-scale product line and the foreigner's larger one. More often, though, the domestic market could sustain one or two internationally competitive operations but the protective duty makes it possible for several firms to operate profitably in Canada, each of which manufactures at less than cost-efficient scale.

Import Substitution as a Development Tool

Such is indeed the implicit drawback of import substitution as a development tool, recognized more and more as countries in parts of Asia, Latin America, and Africa have sought to apply this device in the massive effort to achieve economic "take-off" in the Third World since 1945. For a long while it was argued that the benefits of increased social dynamism and the opportunity for "learning by doing," as well as the more straightforward contributions to stability of earnings and other desired goals, justified the formation of "infant industries" that admittedly would not

be internationally competitive. However, after a period of undoubted success in achieving certain of these targets, economic planners have come to see that the absence of genuine market discipline beyond the confines of a small artificially nurtured, autarkic industrial system is a very real problem.

The trouble is that, once the immediate results of the import-substitution strategy are realized, further improvement requires that the nation begin to concentrate in its fields of comparative advantage, expanding production there to enter export trade at the same time as it withdraws from other industrial spheres in which its home market can more effectively be supplied from abroad. But the fragmented structure of industry (many firms or product lines of less than efficient scale) that has evolved under protection makes it hard to see where such comparative advantage lies, while vested interests in the status quo – businesses with sunk capital, workers with established jobs – tend to oppose strenuously the painful adjustment to a new situation.

It is now generally accepted that the transition from an import-substitution to an industrial-rationalization policy is crucial to ensure that the full benefits of economic development are realized. The requirement that exports come to represent a major factor in national output is one aspect of the change – obviously much greater for small economies than for larger ones since big countries can often achieve all necessary efficiencies simply on the basis of their own internal markets. However, it is really imports that are even more desirable, since the removal of barriers to alternative sources of goods and thus to needed sectoral and intrasectoral specialization is the only way to ensure that an appropriate structuring of industry will actually take place.

Definitions and Purposes in the Modern Context

In an advanced modern economy, such as Canada's, the relevance of industrialization as a goal is obviously different in the 1980s from what it was when the process first started. The risks associated with dependence on primary output – passivity in respect to prices of traded goods, instability of income derived from commodity exports, etc. – are by this time much reduced, and will remain so come what may. Moreover, whatever the international competitive capability of the manufacturing sector might have been initially, certain secondary industries are bound to have achieved viability, even if it is only in lines where imports are minimal because of the natural "protection of distance" or other factors that give domestic output an advantage. Further, a large range of service activities will have grown up, much of it more or less independent of manufacturing, that is inherently

insulated from foreign trade competition. These pursuits broaden the base of the economy and help to offset its sensitivity to externally derived influences on the primary sector. Again, if the variety of primary resources is as great as it is in Canada, countervailing demand and price tendencies will usually be experienced within that sector alone, to a substantial extent mitigating such drawbacks as are felt to exist in a reliance on commodity trade.

At the same time, some of the other advantages of industrial development will have been achieved, once and for all, so that no additional benefits remain to be made in those respects. Most notably, the attraction of workers to the more dynamic spheres of the economy and the society, with all the spin-off effects that this is designed to produce, cannot yield much more benefit once employment in agriculture and fishing is down to 5 or 6 per cent of the labour force, as it is in Canada now – especially given that those activities are likely to have become largely modernized themselves, in regard both to work methods and to the application of technology.

Escape from the inherent limitations of early development efforts through import substitution is thus clearly desirable once the initial industrialization goals have been realized. And, in recent times, the progressive reduction of import tariffs and other trade barriers under rounds of international negotiation through the GATT has seemingly ensured that protection for advanced economies has been substantially lowered. For example, the tariffs levied on all goods (dutiable and non-dutiable) imported into Canada today average out at just over 4 per cent of total value, compared to almost 10 per cent thirty years ago;² for all the intrinsic disadvantages of that measure of tariff levels, it clearly indicates a drop in the incidence of protection. Admittedly some of these effects have been offset through increased use of non-tariff devices, and for several years now exchange-rate changes have increased Canada's protection from U.S. suppliers (though they have reduced protection against imports from most other countries). But, unless it can be shown that trade liberalization has been totally neutralized by these factors (and our evidence will suggest otherwise), one must assume that overall protection has indeed fallen over the decades. The questions that now come to be discussed are as follows:

- Has the withdrawal of import protection encouraged adjustment into fields of comparative advantage, so that the desired transformation to a more efficient industrial economy is being realized?
- Is the effect, despite its economic rationality, that of eliminating much of manufacturing, to the benefit of the primary sector (whose inputs have become cheaper) and to the consumer, but to the

detriment of many businesses and their labour forces throughout Canadian secondary industry?

- Whether what is happening is structural adjustment or overall decline, will the effects be limited to upheavals suffered for perhaps a generation by particular firms and workers and the regions in which they are located, which is serious enough, or will it extend to a more fundamental weakening of vitality essential to Canada's future growth?

- Even if the consequence is most closely described in the first of the above points, is the efficiency improvement obtained without adverse results in respect of wider interests, including non-economic objectives of Canada as a nation?

We will attempt to cast some light on the first two of these questions and to offer tentative comments on the third. The fourth question lies outside the province of a purely economic appraisal.

Recent Canadian Initiatives and Discussion

Such concerns, which are shared with many other countries, give rise to the controversy over whether some sort of new industrial policy is called for, now that the old-style industrial policy through import substitution is being discredited. There are really two separate parts to the concept of industrial policy as it is at present being articulated. One, which is essentially defensive, argues that many industries vulnerable to foreign competition must be protected against wholesale dismemberment because, even if they are not efficient by world standards, they account for a lot of employment in parts of the country where alternative jobs are lacking. The other, which is innovative, suggests that government must intervene not just to ensure the survival of established industries but, more important, to assist the rise of industries that do not now exist or are in their infancy and yet which because of their special qualities will be vital to economic success in the next century.

Both of these elements are to be found in discussion of possible Canadian efforts to evolve a new industrial policy, as well as in some activity that goes beyond discussion to governmental initiatives.

For example, the series of devices to aid the textile and clothing industries, ranging from the textile policy of 1970 through to the arrangements for the textile and clothing sectors announced in 1981, all seek to slow down the rate at which Canadian production and employment in this field are being undermined by imports from abroad. The same could have been said – though with greater hope that the assistance would be temporary – for governmental support for the financing schemes to keep Chrysler of Canada and Massey-

Ferguson solvent. In light of their position at the time, perhaps even the purchase by the government of Canadair and de Havilland might be similarly perceived.

On the other hand, the extensive subsidization of industrial research and development that already occurs, to say nothing of the sweeping programs for promoting high technology advocated by groups like the Science Council, are aimed more at pushing ahead promising new enterprises than at simply keeping the old ones in being. And the schemes, either in place or being talked about, for curtailing foreign ownership of industry and enhancing the standing of wholly domestic concerns in the economy are intended, in great measure, to build up home-based endeavours that until now have played a relatively minor role in the Canadian scene, especially in respect of the development of new technology for 3 future economic gains.³

These distinctions should not be overdrawn, however, since there is invariably some connection between the one type of policy and the other, if not a very considerable blurring of the line that divides them. Thus, almost everybody involved in past and present measures to help the textile and clothing industries believes that much of the employment provided in those activities must sooner or later be replaced by jobs in growth industries, probably of the high-technology kind. Similarly, people concerned about the problems of Chrysler or Massey-Ferguson have been anxious that new developments in microelectronics or biotechnology should emerge to provide the sort of stimulus

hitherto derived from the automotive and farm machinery businesses, whose expansionary phase is now felt to be over in North America. It is also true, by contrast, that new enterprises fostered by virtue of their promise for future directions of industrial development may turn out to yield benefits that will aid the survival of threatened activities – as applications of microelectronics might yet revolutionize the garment industry and breakthroughs in energy technology give automobile producers a fresh lease of life.

Moreover, there are some features of envisaged or promulgated industrial policy that do not exactly fit into either of these categories. The mechanisms introduced in the 1970s to limit foreign investment in Canada, although partly designed to promote industrial development and technology in places where previously there was little indigenous capability, have also been seen as having a more general purpose: simply reducing the extent to which decisions that in aggregate represent an important determinant of the shape and behaviour of the Canadian economy are made by corporate executives living outside this country's jurisdiction. The implications of that aspect of the issue are such as to extend beyond the purview of this paper; they are not properly in the ambit of industrial policy as it will be considered here. But it is important to note the complexity of the purposes often being sought through governmental action having a major component of industrial intervention among its characteristics.

3 The Vulnerability of Canadian Manufacturing

The Scale-and-Specialization Bind

Problems of inadequate scale and thus insufficient specialization are a perennial topic of discussion among Canadian economists and businessmen. They have been quite extensively studied by the Economic Council, though except for some recent work not in depth for about a decade now.¹ In the meantime some new evidence has appeared which suggests that the difficulties for Canada in this respect may have been somewhat exaggerated or, alternatively, may not be quite as formidable today as they were considered to be ten years ago. But they are still a major factor in Canada's ability to compete internationally.

The basis for believing that a relatively small economy can have trouble achieving optimum efficiencies because of shortcomings in specialization lies in the famous propositions of Adam Smith about division of labour.

The greatest improvement in the productive powers of labour, and the greater part of the skill, dexterity, and judgement with which it is anywhere directed or applied, seem to have been the effects of the division of labour.²

Smith described the way in which the manufacture of pins was divided into about eighteen separate operations, each one of which was performed by a different worker repeating the same narrow function with immense skill and at high speed because of his long practice in that one task. He concluded:

This great increase in the quantity of work, which, in consequence of the division of labour, the same number of people [as under a less specialized system] are capable of performing, is owing to three different circumstances: first, to the increase of dexterity in every particular workman; secondly, to the saving of the time which is commonly lost in passing from one species of work to another; and lastly, to the invention of a great number of machines which facilitate and abridge labour and enable one man to do the work of many.³

But few products nowadays are as simple as pins, and in many industries the consumer demands such a bewildering variety of designs and styles and colours and other specifications in the goods offered that Smith's efficient methods of labour division are often hard to justify in any but the largest economies. Where there is a highly differentiated market structure, the profusion of product variety even for specialized firms or plants may mean that the market for each individual type of product is too limited, in smaller

economic systems, to allow of the use of the most effective labour-saving techniques. This problem was examined in the Canadian context many years ago by Stykolt and Eastman, who noted:

The most widely accepted hypothesis concerning the discrepancy in productivity in manufacturing between Canada and the United States holds that the small size of the Canadian market for manufactured goods necessarily results in sub-optimal scale for plants and firms, with a consequent loss of productivity. Those who argue from the small size of the Canadian market show that runs of single products in Canadian factories are shorter than in their counterparts in the United States, with the result that much more time is used in change-over for each unit of output.

The machinery used in Canada is often less efficient because indivisibilities in the use of the most efficient methods of production can be overcome only at higher scales of production than exist in Canada. Furthermore, the most automatic equipment, which is sometimes the most efficient, is also the most costly to reset when a change in the size or style of a product is required. The alternative sometimes adopted in Canada to using less-efficient or less-fully-automatic equipment is to acquire equipment which is most efficient and to bear the cost of conversion and resetting, or of keeping the machinery idle for part of the time when runs are insufficiently long to operate it continuously.⁴

All of this helped to hold levels of productivity in Canada at least 25 to 30 per cent below those in the United States during the 1950s and 1960s.

Some New Evidence on Minimum Economic Scale

These differences in Canadian and foreign productivity levels will be dealt with later, in Chapter 5, when we will see what has happened to the country's competitive position in more recent years. In the meantime it should be observed that interesting new data emerged in the 1970s about minimum efficient plant sizes, some of which indicated that Canada's domestic market was sufficiently large, in principle, to provide for fully efficient production techniques in the great majority of manufacturing industries.

The most authoritative of these contributions came from work by F. M. Scherer and his associates in 1975, where "the best current practice" in U.S. industry was assessed, enabling the authors to come up with a series of yardsticks as to the minimum efficient scale in a

number of product lines.⁵ The three most intriguing findings of this research, as interpreted for Canadian purposes, were (see Table 3-1):

- That the size of the top 50 per cent of Canadian plants in twelve important manufacturing fields was, on average, only about three-quarters of the minimum economic size, whereas comparable U.S. plants were typically somewhat larger than the minimum economic size.

- That in the vast majority of cases a plant of minimum efficient scale was nevertheless well within the dimensions of the Canadian market – indeed, usually far enough within those dimensions that three or more plants could exist in Canada and all achieve efficient size.

- That in a half of the cases studied the difference in unit costs of production as between plants of minimum economic size and those of only one-third that size was 5 per cent at most.

Another (U.S.) study of markets for manufactured consumer goods in the mid-1970s indicated that almost 70 per cent of the relevant enterprises would be efficient with plants having less than 250 employees and 44 per cent with plants having fewer than 100 employees.⁶ It found too that about 70 per cent of these enterprises could launch their fully efficient plants with a capital investment of under one million dollars. And it determined that, if a handful of activities such as the manufacture of automobiles and tires, petroleum products, and a few more were excluded, efficient operations could be assured in almost three-quarters of all consumer goods output (by value) for a market area containing only one million people; in fact, for a fifth of all such output the potential market area need cover only 200,000 people.

In a study in 1976, Gorecki compared the size of “survivors” among plants in Canada producing the same sorts of items that Scherer and his colleagues had examined in the United States – that is, he looked at the operations that had continued in being over time,

Table 3-1

Estimated Values of Minimum Efficient Scale in Twelve Industrial Processes, as of the Mid-1960s

	Minimum efficient scale (MES)	Difference between Canadian market and MES indicated ¹		Percentage by which unit cost rises in plants of one-third MES
		MES as a percentage of Canadian domestic consumption	Number of MES plants possible in Canada	
Beer brewing	4.5 million (31 U.S. gallon) barrels per year capacity	34.5	2.9	5.0
Cigarettes	36 billion cigarettes per year; 2,275 employees	76.9	1.3	2.2
Cotton and synthetic broad-woven fabrics	37.5 million square yards per year; 600 employees in modern integrated plants	5.7	17.4	7.6
Paints	10 million U.S. gallons per year; 450 employees	15.9	6.3	4.4
Petroleum refining	200,000 (42 U.S. gallon) barrels per day crude oil processing capacity	16.7	6.0	4.8
Nonrubber shoes	1 million pairs per year; 250 employees on single shift operation	1.7	59.2	1.5
Glass bottles	133,000 short tons per year; 1,000 employees	13.9	7.2	11.0
Portland cement	7 million 376-pound barrels per year capacity	15.2	6.6	26.0
Integrated steel	4 million short tons per year capacity	38.5	2.6	11.0
Antifriction bearings	800 employees	16.9	5.9	8.0
Refrigerators	800,000 units per year	142.9	0.7	6.5
Automobile storage batteries	1 million units per year; 300 employees	21.7	4.6	4.6

¹ Figure calculated using Canadian consumption data as of approximately 1967.

SOURCE F. M. Scherer and associates, *The Economics of Multi-Plant Operation: An International Comparison Study* (Cambridge: Harvard University Press, 1975), pp. 80 and 94; and Paul K. Gorecki, “Economies of Scale: The Measurement Problem,” a paper prepared for the Science Council of Canada, October 1977.

concluding that they must by definition be of viable scale within the protected Canadian market.⁷ In virtually all cases, these "survivors" were a small fraction of the size indicated by Scherer as the minimum necessary for efficiency (see Table 3-2), implying *prima facie* that the Canadian policy environment – which presumably means mainly its regime of import protection – was at that time preventing the concentration of production into facilities that would be consistent with this country's market scope. Gorecki warned, however, that a plant of well below minimum efficient size could sometimes out-perform a larger operation because the big one failed to utilize its potential for cost-reduction effectively; thus the differences between his "survivors" and Scherer's "best current practice" represented the upper limits of what a change in Canada's policy inhibitions might make possible, in the most promising of circumstances.

Table 3-2

Indicators of Minimum Efficient Plant Size Expressed as a Percentage of Industry Size for Seven Canadian Manufacturing Industries, 1967

	Indicators of MES	
	Survivor ¹	Engineering
	(Per cent)	
Petroleum refining	1.1	16.7
Nonrubber shoes	1.0	1.7
Integrated steel	0.2	38.5
Refrigerators and freezers	3.7	142.9
Automobile storage batteries	4.3	21.7
Bakeries	0.3	2.5
Bricks	1.4	3.1

Note: Gorecki (1976, Appendix D) indicates the comparability of industry definitions used in the survivor and engineering estimates.

¹ This column refers to the survivor estimate of MES measured over the period 1961-66.

SOURCE: Paul K. Gorecki, "Economies of Scale: The Measurement Problem," a paper prepared for the Science Council of Canada, October, 1977, based on earlier (1976) study for Department of Consumer and Corporate Affairs, Ottawa.

Despite their caveats and reservations, these studies thus tended to confirm the impression that Canada's scale-and-specialization problem was more a result of trade protection than of the sheer scale of the national market itself.

Foreign Ownership and the "Truncation" Effect

Shortcomings related to the matter of scale and specialization are not, however, the only factors held to

be preventing Canadian manufacturing industry from achieving full efficiencies. For a long time some economists and others have been equally if not more concerned about the effects on Canada's industrial development of the large degree of foreign ownership and control in the country. As we have already remarked, some of the worries about foreign investment extend well beyond the confines of industrial policy. But there are characteristics of this phenomenon – at least as it is seen by its critics to operate within the industrial system of a host nation – that certainly relate to the questions of structure, trade competitiveness, and overall efficiency every bit as much as the scale-and-specialization issue does.

Probably the most searching and thorough analysis of this matter was the famous "Gray Report" – *Foreign Direct Investment in Canada* – published by the federal government in 1972.⁸ A key section of that report outlined what it referred to as the "truncation" effect on corporate growth in Canada of much of the foreign direct investment that has taken place.

"Truncation" is a term used to describe the nature of a subsidiary which does not itself carry out all the major functions usually associated with a modern corporate enterprise. The degree of truncation may vary substantially, depending upon the extent to which these functions are performed by the parent and/or other affiliates and the extent to which they are performed by the subsidiary in Canada. In one case, the parent may reserve to itself all the major managerial decisions, research and development and a variety of other functions. The parent may deny the subsidiary the right to export and require the subsidiary to accept from it a number of components and other inputs. Alternatively, the subsidiary may be permitted greater scope⁹

One common result of truncation, according to the report, was the creation of a Canadian subsidiary which was a "miniature branch plant replica" of the parent firm – that is, it adopted the same technology and turned out a virtually identical product line, but on a considerably smaller scale because it was limited to the Canadian market and often operated as part of a protected oligopoly with other subsidiaries of foreign companies. In these instances, then, foreign ownership produced the worst manifestations of the scale-and-specialization problem as well as other drawbacks of truncation as noted above.

The Gray Report was nevertheless at pains to point out that truncation of a subsidiary in Canada need not necessarily contribute to economic inefficiency. Sometimes it was the only way for a parent firm to reduce costs and locate activity in this country. The report observed that there was no *a priori* way to distinguish efficient from inefficient truncation because of the distortions in the domestic and international economies, mostly related to trade barriers of various kinds.

In more recent years the main impetus for action on this issue has come from the Science Council of Canada. In its report *Uncertain Prospects: Canadian Manufacturing Industry, 1971-1977*,¹⁰ the Council enlarged on the theme of industrial inadequacy derived from the consequences of foreign investment, and this subject was further expanded in a background study by Britton and Gilmour, *The Weakest Link: A Technological Perspective on Canadian Industrial Underdevelopment*,¹¹ prepared under its auspices in 1978. The latter document commented that:

Foreign-controlled firms have a higher propensity to import capital equipment, material inputs, and services related to production. In many cases the high propensity to import from the parent organization maintains the foreign subsidiary as a warehouse/assembly type of facility. This in turn inhibits growth in the size of the industry, reduces the numbers of jobs it offers, restricts the range of skills required, increases imports, and increases Canada's need to export more raw materials. Exports of finished goods are unlikely as these are restricted to the parent . . . or they are blocked by the establishment of subsidiaries in other economies.¹²

The authors suggested that as the proportion of an industry under foreign control rises it gradually becomes a shell, with large elements of the production system missing or deficient.

Ultimately, the growth potential of the foreign-dominated industrial groups is severely curtailed, and their size will be relatively small compared with the same groups in other countries. At this stage, industrial growth at best merely reflects domestic demand.¹³

Adjusting to Reduced Protection

In his monograph, *How Ottawa Decides: Planning and Industrial Policy-Making 1968-1980*, published by the Canadian Institute for Economic Policy, French notes that the basic philosophical position underlying any individual's attitude to the idea of industrial policy will be one or other of two sharply differing alternatives: free trade or what the Science Council has dubbed "technological sovereignty."¹⁴ While these elements are not mutually exclusive, the key question is whether trade liberalization should come first, producing the conditions of market access that will permit an escape from the scale-and-specialization syndrome, or whether free trade will only result in the swamping of relatively inefficient Canadian manufacturing industry by foreign competitors if its position is not improved in advance through special measures. The nature of those special measures, which add up to the concept of technological sovereignty, is what the Science Council's case is all about. French argues that the federal government, as guided in such matters by its bureaucratic planning apparatus, has been unable to decide positively in favour of either of these options

and has instead followed a path that is characterized by compromise and incrementalism. Nonetheless, one must recognize that tariff barriers in Canada and other countries *have* been reduced, over the six rounds of formal GATT negotiations since World War II, by very considerable amounts. This fact is extremely important in forming a judgment as to the need for an industrial policy and the best way of implementing such a policy if it is required.

The conclusion of the Tokyo Round of trade bargaining in 1979 will mean that within a few years some 84 per cent of the industrialized world's imports subject to "most-favoured-nation" treatment will be accounted for by countries whose weighted average tariffs are less than 5 per cent, while virtually all such commerce will pay a tariff below 8 per cent.¹⁵ The weighted average of import tariffs levied by Canada will remain one of the highest among developed nations at 7.9 per cent (see Table 3-3), but relative to the average before the Tokyo Round of 12.7 per cent that still amounts to a reduction of well over a third. If Canadian manufacturing is incapable of withstanding the effects of a move to free trade without first achieving technological sovereignty, then some of the unhappy consequences must surely be starting to appear by virtue of the degree of trade liberalization already instituted.

Table 3-3

Tariff Averages¹ on Industrial Products (Excluding Petroleum) for Ten Developed Markets Before and After the Implementation of the Tokyo Round Agreements

	Before the Tokyo Round	After the Tokyo Round	Reduction rate
(Per cent)			
European Economic Community	6.6	4.8	27
Sweden	5.2	4.3	23
Norway	4.2	3.2	23
Switzerland	3.2	2.5	23
Austria	9.0	7.8	13
Finland	6.0	4.8	20
United States	6.2	4.4	30
Canada	12.7	7.9	38
Japan	5.2	2.6	49
New Zealand	22.4	17.6	21

¹ The comparability of tariff levels, and of their practical incidence, is affected by differences in methods of valuation for customs purposes. The tariff averages set out in the table include duty-free items. It should be noted that averages disguise the variation in tariffs, some countries having wider variations in their tariff schedules than others. Here the simple average on each tariff line is weighted by each market's MFN imports on that line.

SOURCE Trade Policy Research Centre (London), *The World Economy* 2, no. 3 (September 1979), p. 328.

Needless to say, that is a somewhat oversimplified proposition for several reasons. Because the Tokyo Round agreements were reached comparatively recently, data used in this study reflect only the very beginnings of the adjustment to what is entailed under that round, at most. Further, although the GATT negotiations sought to include codes on other trade restrictions – the so-called “non-tariff barriers” – many of these obstacles do in fact continue to limit the free flow of goods across international boundaries. Given the tendency to utilize all such devices for the protection of industries that are the most vulnerable,

an appraisal of the impact of lowered import restraints to date would not provide a totally satisfactory impression of Canada’s industrial viability in the 1980s. But it ought certainly to show whether a successful shift from an import-substitution to an industrial-rationalization economy has been occurring, as the harsh winds of foreign competition have intensified following the Kennedy Round and earlier tariff-cutting negotiations, or whether instead the opening up of trade has caused Canadian manufacturing to wither and only primary production to gain.

4 Is Canada Deindustrializing...?

Economic Evolution and Post-Industrialism

One of the characteristics of advanced economies is the tendency for manufacturing industry – indeed goods production of all kinds – to shrink in importance, after a certain point, relative to service-producing activities. The trend is most visible in respect to employment: whereas the proportion of total employed manpower that was engaged in manufacturing in 1970 was just below 25 per cent in the United States and Canada, a little under 30 per cent in France and Japan, 35 per cent in the United Kingdom, and 40 per cent in West Germany, the shares are now down to about 20 per cent in the two North American countries, around 25 per cent in France and Japan, 30 per cent in the United Kingdom, and 35 per cent in West Germany (see Chart 4-1). This is not just a cyclical phenomenon associated with the problems of the last decade; in mature industrial systems such as the United Kingdom, the United States, West Germany, Belgium, The Netherlands, Australia, Canada, and Sweden it has been going on at least since the mid to late 1960s and in France, Italy, and Japan since the mid 1970s. Only in countries such as Finland, Spain, Portugal, and Ireland is manufacturing still not declining relative to all industries as an employer.

The swing away from manufacturing toward services as a source of employment reflects in large measure the remarkable increases in labour productivity in secondary industry, which has contrived to turn out more goods with fewer workers and thus to free people for jobs in the service sector, where productivity gains have been much less readily obtained. It is also apparent, though, that demand for services expands rapidly in high-income economies, and further that refinement of corporate practices and organizational arrangements nowadays involves the undertaking of certain tasks, hitherto considered an aspect of manufacturing, in specialized firms or facilities that statistical surveys classify as “services.” These complications make it difficult to see exactly what is going on.

Clearly, there is no reason to suppose that manufacturing industry must account for a fixed proportion of employment or indeed of production itself. In 18th-century France a group of thinkers known as physiocrats argued that agriculture was the only true creator of wealth, all else being simply a load on the farmer’s

back. Today we look upon such ideas as quaint because it is evident that manufacturing adds many times as much to the national product as agriculture does, despite the fact that farming is immensely more productive than it was two hundred years ago. We can perceive, in retrospect, that the same sort of technical developments that sparked the Industrial Revolution also served to revolutionize the farm, helping to make resources (including labour) available for vastly expanded output in the new factories without in any way jeopardizing the effectiveness of agriculture. Thus no one worries about “deagriculturalization,” even though the number of people employed on the land in advanced countries now represents well under 10 per cent of the work force in many instances and the proportion of GNP derived from farm operations is not much higher.

In essence the same attitude should apply to what is now being referred to as “deindustrialization,” provided that any relative contraction of manufacturing occurs in response to an enlargement of services genuinely demanded by consumers or by other forces in the market. The originators of the term deindustrialization, who seem to have been the British economists Bacon and Eltis, were bothered by excessive growth of what they called the “non-market” sector in the United Kingdom, most of which produced governmental or government-supported services.¹ It would be foolish to pretend that a problem of that kind does not exist in Canada, and attention to it is undoubtedly justified. But one ought not to confuse this issue with the subject of competitive capability and trade performance in manufacturing, which is something else altogether.

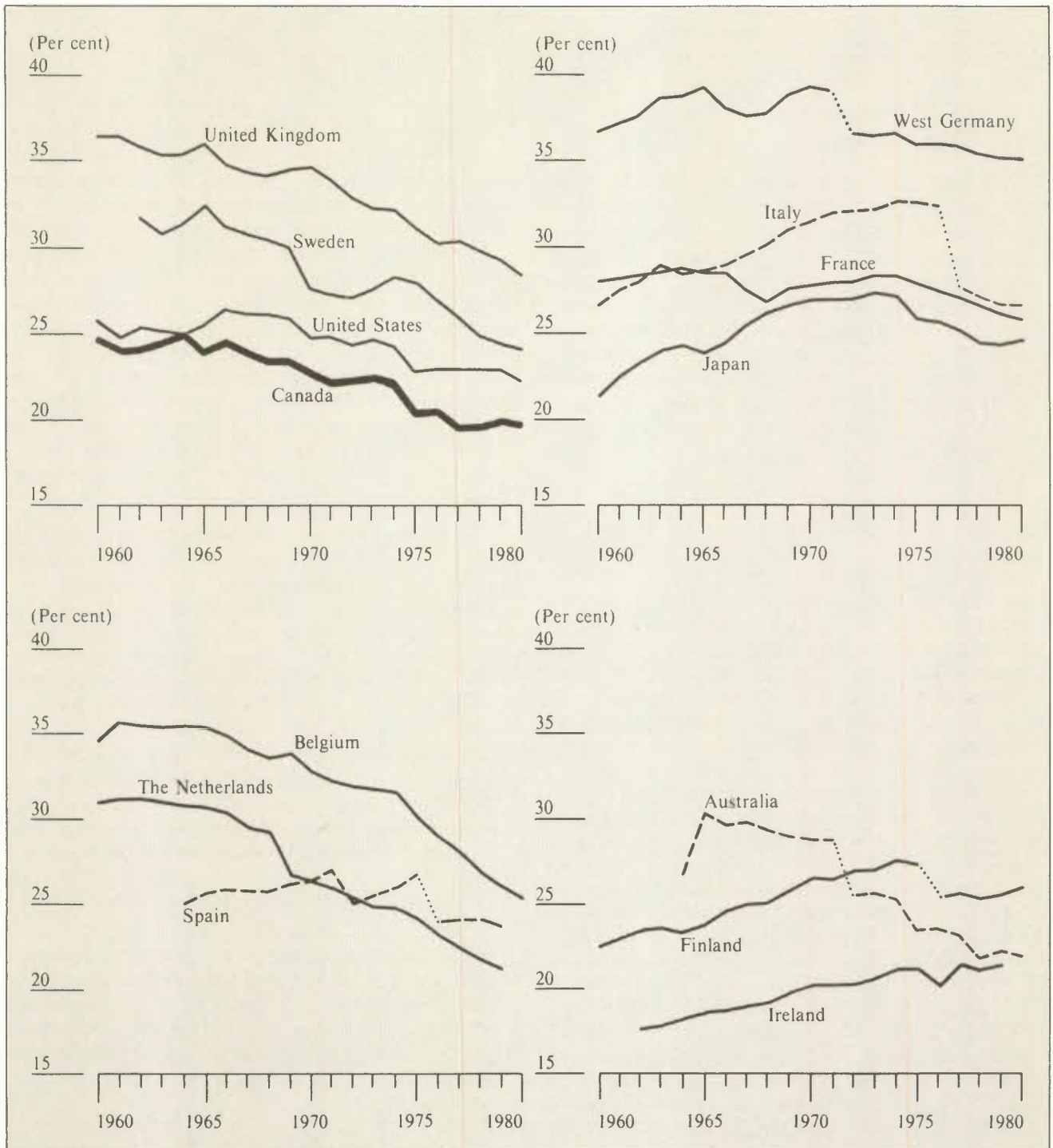
Therefore, before becoming embroiled in discussion of such esoteric questions as whether we are entering a “post-industrial” era, in which the main element will be “knowledge industries” dealing, by their nature, mainly in intangibles, it will be well to examine more mundane matters in respect of our existing manufacturing complex.

Relative Competitiveness of Canadian Manufacturing

The measurement of a country’s relative industrial competitiveness is not an easy business. The next chapter will contain an assessment of relative costs and prices of Canadian manufacturing output against

Chart 4-1

Employment in Manufacturing as a Percentage of Total Employment, Selected Countries,¹ 1960-80



¹ Dotted lines are used at times of revision of data base.

SOURCE *Year Book of Labour Statistics* (Geneva: International Labour Office, various issues).

similar figures for other advanced economies. However, it is important to bear in mind that, viewed over a sufficiently ample time horizon, any nation's industries in the tradeable sectors *must*, as a whole, be competitive. That is to say, if the country is to maintain a viable international balance of payments the overall competitiveness of goods and services in general cannot be allowed to deteriorate continuously; if that begins to happen, there is no escaping the necessity to devalue the currency so as to restore equilibrium. This basic economic truism is often lost sight of, and one sees absolute costs in two countries compared over time as if the equilibrating effects of the exchange rate did not exist. Such comparisons are essentially meaningless.

Nevertheless, while the total international trade and payments position of a country must remain in balance, it is certainly possible to lose competitiveness in particular sectors. Indeed, competitive capability could be lost across the entire spectrum of manufacturing industry, the trade setbacks in that area being made good through increased export success (or reduced penetration of imports) in the primary goods or service spheres – plus, of course, strengths in the capital account if that is a positive factor. Such a deterioration in the competitive position of manufacturing vis-à-vis the primary and tertiary sectors could legitimately be described as “deindustrialization,” at least in principle.

Quite different from such an across-the-board decline in manufacturing trade is a shift of competitiveness within manufacturing, with some gainers and some losers. At a time of falling trade barriers like the past fifteen or twenty years, the structure of industry can be expected to have changed, bringing forward genuinely competitive manufacturing enterprises – or, more correctly, products – at the expense of others whose uncompetitiveness was previously shielded by the protective tariff wall. But that is obviously not “deindustrialization”; unless some particular type of industry is considered more valuable than another – a point we will examine later – intraindustry shifts are hardly to be seen as adverse to national well-being in themselves.

The main issue, then, is whether what has been happening in Canada over the period covered in this study is a decrease in the competitiveness of manufacturing as a whole, relative to the other economic sectors, or rather a shift among manufacturing industries and product categories in respect of competitive capability. In our analysis, we will first look at the performance of Canadian manufacturing generally in the international economy. Has there been a loss of position right across the sector, offset by more satisfactory results in the primary and/or tertiary industries (plus positive changes on capital account)?

The measure of that position that we will assess initially is one that does not have to take account of the relative performance of other sectors: Canada's share of world markets for manufactured goods can increase without causing the shares of primary products or services to (fall or the capital account to alter) so long as imports rise, in total, to match the export gain. If the competitiveness of the whole Canadian industrial complex were improving, but the improvement in the primary and/or tertiary sector were more marked than that in manufacturing, then the share of world markets secured by Canada's manufacturers could expand even though their relative competitiveness – that is, relative to other Canadian sectors – was declining. However, most observers of the industrial scene will be interested in seeing simply how the world-market-share data appear of themselves, since the common perception is quite unlike what has just been described; regardless of the relative performance among sectors, Canada is seen as losing ground generally in international commerce.

With respect to the next question that we will explore – the behaviour of Canadian manufacturing costs and prices by comparison with other countries – there is a much greater need to recognize the importance of what is happening in other sectors. Let us suppose that costs in the rest of the world remained stable, whereas Canada's manufacturing costs rose by 10 per cent. That does not necessarily mean that Canadian manufacturing must suffer declining international markets and greater import penetration, because if costs increased by 15 per cent in traded-goods sectors other than manufacturing there would have to be an exchange-rate realignment – a drop in the external value of the Canadian dollar – of more than 10 per cent in order to maintain balance-of-payments equilibrium. The result would be an improvement, rather than a deterioration, in the competitiveness of Canada's manufactured products in world trade.

Wherever possible, therefore, appropriate comparisons of cost behaviour across the whole range of industries should be used – although they are often difficult to secure, especially since it is only the traded (and trade-competing) goods and services whose cost performance is fully relevant here. Fortunately one may also escape the limitations of this problem, in part, by looking at ratios: import penetration, export orientation, and “implicit self-sufficiency,” for example, which show the consequence of relative competitiveness without the need to know what occurred in the different cost performances causing it.

“Implicit Self-Sufficiency”

We will use those ratios a good deal. The one that is of greatest importance is that illustrated in Table 4-1 since it shows in the right-hand four columns how the output of all major industry groups relates to the Canadian market. (“Apparent domestic availability” – domestic shipments plus imports minus exports – is really just an elaborate way of describing the home market in each case.) What is perhaps most noteworthy about those columns at first glance is their stability: predominantly export-oriented sectors, like agriculture, fishing and trapping, and mining, maintain much the same relationship of output to ADA – called here “implicit self-sufficiency” – over the whole period of a decade and a half that is covered. There seems to be some loss in mining, which may be offset in agriculture. Manufacturing, as we will have occasion to remark in more detail shortly, retains virtually the same implicit self-sufficiency throughout.

Not only do these figures for manufacturing alone suggest that Canada’s secondary industry held its own in international trade over the period, but the juxtaposition with data for other sectors provides strong inferential evidence (as noted above) of relative competitiveness within the spectrum of Canadian industrial activities. In light of that *prima facie* evidence one is entitled to be less nervous of comparing certain costs and prices with those of foreign countries than would otherwise be the case. We attempt a number of such comparisons in Chapter 5, employing both national currency and U.S. dollar bases in most series to show the exchange-rate effects. Even so, the caveats already mentioned should not be lost sight of.

A final observation to be made before beginning these analyses is that calculations of competitiveness arrived at by such means say nothing about the efficiency of Canadian manufacturing or its productivity performance *by comparison with other nations*. The point at issue in the present chapter and the one following is whether Canada is “deindustrializing” – suffering a net shrinkage of the manufacturing sector *relative to other sectors* – because of its experience in the international marketplace. If it is, that will imply that efficiency in manufacturing is lacking *vis-à-vis* other elements of the economy; if there is no evidence of deindustrialization, one may infer simply that manufacturing efficiency has not fallen relative to the other sectors in Canada. Whether efficiency anywhere in the Canadian economy is satisfactory from an overall national point of view is another subject.

Manufactured Goods Deficit and Share of World Markets

Because of the problems of scale and specialization, as outlined earlier, plus the comparative advantage of many Canadian primary products industries, it is not very surprising that this country has long experienced deficits in its trade in manufactured goods despite the import-substitution policy. For the two Statistics Canada categories “fabricated materials, inedible” and “end products, inedible,” the deficit rose from less than \$1 billion in 1960 to \$2.5 billion in 1981 (see Table 4-2), with a small surplus only in the two years 1970 and 1980. However, reflecting the Canadian advantage in primary product resources, as well as the bias in

Table 4-1

Import Penetration, Export Orientation, and Implicit Self-Sufficiency in Canadian Goods Production, Selected Years, 1966-80

	Import penetration ¹				Export orientation ²				Implicit self-sufficiency ³			
	1966	1970	1975	1980	1966	1970	1975	1980	1966	1970	1975	1980
	(Per cent)											
Agriculture	8.1	8.9	9.9	12.8	29.4	24.5	29.7	36.4	130.2	120.7	128.2	137.1
Forestry	1.9	1.9	2.9	2.2	4.4	4.1	2.2	2.5	102.6	102.4	99.2	100.3
Fishing and trapping	2.7	3.8	10.5	12.1	32.6	37.9	36.2	42.6	144.3	155.0	140.3	153.0
Mining	28.3	25.7	49.6	36.6	47.2	52.2	62.9	45.2	135.8	155.6	135.8	115.8
Manufacturing	21.0	25.5	28.8	31.5	18.8	26.2	23.9	30.8	97.2	101.0	93.6	98.9
Total	20.4	23.5	28.4	30.2	21.3	27.1	27.6	32.2	101.1	105.0	98.8	103.1

1 Ratio of imports to “apparent domestic availability” (domestic shipments plus imports minus exports).

2 Ratio of exports to domestic shipments.

3 Ratio of domestic shipments to “apparent domestic availability.”

SOURCE Economic Intelligence Group, Economic Policy and Analysis, Department of Regional Industrial Expansion.

Table 4-2

Canada's Merchandise Trade Balance, on Customs Value Basis,¹ 1960-81

	Food, feed, beverages and tobacco including live animals	Inedible crude materials	Inedible manufactured goods				Total
			Total	Fabricated materials	End products	Special transactions	
(\$ Millions)							
1960	410	380	-812	1,419	-2,230	-74	-96
1961	641	442	-871	1,411	-2,282	-85	127
1962	582	544	-928	1,454	-2,382	-108	90
1963	690	538	-699	1,579	-2,278	-107	422
1964	1,054	662	-711	1,746	-2,457	-189	815
1965	950	766	-1,345	1,671	-3,016	-238	134
1966	1,146	908	-1,479	1,772	-3,251	-303	271
1967	802	1,091	-1,102	2,031	-3,133	-245	547
1968	707	1,346	-519	2,481	-3,000	-215	1,319
1969	423	1,388	-918	2,335	-3,253	-153	741
1970	785	1,921	288	3,060	-2,772	-127	2,868
1971	975	1,950	-587	2,776	-3,363	-135	2,202
1972	981	2,030	-1,376	3,128	-4,504	-154	1,481
1973	1,218	3,027	-1,952	4,107	-6,059	-197	2,095
1974	1,395	3,739	-4,211	4,446	-8,657	-204	720
1975	1,505	2,892	-5,541	4,130	-9,671	-243	-1,387
1976	1,461	3,238	-3,361	6,195	-9,555	-357	981
1977	1,337	3,544	-2,343	8,071	-10,414	-346	2,192
1978	1,563	2,959	-1,179	10,549	-11,728	-268	3,075
1979	2,120	4,585	-3,547	12,515	-16,062	-387	2,771
1980	3,517	3,434	459	16,848	-16,389	-525	6,885
1981	4,263	3,075	-2,547	16,339	-18,887	-242	4,549

¹ Such measures are not completely consistent with the more common balance-of-payments measures; however, the latter are not available on a commodity basis.

SOURCE Based on export and import data from Statistics Canada.

foreign import tariff systems protecting fully manufactured goods more than intermediates, the overall deficits in fact comprised continuing and growing surpluses in the trade in fabricated materials which were outweighed by larger and similarly continuing and growing deficits in the trade in end products.

We will have occasion to return to this distinction between more- and less-highly processed manufactures later. For the moment let us note that the growth in both the deficit on manufactured goods trade as a whole and the deficit on end products trade by itself are more striking statistically than they are alarming as indicators of the state of Canadian industry. This is because their enlargement, allowing for substantial cyclical fluctuation, has remained roughly proportional to the corresponding increase in trade generally and indeed to the expansion in the size of the national economy. Calculated with reference to these measures, over the past twenty years the deficit in manufactured goods has ranged from high points in 1960-62, 1965-66 and 1975, when it was equivalent to more than 10 per cent of the value of Canada's total trade or 2 to 3 per cent of the GNP, to low points in 1970 and 1980 (when

it actually disappeared, as observed above); in the late 1970s and early 1980s it amounted essentially to less than 4 per cent of total trade or 1 per cent of the GNP (see Table 4-3 and Chart 4-2). The deficit in end products alone has ranged from the equivalent of almost 70 per cent of total trade in 1960 down to less than 20 per cent in 1970 and back to around 25 per cent in the late 1970s and early 1980s; in terms of GNP it has gone from 6 per cent in 1960 to 3 per cent in 1970 to again about 5 to 6 per cent in the most recent period. Thus, although these deficits have increased over the twenty years when measured in dollar amounts, they have if anything declined when set against the country's total trade and output.

Whether that is an adequate performance is a central question in this sphere. Before we attempt to answer it let us pause to note the Canadian record on manufactured goods exports, viewed in global terms. Most figures cited show the performance to be one of falling shares of the international market, as appears to be the case if current unadjusted values are the measure. However, in constant U.S. dollars – probably a better guide (at least until recently) – Canada's share

Table 4-3

Canada's Normalized Merchandise Trade Balance,¹ 1960-81

	Food, feed, beverages and tobacco including live animals	Inedible crude materials	Inedible manufactured goods			Total
			Total	Fabricated materials	End products	
(Per cent)						
1960	26.0	20.3	-11.1	34.4	-69.1	-0.9
1961	33.8	22.4	-11.3	33.5	-65.2	1.1
1962	30.4	24.8	-11.1	32.8	-60.8	0.7
1963	30.7	23.1	-8.0	33.4	-56.0	3.1
1964	39.9	25.6	-6.9	32.5	-49.7	5.2
1965	38.2	27.6	-11.4	28.3	-50.8	0.8
1966	40.8	30.2	-10.4	27.9	-41.2	1.3
1967	31.9	34.8	-6.7	31.1	-32.0	2.5
1968	27.8	37.4	-2.6	33.8	-24.5	5.1
1969	16.6	39.0	-4.0	28.7	-22.4	2.6
1970	26.0	45.1	1.2	34.7	-19.2	9.3
1971	29.6	42.5	-2.3	30.7	-20.6	6.6
1972	25.9	39.7	-4.6	30.4	-23.2	3.8
1973	23.5	42.9	-5.4	32.4	-25.7	4.3
1974	21.7	31.5	-9.3	25.5	-30.8	1.1
1975	21.9	22.1	-11.6	25.8	-30.5	-2.0
1976	20.3	24.1	-6.1	33.3	-26.5	1.3
1977	16.8	25.0	-3.6	36.6	-24.7	2.5
1978	17.1	20.1	-1.5	37.6	-23.1	3.0
1979	20.0	22.3	-3.7	34.2	-26.7	2.2
1980	26.8	13.1	0.4	39.9	-26.0	4.7
1981	28.9	11.2	-2.1	36.0	-25.7	2.8

¹ The normalized trade balance is the trade balance as a percentage of total trade (exports plus imports).

SOURCE: Calculated by Economic Intelligence Group, Department of Regional Industrial Expansion, and estimates by Economic Council of Canada based on data from Statistics Canada.

of manufactured-goods exports of all the world's developed market economies rose from just over 3 per cent in 1960 to a little over 4 per cent in the late 1960s and subsequently (see Table 4-4). That proportion has in effect been almost unchanged since 1970 or so, paralleling the experience of most other countries except Japan and Italy (whose shares have gone up) and the United Kingdom, Sweden, and Switzerland (whose proportions have gone down); but the total trade volume has, of course, grown enormously.

So far as the main markets are concerned (and these numbers are in current rather than constant dollars), Canadian goods represented a pretty consistent 23 to 25 per cent of the United States' imports of manufactures from all sources over the 1960s and 1970s (save for a jump to around 30 per cent in the late 1960s because of Vietnam); they accounted for a slowly declining proportion of the EEC's overall imports, going down from 4.5 per cent to rather under 3 per cent; and they captured a gradually increasing share of the Japanese market, up from 2.5 per cent in 1960 to almost 4 per cent in the late 1970s. More recent statistics indicate a continuation of these trends.

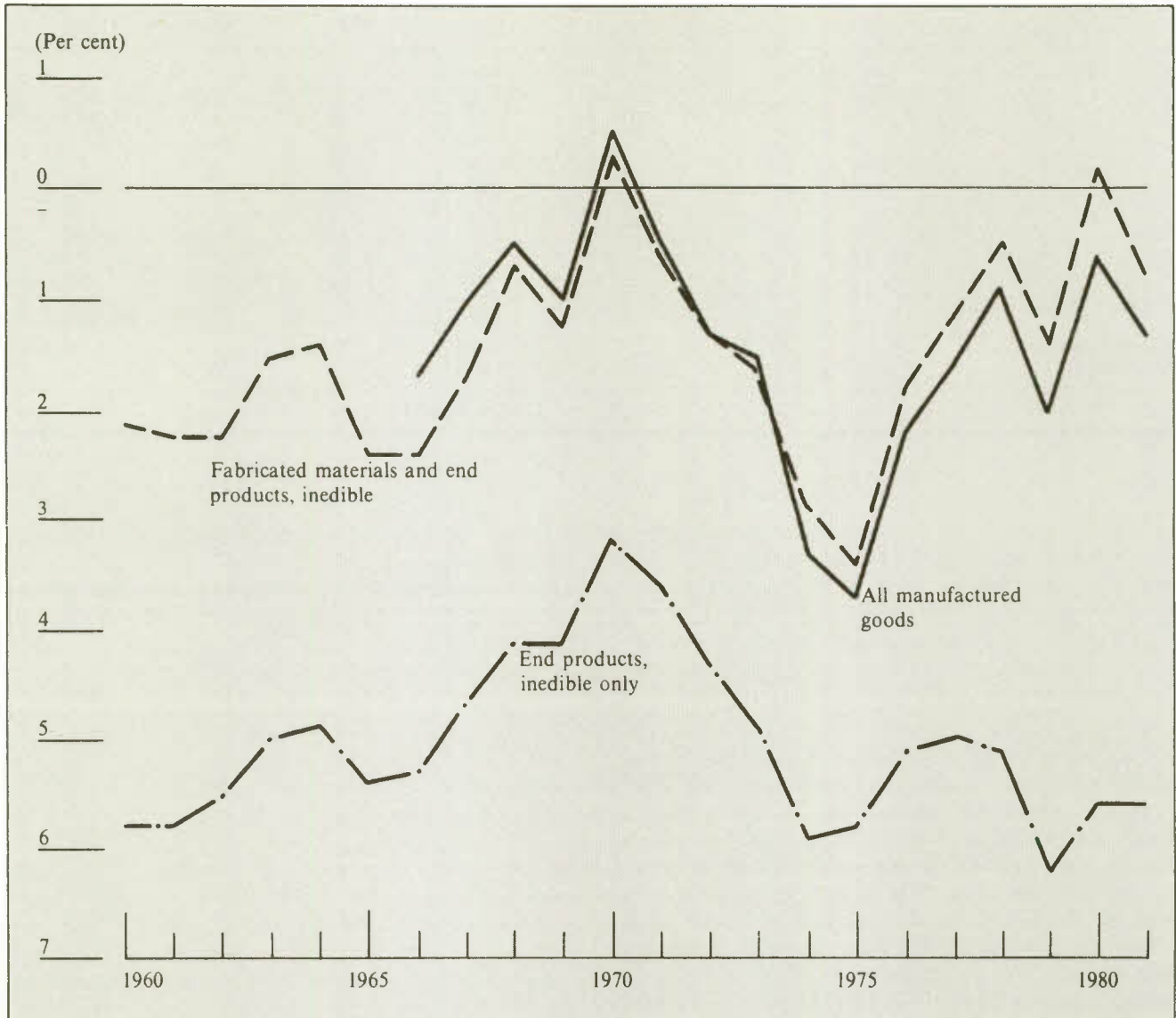
The finding is, therefore, that Canada's manufactured goods have approximately held constant as a share of the international market when assessed in aggregate. Let us look at the import and export side in a little more detail, evaluating the general behaviour of Canadian manufactured products as competitors in the trade system.

Import Penetration and Export Orientation

The key measurements of competitive performance are the penetration of Canada's market by foreign goods, calculated over a sufficient time to show any trend, and the orientation of Canadian goods to foreign markets, likewise evaluated over a period to reveal its increase or decrease. There is a well established method to illustrate these relationships, based on the figures for domestic shipments – the movements of Canadian-made products from the factory gates – and for exports from and imports to this country. We have already had occasion to refer to such an assessment, as

Chart 4-2

Trade Balances in Manufactured Goods as a Percentage of GNP, Canada, 1960-81



SOURCE Based on data from Statistics Canada.

outlined in Table 4-1. Let us now look at the behaviour of manufacturing industry on that basis, confining our attention to the bottom line and what the three sets of columns reveal about changes in trade into and out of Canada.

The development most immediately apparent is that, for manufacturing as a whole, the penetration of the Canadian market – i.e. the ratio of imports to “apparent domestic availability” (domestic shipments plus

imports minus exports) – between the mid-1960s and 1980 rose from about 20 to more than 30 per cent. At the same time, however, the orientation of Canada’s manufactures to foreign markets – measured as exports relative to Canadian domestic shipments – also rose, from less than 20 to around 30 per cent. As we noted earlier, the ratio of domestic shipments of manufactures to apparent domestic availability (“implied self-sufficiency”) remained almost exactly constant over the decade and a half, ranging from a high of 101.0 per cent in 1970 to a low of 93.6 per cent

Table 4-4**Major Industrial Countries' Shares of Total Manufactured Goods Exports of Developed Market Economies, Based on Constant U.S. Dollars, 1960-81**

	1960	1970	1975	1978	1979	1980	1981
	(Per cent)						
Belgium and Luxemburg	5.2	5.7	5.3	5.4	5.3	5.2	4.9
Canada	3.3	4.4	3.8	4.3	4.3	4.1	4.2
Denmark	1.0	1.2	1.1	1.0	1.0	1.0	1.0
France	9.1	8.4	9.2	9.2	9.6	9.0	8.9
West Germany	19.0	20.4	18.4	17.9	18.3	18.1	18.5
Italy	4.1	6.4	6.7	7.6	7.8	7.0	8.2
Japan	5.3	10.3	12.3	13.4	12.5	14.0	14.8
The Netherlands	3.8	4.2	4.5	4.2	4.4	4.3	4.2
Norway	1.2	1.3	1.2	1.1	1.0	0.9	0.8
Sweden	3.4	3.5	3.2	2.8	2.8	2.6	2.5
Switzerland	4.0	3.2	2.8	3.0	2.9	2.8	2.8
United Kingdom	14.6	9.1	8.4	7.9	7.6	7.2	6.4
United States	20.1	14.9	16.4	14.6	14.9	15.9	14.6

SOURCE Calculated from data on manufactured goods exports from United Nations, *Monthly Bulletin of Statistics* (New York: United Nations, various issues).

in 1975 and returning to 98.9 per cent in 1980. The broad picture, that is to say, is of increased mutual penetration of markets – which is entirely what one would expect given the liberalization of world trade over the period – with no discernible loss of net position by Canada.

Unfortunately the data available do not permit one to make the same calculation solely for “end products” – fully manufactured goods – which tend to be the focus of misgiving about the state of Canadian industry. Nonetheless, a fair proxy is the ratio of exports to imports, whose behaviour naturally mirrors the shipments/ADA performance in broad outlines. (For manufacturing as a whole that ratio stayed within the bounds 80 to 105 per cent over the years in question, with no discernible systematic movement up or down through the period.) The sectors representing only end products experienced a climb in the ratio from 15 to around 60 per cent in the 1960s, but from 1968 to the early 1980s the numbers remained consistently between 50 and 60 per cent, again with no evidence of systematic movement one way or the other (see Table 4-5). The increase in the late-1960s reflects the results of the Canada-U.S. auto pact, and the subsequent stability of this indicator suggests that Canadian fully manufactured goods did not lose ground in relative competitive position – that is, relative to other sectors' products – up to the early 1980s.

Table 4-5**Ratio of Exports to Imports of End Products,¹ 1960-81**

	Exports	Imports	Ratio
	(\$ Millions)		(Per cent)
1960	411	2,718	15.1
1961	506	2,880	17.6
1962	655	3,151	20.8
1963	779	3,172	24.6
1964	1,109	3,701	30.0
1965	1,300	4,476	29.0
1966	2,137	5,570	38.4
1967	3,116	6,465	48.2
1968	4,352	7,620	57.1
1969	5,318	8,885	59.9
1970	5,551	8,618	64.4
1971	6,193	9,832	63.0
1972	7,136	11,948	59.7
1973	8,386	14,798	56.7
1974	9,236	18,362	50.3
1975	10,473	20,679	50.6
1976	12,711	22,826	55.9
1977	15,231	26,321	57.9
1978	18,855	31,304	60.2
1979	20,924	38,074	55.0
1980	21,850	39,656	55.1
1981	25,351	46,237	54.8

¹ The Statistics Canada category “end products, inedible” – i.e., fully manufactured nonagricultural products.

SOURCE Statistics Canada, *Trade of Canada*, various issues.

5 ...With Its Cost/Price Performance Out of Line...?

Behaviour of Canadian and Foreign Prices

Given the foregoing indications that Canadian manufacturing has held its relative position in respect of competitiveness as against other sectors, it is useful to examine the performance of relevant prices at home and abroad by way of confirmation. In what follows we have borrowed heavily from work originating in the Economic Intelligence Branch of the Department of Regional Industrial Expansion (formerly Industry, Trade and Commerce), as noted in the preface.¹ We should also mention here the very considerable reference we have made to valuable international analyses by the Bureau of International Labor Affairs of the U.S. Department of Labor.

A possible approach to the matter of competitiveness is to evaluate the behaviour of Canadian and foreign product prices, in aggregate, in each other's markets. That is to say, one needs to examine two sets of relationships: first, the changes in export prices of Canada's manufactures in comparison with the changes in domestic prices of foreign manufactures in those foreign countries' home markets; and second, the changes in domestic prices of Canada's manufactures here in Canada as against the changes in landed prices of foreign manufactures in our market. The former of these comparisons will give an impression of the competitiveness of Canadian goods abroad, while the latter will indicate how competitive our products are relative to foreign products imported into Canada. As we have noted already, both economic theory and practical observation suggest that these figures are bound to match one another overall, and the preceding analysis would appear to confirm that. Nevertheless, in light of the widespread misunderstanding and skepticism on these matters it can be useful to offer a further cross-reference.

Table 5-1 provides the first comparison, in respect to ten of this country's most important foreign markets, for the period 1960-81. It is somewhat less than perfect in that the categories of goods contained in each country's classification "manufactured products" are not identical, and there are other technical deficiencies as shown in a footnote. Even so, this is a reasonably sound approximation of the behaviour of relevant prices, and what it reveals is reassuring. Apart from

the years 1965-70, the prices of Canada's manufactured exports rose less than the domestic prices of our main competitors' manufactured goods in their own markets (also calculated in U.S. dollars to correct for exchange-rate changes). In measurements such as these there is a danger of biases deriving from the reduction or elimination of exports whose prices in fact got out of line. Nevertheless, there is little evidence that economic forces in any way prevented Canadian manufacturers from maintaining the necessary equilibrium, in terms of price, in these markets abroad over the two decades.

No country breakdown is readily available in respect of the prices of foreign goods in the Canadian market, and Table 5-2 thus compares changes in domestic manufacturers' prices with those in the prices of imported manufactures as a whole. There is essentially no difference in the behaviour of these two series over the total twenty-year time-frame; one figure leads the other during the initial five-year subperiod, but the pendulum moves in the opposite direction for the subsequent two five-year spans, and it then bounces back again at the finish. What this means is that Canadian goods have apparently been able to match the prices of imported goods pretty evenly during the twenty years covered. Under a regime of exchange-rate flexibility, poor competitiveness relative to other Canadian sectors would have made that very difficult.

Despite their shortcomings, the data therefore plainly underscore the stability of the overall competitive position of manufactured goods on price; and the story they tell is confirmed by other comparisons of aggregate Canadian and foreign price performance, from such measures as consumer price indexes and export unit values, developed by international agencies (see Tables A-1 and A-2). According to such figures, Canada does not seem to be "deindustrializing."

Nonetheless, this is only the first step in an appraisal of the viability of Canadian manufacturing in the face of a more challenging international trading environment.

Wages, Productivity, and Other Measures

If prices are the ultimate determinant of a country's ability to compete internationally as a producer of

Table 5-1

Changes in Canadian Manufactured Goods Export Prices Compared to Those in Prices of Domestic Manufactures in Ten Major Foreign Markets

	Compound annual rates of change				
	1960-65	1965-70	1970-75	1975-81	1960-81
	(Per cent)				
Canadian manufactured goods Export prices (U.S.\$):					
Canadian definition ¹	-1.1	3.6	9.0	10.0	5.4
United Nations definition	-1.0	3.8	7.4	7.2	4.4
Foreign domestic manufactured goods prices National currencies ² :					
Belgium	1.2	2.1	6.8	4.5	3.7
France	2.7	3.4	8.3	8.4	5.8
West Germany	1.3	0.7	6.3	15.3	6.2
Italy	1.8	3.9	13.9	15.6	8.9
Japan	0.2	1.9	8.4	4.2	3.7
The Netherlands	2.2	2.2	2.8	7.5	3.8
Sweden	3.2	2.9	9.9	9.6	6.5
Switzerland	2.3	1.5	6.3	1.6	2.8
United Kingdom	2.6	3.7	13.4	13.9	8.5
United States	0.4	2.7	9.6	9.0	5.5
Foreign domestic manufacturing prices (U.S.\$):					
Belgium	1.2	2.1	13.6	4.3	5.1
France	2.7	1.0	14.1	4.2	5.3
West Germany	2.3	2.5	15.1	16.9	9.3
Italy	1.8	3.9	12.9	5.4	5.9
Japan	0.2	1.9	12.7	9.5	6.1
The Netherlands	3.2	2.2	10.4	7.8	5.9
Sweden	3.2	2.9	9.9	9.6	6.5
Switzerland	2.3	1.5	6.3	1.6	2.8
United Kingdom	2.6	3.7	13.4	13.9	8.5
United States	0.4	2.7	9.6	9.0	5.5
Weighted average ³	0.9	2.8	10.4	9.5	5.8

1 The base-weighted price deflator for inedible end products plus inedible fabricated materials. (This is the same series used by the United Nations prior to 1975 but using a different weighting scheme).

2 For Belgium, France and Japan, industrial products; for West Germany, the price index for industrial products from 1970, the general price index prior to 1970; for Italy, producers' goods; for Sweden, producers' goods from 1970 and the general wholesale price index prior to 1970; for the Netherlands, producers' goods; for the United Kingdom, finished goods; for Switzerland, domestic goods; and for the United States, general goods.

3 Aggregated using 1970 Canadian trade weights.

SOURCE United Nations, *Monthly Bulletin of Statistics* (New York: United Nations, various issues).

Table 5-2

Changes in Prices of Manufactured Goods Imports Compared to Those in Prices of Canadian Domestic Manufactures, 1960-80

	Compound annual rates of change				
	1960-65	1965-70	1970-75	1975-80	1960-80
	(Per cent)				
Prices of imports	2.7	1.6	7.8	11.2	5.5
Prices of domestic goods ¹	1.0	2.6	9.6	10.0	5.8

1 All items industry selling price index (ISPI).

SOURCE Statistics Canada.

manufactured goods as opposed to primary commodities and service outputs, they are not necessarily an accurate measure of that country's industrial efficiency. Prices are established by producers in order to make sales, and on occasion they have to be set so low as to leave little or no profit, which is obviously not a sustainable position. Firms in smaller trading nations such as Canada may quite often find themselves unable to be other than "price-takers"; although ultimately those that cannot cope with such a situation will drop out of the market and thus influence the relevant statistical evidence, this can take a rather long time. In any event, there are a number of reasons why it can be advisable to investigate some other *ex post* indicators of relative competitiveness besides price alone. And the most crucial ones are, of course, those that evaluate producers' costs.

Unfortunately, although a complete estimation of costs should include more than just the cost of labour, data on other factors are hard to find in a form suitable for international comparison. But labour is usually the biggest cost item, especially in manufacturing, and so assessing changes in that item as between Canada and other countries offers a good prospect of demonstrating how Canadian manufacturing industry has been placed to compete in the world – once again, always subject to the equilibrating exchange-rate factor referred to earlier.

Labour cost per unit of output is made up of two elements: compensation per man-hour (wages and salaries) and output per man-hour (labour productivity). U.S. Department of Labor material in Table 5-3 shows how increases in the remuneration of Canadian manufacturing workers over the years 1960-81 compared with the pay gains of employees in manufacturing in ten other important industrial nations. Table 5-4 provides data on changes in labour productivity as between the same eleven countries. The problems of such comparisons, as already outlined, reduce their usefulness as practical tools of analysis. Nevertheless, it seems fair to infer from the material that a slow rate of improvement in both compensation and output per man-hour has characterized Canadian manufacturing over virtually the entire period.

And here, of course, we come to the essence of what makes a sector or an industry competitive. So far as the ability to compete is concerned, slow rates of improvement in compensation are a help, while the opposite is true of poor productivity gains. Thus it is of substantial potential interest that the Canadian figures on either count are exceeded by those of all the continental European nations and Japan throughout the whole twenty-one-year time-span, save for minor exceptions for subperiods in one or two cases. Only the United States fell below the Canadian standings, consistently recording inferior results in both series

Table 5-3

Changes in Hourly Compensation in Manufacturing, Canada and Ten Other Industrial Countries, Based on National Currencies, 1960-81

	Rates of change ¹			
	1960-73	1973-80	1980-81	1960-81
	(Per cent)			
Belgium	10.7	12.0	8.1	12.6
Canada	6.4	11.9	11.1	8.7
Denmark	11.8	13.1	9.3	13.2
France	9.3	15.2	15.0	11.9
West Germany	9.3	9.7	7.4	10.1
Italy	12.3	20.1	22.1	16.2
Japan	14.6	10.5	6.9	14.8
The Netherlands	12.8	10.6	4.8	12.9
Sweden	10.4	13.8	12.6	12.0
United Kingdom	8.6	19.1	16.1	13.1
United States	5.0	9.3	10.3	6.9

¹ Computed from the least squares trend of the logarithm of the index numbers.

SOURCE U.S. Department of Labor, Bureau of Labor Statistics. (Reproduced in Patricia Capdevielle, Donato Alvarez, and Brian Cooper, "International Trends in Productivity and Labor Costs," *Monthly Labor Review*, U.S. Department of Labor, Washington, December 1981 and December 1982).

Table 5-4

Changes in Output Per Man-Hour in Manufacturing, Canada and Ten Other Industrial Countries, 1960-81

	Rates of change ¹			
	1960-73	1973-80	1980-81	1960-81
	(Per cent)			
Belgium	7.0	6.2	5.6	7.2
Canada	4.5	2.2	0.8	3.6
Denmark	6.4	5.1	5.6	6.1
France	6.0	4.9	1.6	5.5
West Germany	5.5	4.8	2.7	5.2
Italy	6.9	3.6	3.5	5.8
Japan	10.7	6.8	0.8	9.2
The Netherlands	7.6	5.6	2.6	7.1
Sweden	6.7	2.1	0.1	5.0
United Kingdom	4.3	1.9	5.7	3.6
United States	3.0	1.7	2.9	2.7

¹ Computed from the least squares trend of the logarithm of the index numbers.

SOURCE U.S. Department of Labor, Bureau of Labor Statistics. (Reproduced in Patricia Capdevielle, Donato Alvarez, and Brian Cooper, "International Trends in Productivity and Labor Costs," *Monthly Labor Review*, U.S. Department of Labor, Washington, December 1981 and December 1982).

(except for output per man-hour in 1980-81). However, the British, too, contrived an unfortunate performance in these respects: they showed superior wage increases to Canada's along with barely comparable productivity gains, which is obviously an undesirable combination.

The results of the two influences on unit labour costs appear in Table 5-5, which shows them on a national currency basis (that is, without allowance for exchange-rate changes) and on a common U.S. dollar basis (reflecting amendments in currency par values) in the upper and lower sections of the tabulation. These numbers reveal the extent to which Canadian workers' relatively poor rates of wage and salary increase were necessary, in the face of undistinguished

rates of productivity improvement, to hold down the pace of advance in unit labour costs. In national currency comparisons, only the United States and West Germany managed to keep the rise in their labour costs per unit of output below Canada's over the whole 1960-81 period (although some others did so for particular subperiods during that time). When allowance is made for changes in the external value of the Canadian dollar, Canada is shown as having by far the lowest rate of increase in unit labour costs except for the United States over the total period. Over the long term Canada's labour-cost standing shows the expected competitive viability internationally, given its prevailing mix of productivity and wage-rate performance through the whole period.

Table 5-5

Changes in Unit Labour Costs in Manufacturing, Canada and Ten Other Industrial Countries, 1960-81

	Rates of change ¹			
	1960-73	1973-80	1980-81	1960-81
	(Per cent)			
National currency basis:				
Belgium	3.5	5.5	2.4	5.1
Canada	1.8	9.5	10.3	4.8
Denmark	5.1	7.6	3.5	6.8
France	3.1	9.9	13.2	6.1
West Germany	3.7	4.7	4.6	4.6
Italy	5.1	16.0	18.0	9.8
Japan	3.5	3.4	6.1	5.1
The Netherlands	4.8	4.8	2.1	5.5
Sweden	3.5	11.2	12.5	6.7
United Kingdom	4.1	17.2	9.9	9.2
United States	1.9	7.5	7.2	4.1
U.S. dollar basis:				
Belgium	4.6	10.6	-19.3	7.8
Canada	1.9	6.4	7.5	4.4
Denmark	5.0	9.3	-18.0	7.9
France	2.8	10.9	-11.6	6.5
West Germany	6.1	11.2	-15.8	9.1
Italy	5.4	9.6	-10.8	7.6
Japan	4.9	8.3	8.8	7.9
The Netherlands	6.1	10.3	-18.5	8.7
Sweden	4.2	11.3	-5.5	7.7
United Kingdom	2.6	15.3	-4.4	7.1
United States	1.9	7.5	7.2	4.1

¹ Computed from the least squares trend of the logarithm of the index numbers.

SOURCE U.S. Department of Labor, Bureau of Labor Statistics. (Reproduced in Patricia Capdevielle, Donato Alvarez, and Brian Cooper, "International Trends in Productivity and Labor Costs," *Monthly Labor Review*, U.S. Department of Labor, Washington, December 1981 and December 1982).

Further Elaborating the Measurement

The U.S. Department of Labor has attempted to gauge these competitive factors more appropriately in an additional series that, for each of the eleven countries, indexes the position in respect of productivity, average compensation, and thus unit labour costs vis-à-vis the other ten according to their relative importance as trading partners. That is to say, since any nation's ability to survive and prosper in international markets depends on its competitive capacity in those spheres that are most challenged by other countries' goods, a great deal more significance must attach to cost performance in comparison with its major trade partners and the world's big traders generally than to that relative to smaller trading entities. For Canada, obviously, it is vital to keep manufacturers' relative costs in line with corresponding levels in the United States, simply because of the scale of bilateral Canada-U.S. trade, while our situation in respect to European and Japanese costs is less crucial so long as these patterns of commerce remain broadly unchanged. The Department of Labor has endeavoured, in its series, not only to reflect the differing strengths of bilateral relationships but also to take some account of the potential of each country's trading partners as competitors in third markets – essentially by including in its calculations a measure of total manufacturing trade volumes.

Table 5-6 shows, on the basis of the trade-weighting system described, how costs in Canadian manufacturing behaved as compared with the other ten competitor countries between 1960 and 1981. It will be seen that on the whole the figures remain fairly close to 100 throughout, which means that the ranking of Canada as regards output per man-hour, hourly compensation, and unit labour costs stayed over the two decades in roughly the same relationship to its competitors that it had at the start of the period. Examined in detail,

Table 5-6

Relative Indexes of Output Per Man-Hour, Hourly Compensation and Unit Labour Costs in Canadian Manufacturing, 1960-81¹

	Output per man-hour	Hourly compensation	Unit labour costs	
			Canadian dollars	U.S. dollars
			(1970=100)	
1960	94.0	103.6	110.2	118.3
1961	95.8	101.5	106.0	108.7
1962	96.4	99.0	102.7	99.8
1963	93.7	98.3	104.9	101.0
1964	92.6	96.9	104.6	100.7
1965	92.6	97.9	105.6	101.8
1966	93.8	100.1	106.7	102.9
1967	95.1	102.0	107.2	103.3
1968	96.9	101.5	104.7	101.7
1969	99.6	101.1	101.5	98.6
1970	100.0	100.0	100.0	100.0
1971	101.2	99.8	98.6	101.3
1972	100.0	99.9	99.9	102.6
1973	100.3	100.7	100.4	99.9
1974	103.6	103.0	99.4	102.1
1975	98.4	103.5	105.2	103.3
1976	98.7	108.4	109.9	113.5
1977	99.8	110.4	110.6	105.2
1978	99.8	108.2	108.4	93.4
1979	100.8	108.4	107.5	89.1
1980	97.7	106.5	109.0	90.2
1981	95.8	107.1	111.8	93.5

¹ These indexes are explained in the text. Basically they are calculated from the ratio of the relevant Canadian indexes to a trade-weighted average index for the other ten countries listed in Tables 5-3 to 5-5. Thus wherever any figure diverges from 100.0 it means that in the year concerned the Canadian position differed to that extent from the relationship it held vis-à-vis these trading partners in 1970. (See Table A-3).

SOURCE U.S. Department of Labor, Bureau of Labor Statistics. (Reproduced in Patricia Capdevielle, Donato Alvarez, and Brian Cooper, "International Trends in Productivity and Labor Costs," *Monthly Labor Review*, U.S. Department of Labor, Washington, December 1981 and December 1982).

however, the data illustrate a weakness in productivity improvement, relative to other countries, over the years since 1979 (essentially due to the severity of the recession) and an out-of-line increase in labour compensation during the mid-1970s. These effects gave rise to a measurable worsening in the unit-labour-cost standing of Canadian manufacturing, expressed in Canadian dollars, in the period 1974-77 and again 1979-81; exchange rate changes accentuated the first of those developments but mitigated the second.

Chart 5-1 plots the shifts in Canadian unit labour costs and competitor countries' unit labour costs for 1970-81, both expressed in U.S. dollars, with the ratio between the two. These indicators confirm the earlier figures, which is no surprise, and they also reinforce the general evidence that Canada has displayed less growth in labour productivity and remuneration than other advanced nations except the United States, keeping unit labour costs in line because these two elements have necessarily offset each other rather exactly. The sole example of slippage in that equilibrium occurred in the last year or two of the figures

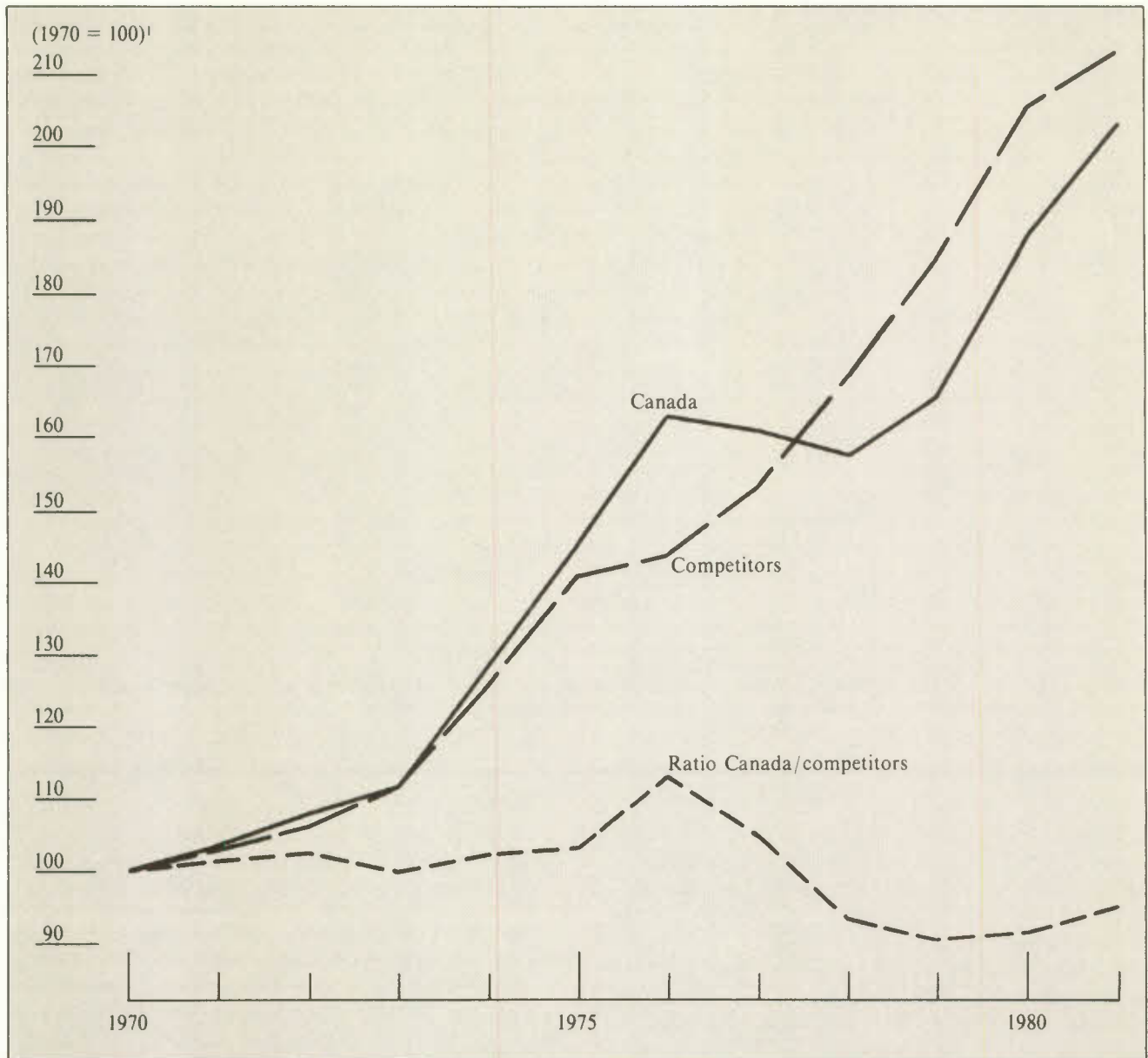
once more, but it is not clear at this point what if anything one may deduce from such an aberration.

The full U.S. Department of Labor series is reproduced in Table A-3, which reveals the different experience of the United States, Japan, West Germany, and the Low Countries, on the one hand, and Italy and the United Kingdom, on the other. According to these measures, manufacturers in the first-named countries considerably improved their unit-labour-cost standing against competitor nations (although presumably not primarily against Canada) over the 1970-81 period, while the standing of the other two deteriorated. For Japan, West Germany, and Italy, however, these positions were greatly altered by exchange-rate changes since the mid-1970s, which helps to illustrate the shortcomings of all such evaluations.

In a word, the behaviour of Canadian manufacturers' unit labour costs, which are the main element in their overall unit costs, has on the face of things compared favourably over the past twenty years with

Chart 5-1

Unit Labour Costs, Canada and Ten Major Competitor Countries, 1970-81



1 Trade-weighted index based on conversion to U.S. dollars.
 SOURCE U.S. Department of Labor, Bureau of Labor Statistics, derived from source shown for Table 5-3 and other BLS data.

that of our principal trading partners – especially our overseas trading partners – essentially because labour compensation has kept roughly in step with the very poor productivity performance. As in the analysis of prices, the assessment again confirms what one would assume to be the case in respect to the capacity of Canada’s secondary industry to hold its own against foreign competition in both home and export markets:

Canadian costs parallel those abroad because they must, but those in manufacturing have been as competitive as in other sectors.

Absolute Cost Levels

One hardly needs to observe that it would be helpful, in the appraisal of competitive position, if in addition

to measures of cost changes among countries there were also available international comparisons of the relative level of unit production costs in manufacturing – and perhaps the relative level of unit transportation, distribution, and selling costs in that sector also – expressed by some yardstick of genuine competitive parity. It may be inferred from an analysis of cost changes such as the foregoing that Canadian competitiveness in manufacturing, viewed in the context of equilibrating exchange rates, has approximately held steady; and, since Table 4-1 indicates a relative performance of the manufacturing sector at least no worse than the other Canadian sectors, it is reasonable to judge that with reduced tariff protection the efficiency shortcomings discussed earlier have to some degree lessened. But a more satisfying conclusion along these lines could be derived if we had directly comparable figures on labour compensation and output per man-hour, etc., in some standard measure of straight comparability, year by year for Canada and each of its major trading partners.

However, the development of such a perfect guidepost to competitive standing is probably beyond the capacity of current tools of analysis. Table 5-7 reproduces a U.S. Department of Labor estimate of hourly compensation of production workers in manufacturing in ten industrial countries, including Canada. It could be criticized on many grounds, since the systems of employee benefits are very different around the world, and of course exchange-rate differences crucially affect comparability, but nevertheless it is

illuminating since it purports to show the extent to which Canadian wages and benefits as of the early 1980s were lower than those paid in most European nations as well as in the United States. Apparently manufacturing production workers in Belgium, West Germany, The Netherlands, Sweden, and the United States were at that time better rewarded than their opposite numbers in Canada, while French workers' remuneration was almost as high and that of Italians seemed to be moving ahead. However, events since then – mainly realignments in exchange rates – moved the situation back, according to available data, over the following two years to something like its earlier hierarchy, with U.S. pay and benefits the highest and Canadian second.² The artificiality of exchange-rate levels in terms of real competitive equivalence really renders these figures rather valueless for our purposes – although they are useful in showing the actual conditions of the market faced by those active in world trade.

In respect of labour productivity, there is little in the way of serious international comparative analysis. An attempt to establish differences in productivity levels between Canada and the United States alone was carried out by Frank for The Conference Board of Canada in 1977, and it gives the best relatively recent evidence on Canadian levels of output (value added) per man-hour in manufacturing as against the all-important U.S. competitor.³ Although the work was limited to a sample of 33 industries, that is a large enough number to be probably fairly representative of

Table 5-7

Estimated Hourly Compensation of Production Workers in Manufacturing, Canada and Nine Other Industrial Countries, Selected Years, 1960 to 1981

	1960	1965	1970	1975	1976	1977	1978	1979	1980	1981
	(U.S. dollars)									
Belgium	0.82	1.29	2.06	6.54	7.03	8.46	10.39	12.02	13.18	11.10
Canada	2.13	2.28	3.46	6.11	7.20	7.55	7.69	8.16	8.98	9.87
France	0.82	1.23	1.72	4.58	4.76	5.31	6.54	7.90	9.24	8.32
West Germany	0.85	1.40	2.33	6.19	6.60	7.80	9.65	11.26	12.30	10.54
Italy	0.62	1.11	1.74	4.60	4.38	5.08	6.09	7.20	8.17	7.48
Japan	0.26	0.48	0.99	3.05	3.30	4.03	5.54	5.49	5.61	6.18
The Netherlands	0.68	1.23	2.12	6.56	7.02	8.19	9.98	11.47	12.15	10.02
Sweden	1.20	1.87	2.93	7.18	8.25	8.88	9.65	11.33	12.51	11.80
United Kingdom	0.84	1.15	1.49	3.26	3.12	3.35	4.28	5.49	7.29	7.12
United States	2.66	3.14	4.18	6.35	6.93	7.59	8.30	9.07	9.91	10.98

Note Total hourly compensation includes all direct payments made to the worker (pay for time worked, pay for vacations and other leave, all bonuses and pay in kind before payroll deductions of any kind). It also includes "fringes benefits" such as employer expenditures for social security, insurance, etc. The information is derived from periodic labour cost surveys prorated for intervening years. Small differences in compensation levels should not be considered significant.

SOURCE U.S. Department of Labor, Bureau of Labor Statistics. (Reproduced in Patricia Capdevielle, Donato Alvarez, and Brian Cooper, "International Trends in Productivity and Labor Costs," *Monthly Labor Review*, U.S. Department of Labor, Washington, December 1981 and December 1982).

the entire manufacturing sector. The study, which covered the years 1967 to 1974, revealed (see Table 5-8) a considerable difference among the main categories of industries both in respect of the discrepancy with U.S. levels of productivity and as regards the alteration in that discrepancy from the start of the analysis to the end. Those characteristics are themselves interesting, since they indicate the continuing presence in the economy of industries that are very inefficient compared with their U.S. equivalents, alongside others that are well up to American standards of efficiency. But the broad trend demonstrated by these figures was of rapid shrinking of the Canada-U.S. labour productivity gap, the average Canadian productivity level rising from about 65 per cent of the American figure in 1967 to approximately 80 per cent in 1974.

Here, though, one should juxtapose Frank's findings and the data in Table 5-6, which suggest that 1974 was a year in which the improvement in Canadian productivity compared to other countries was especially pronounced. One is led to believe that the Canada-U.S. differential widened again quite markedly in 1975 and then remained stable until 1979 at a level just slightly inferior that of the early 1970s but better than that of the late 1960s;⁴ and it seems to have slipped again in the early 1980s.

Even so, if one looks at the evidence on productivity together with that on labour compensation, it underlines the impression given in Table 4-1 – that is, of an ability of Canadian manufacturing to survive at home and obtain sales abroad, so as to keep its pre-existing relative position vis-à-vis other domestic industries, despite a decline in import protection. None of these data are in any sense conclusive – for, as mentioned earlier, there are many difficulties in such measurements – but cumulatively they tell a fairly persuasive story. Within the terms of our analytical method, the relative competitiveness of Canadian manufacturing seems good.

It should be stressed once again, however, that this is an evaluation of the capacity of Canadian secondary industry to match other sectors' competitiveness in foreign markets (and ability to cope with imports in home markets), not a reflection of contentment with

Table 5-8
Estimate of Canadian Productivity Levels as a Percentage of Those in United States, by Major Industry Group, 1967 and 1974¹

	Canadian prices		U.S. prices	
	1967	1974	1967	1974
	(Per cent)			
Nondurable goods	53	68	61	70
Food processing	72	69	73	78
Textiles, clothing and knitting	70	83	90	90
Paper products	76	77	99	88
Petroleum refining	37	70	25	55
Miscellaneous	44	53	29	50
Durable goods	73	94	70	98
Wood products	111	117	117	147
Metal products	70	93	71	96
Motor vehicles and parts	77	100	61	93
Miscellaneous	60	68	60	65
Total sample	62	77	65	82

¹ Productivity is measured by value added per man-hour. Value added is defined as the value of output less the value of purchased inputs, each valued on the basis of 1972 price indices. The two sets of columns represent the effect of independently using U.S. and Canadian price indices.

SOURCE: James G. Frank, *Assessing Trends in Canada's Competitive Position: The Case of Canada and the United States* (Ottawa: The Conference Board of Canada, 1977), p. 66.

manufacturing productivity, which has certainly failed to perform adequately. We are essentially concerned with the evidence of adjustment by Canada's manufacturing sector to a new and more open international trading situation – with whether the sector as a whole has declined or whether what has happened has been an internal redeployment. We take it that a continuing alignment of costs and prices with those of other countries' producers, while the relative status of manufacturing in the Canadian economy has stayed the same, implies a successful ongoing adjustment process; "deindustrialization" does not appear to have occurred. Let us now consider the structural redeployment question.

6 ...Or Is There a Structural Problem?

Gainers vs. Losers: A Sectorial Analysis

If the manufacturing sector as a whole has been able to hold its own vis-à-vis other Canadian sectors in a world of decreasing protection, that does not at all mean that individual industries and products need have done uniformly well. On the contrary, the *prima facie* assumption about trade liberalization is that it will give rise to gainers and losers. While the notion that secondary industry is not *in toto* a loser must be reassuring to Canadians, they are bound to have many misgivings about the structure of manufacturing that emerges from a process of multilateral cuts in import duties. A sectorial analysis is therefore the next step to be taken in seeking to ascertain whether Canada is in some sense retrogressing from the position of advanced industrial country that it achieved over the years during and after the Second World War.

Such an analysis is possible by reference to detailed product-by-product data on import-penetration and export-orientation ratios of the kind referred to earlier in dealing with the overall relative competitiveness of Canadian manufacturing. The Department of Regional Industrial Expansion has used the SIC (Standard Industrial Classification) breakdown to develop a series that provides these ratios, over the period from the mid 1960s, for approximately 100 categories and 50 subcategories of manufactures in the twenty industrial sectors. Using subcategories rather than main categories where available gives us 130 lines of activity whose "good health" or "ill health" can best be measured by observing the behaviour over time of the ratio of domestic shipments to apparent domestic availability (see Table A-4). It turns out that during the years from the mid-1960s to 1980 this ratio increased in twenty-two cases (and probably in four more) and declined in thirty-eight (with two probables). Since the ratio for manufacturing in total remained constant, it necessarily follows that the twenty-five or so instances of improvement on average involved much larger amounts than were entailed in the forty-odd cases of deterioration. (In terms of the value of domestic shipments in 1980, the total for the gainers in fact far outstripped that for the losers, as seen in Table 6-1. The balance of some sixty-five items showed neither gain nor loss (allowing for minor fluctuations within this period) in the shipments/ADA ratio over the fifteen years.

Perhaps the most interesting thing about these increases and declines is how rarely a gain in the shipments/ADA situation can be adduced, even in part, to a fall-off in foreign competition or, likewise, how unusual it is that a drop in the shipments/ADA ratio can be wholly or partly attributed to a slippage in Canada's export performance. Of the twenty-six instances of improvement and probable improvement in the shipments/ADA standing, only six witnessed a decrease in the ratio of imports to ADA, whereas this latter ratio remained unchanged in five cases and actually rose in fifteen. Similarly, of the forty where the shipments/ADA proportion sank or probably sank over the years, just six experienced a weakening in the export-shipments percentage, against nineteen where that ratio held steady and fifteen where it actually climbed. That is to say, when Canadian "implied self-sufficiency" clearly strengthened, it is in the majority of cases because there was an increase in exports of such strength as to outweigh the simultaneous growth that nevertheless occurred in foreign penetration of the domestic market. Similarly, when Canadian performance in this regard can be seen to have worsened, it is most commonly by virtue of an expansion of imports great enough to offset – and more – the coincident improvement that even so took place in the success of our own exporters abroad.

Moreover, of the sixty-four categories where the shipments/ADA ratio remained essentially unchanged over the period covered, twenty-four were characterized by coincident expansion of both imports/ADA and exports/shipments; in other words, the stability in Canada's relative position in these cases masked increases in both Canadian orientation toward foreign markets and foreign penetration of our own market. Such behaviour reflects the fact that any disaggregation of industry is incomplete: within each category and subcategory there are numerous lines of products with varying characteristics in respect of competitiveness, so that an overall evaluation is necessarily capturing only the net effects.

Thus the interdependence revealed in the general appraisal of manufacturing's status is further emphasized by sectorial analysis. These patterns mean that international specialization is bringing about different results for individual classes of goods within product categories. Canada is often losing ground to imports of particular goods in a product category while it is

Table 6-1

Gainers and Losers in the Shipments/ADA Ratio over the Period 1966-80, by Main Sector, and Value of Shipments in 1980

	1980 shipments (\$ Millions)
Gainers:	
Textile industries	
Carpet, mat, and rug industry	651
*Miscellaneous textile industries, n.e.s.	638
Clothing industries	
Fur goods industry ¹	221
Wood industries	
Sawmills, planing mills, and shingle mills ²	4,921
*Sash, door, and other millwork plants, n.e.s. ³	813
Miscellaneous wood industries ¹	395
Furniture and fixture industries	
Office furniture manufacturers	383
Miscellaneous furniture and fixture manufacturers ³	554
Paper and allied industries	
Pulp and paper mills ²	10,998
Asphalt roofing manufacturers	241
Miscellaneous paper converters ³	1,170
Primary metal industries	
Iron foundries ³	465
Metal fabricating industries	
Wire and wire product manufacturers	1,459
Transportation equipment industries	
Truck body and trailer manufacturers	973
Shipbuilding and repair ¹	1,019
Nonmetallic mineral products industries	
Cement manufacturers	623
Concrete product manufacturers	621
Lime manufacturers ¹	94
*Miscellaneous nonmetallic mineral product industries, n.e.s.	657
Petroleum and coal product industries	
*Petroleum refining	14,522
*Manufacturers of lubricating oils and greases	220
Miscellaneous petroleum and coal product industries ²	109
Chemical and chemical products industries	
Manufacturers of mixed fertilizers ²	186
Manufacturers of plastics and synthetic resins	1,182
Manufacturers of industrial chemicals ¹	4,575
Miscellaneous manufacturing industries	
Signs and display industry	197
All gainers	47,887
Losers:	
Food and beverage industries	
*Miscellaneous food processors, n.e.s.	2,798
*Distilleries ¹	756
*Wineries	161
Leather industries	
Leather tanneries	196
Shoe factories	624
Leather glove factories	36
*Miscellaneous leather product manufacturers	164

Table 6-1 (concl'd.)

	1980 shipments
Textile industries	
Man-made fibre, yarn, and cloth mills	1,282
Cordage and twine industry	29
Cotton and jute bag manufacturers	144
*Narrow fabric mills	77
Knitting mills	
Hosiery mills	190
Knitting mills (except hosiery mills)	718
Clothing industries	
Men's, women's, and children's clothing industries	3,204
Foundation garment industry	97
*Fabric glove manufacturers	24
*Hat and cap industry	41
*Miscellaneous clothing industries, n.e.s. ¹	70
Wood industries	
Coffin and casket industry	34
Furniture and fixture industries	
Household furniture manufacturers	1,147
Primary metal industries	
Copper and copper alloy rolling, casting, and extruding ¹	595
Electrical product industries	
Manufacturers of small electrical appliances	268
Manufacturers of household radio and television receivers	250
Communications equipment manufacturers ^{1, 3}	2,316
Manufacturers of electrical industrial equipment ³	1,575
Manufacturers of electric wire and cable	1,112
*Battery manufacturers	243
*Manufacturers of miscellaneous electrical products, n.e.s.	684
Nonmetallic mineral product industries	
Clay product manufacturers	201
Abrasives manufacturers ²	191
Chemical and chemical product industries	
Paint and varnish manufacturers	714
Manufacturers of toilet preparations	492
Miscellaneous chemical industries	1,588
Miscellaneous manufacturing industries	
*Instrument and related product manufacturers ²	927
*Clock and watch manufacturers	118
*Orthopaedic and surgical appliance manufacturers	118
*Ophthalmic goods manufacturers	107
*Toy and game manufacturers	271
*Broom, brush, and mop manufacturers	76
*Pen and pencil manufacturers	62
All losers	23,700

*Subcategories; the main categories have been omitted in these cases to avoid double counting.

1 Products of which Canada is a substantial exporter; the ratio of exports to shipments averages over 20 per cent.

2 Products of which Canada is a very substantial exporter; the ratio of exports to shipments averages over 50 per cent.

3 Cases where the trend is not certain because of wide fluctuations recorded over the period.

SOURCE See Table A-4.

gaining at home and abroad in that category in aggregate; and it is frequently gaining sales in other countries in particular goods within a category while losing its position relative to the total market in the category overall.

Interpreting the Pattern

What is the pattern of gainers and losers, and what does it tell us? As Table 6-1 shows, by main sector the gainers are categories in textile products (2), clothing (1), wood products (3), furniture and fixtures (2), paper products (3), primary metals (1), metal fabricating (1), transportation equipment (2), nonmetallic mineral products (4), petroleum and coal products (3), chemicals (3), and miscellaneous (1). Almost a third of these categories are ones in which Canada has habitually been a substantial exporter (and nearly a half of those are ones in which we have consistently been a very substantial exporter). The losers are categories in foods and beverages (3), leather products (4), textile products (4), knitted goods (2), clothing (5), wood products (1), furniture and fixtures (1), primary metal industries (1), electrical products (7), nonmetallic mineral products (2), chemical products (3), and miscellaneous (7). Less than one-sixth of these are categories in which Canada has customarily been a substantial exporter (and only a third of those are ones in which we have normally been a very substantial exporter). Although there are several major exceptions, one can see in these findings some broad association between gaining categories and primary resource orientation – that is, a linkage to the areas of traditional Canadian trading strength – and between losing categories and remoteness from the resource base.

On the whole, then, the categories of gain are ones that have long been among the stronger industries in Canada, capable of securing export markets, while the categories of loss are in general those that have been for years typically confined largely to domestic sales. Indeed, the great majority of the losers are items in which Canada has tended traditionally to be a net importer. Trade liberalization, it seems, is serving to reinforce an existing competitive advantage and weaken the position of already uncompetitive sectors. Naturally, this is what is to be expected.

High-Technology Products

The only seemingly disturbing element in the evaluation so far – strictly in terms of relative competitiveness, that is, and leaving aside the broader productivity issue – concerns high-technology industries, tentatively isolated on the basis of some U.S. definitions (see Table 6-2). Of the fourteen categories so described, just two – industrial chemicals and plastics

and synthetic resins – are to be found in the gainers list, while seven are among the losers – three categories of electrical equipment and four specialized items (all subcategories of scientific and professional equipment) in the miscellaneous group. The remaining five are included in the fifty-five categories in which the shipments/ADA ratio did not perceptibly change over the years of the appraisal – although it is noteworthy that three of them were among those where the stability of that ratio masked considerable growth in both import penetration and export performance.

Table 6-2

Shipments by the High-Technology Industries, Canada, 1980¹

	1980 shipments
	(\$ Millions)
Machinery industries	
Miscellaneous machinery and equipment manufacturers	4,669
Office and store machinery manufacturers	800
Transportation equipment industries	
Aircraft and aircraft parts manufacturers	2,226
Electrical product industries	
Manufacturers of household radio and television receivers	250
Communications equipment manufacturers	2,316
Manufacturers of electrical industrial equipment	1,575
Chemical and chemical product industries	
Manufacturers of plastics and synthetic resins	1,182
Manufacturers of pharmaceuticals and medicines	1,198
Manufacturers of industrial chemicals	4,575
Miscellaneous manufacturing industries	
Instrument and related products manufacturers ²	927
Clock and watch manufacturers ²	118
Orthopaedic and surgical appliance manufacturers ²	118
Ophthalmic goods manufacturers ²	107
Sound recording and musical instrument manufacturers ²	120
Total	20,181

1 This is a tentative and very approximate list, using the categories in Table A-3.

2 Subcategories of larger categories.

SOURCE Based on Ministry of State for Science and Technology, *Canadian Trade in Technology-Intensive Manufacturers, 1964-76*, Background Paper 5 (Ottawa: MOSST, July 1978), using data from Department of Industry, Trade and Commerce, Economic Intelligence Branch, Economic Policy and Analysis.

Even among the losers in the high-technology products, Canada's weakness was not unequivocal in all cases. While the ratio of shipments to ADA dropped over the period in household radio and television receivers, communications equipment, orthopaedic and surgical appliances, and ophthalmic goods, Canadian exports as a proportion of shipments were still advancing in each of these categories; moreover, the same appeared to be true in electrical

industrial equipment and clocks and watches. The category of unqualified loss was instruments and related products, where the decline derived (although the trend is rather mixed) from a deterioration in the export position unaccompanied by significant change in import penetration.

One might note that the 1980 value of domestic factory shipments of industrial chemicals was more than \$4.5 billion and that of plastics and synthetic resins over \$1 billion, while the value of all seven of the high-technology losers together was \$5.4 billion, but this ought not in itself to mitigate any worries about the issue since the aggregations used are such as to give no more than a very rough idea of relevant magnitudes in all instances. More to the point is the finding of a 1978 study by the Ministry of State for Science and Technology, which identified high-technology industries in detail by reference to two definitions developed in the United States, on the one hand by the Department of Commerce and on the other by the National Science Foundation. The MOSST examination showed that, according to which of these two models was used, Canada's trade deficit in high-technology products increased between 1965 and 1976 from \$588 million to \$2,611 million or from \$1,826 million to \$6,461 million (see Table 6-3).

In truth those figures, like the ones for our trade deficit in all end products, appear less dramatic when expressed as a proportion of the trade flows themselves. On the DOC basis Canada's high-technology deficit showed an uncertain trend in the 1965-76

period; it rose from 34.2 to 38.0 per cent of the country's trade in these products, but it fell from 10.5 to 7.5 per cent of all end-products trade, and it remained constant at 3.5 per cent of total merchandise trade. On the NSF basis it went from 45.2 to 42.1 per cent in terms of the first of these measures, from 32.5 to 18.5 per cent in terms of the second, and from 10.9 to 8.6 per cent in terms of the third, all downward movements. That means that the trade deficit in high-technology products either dropped or remained more or less constant by these measures under either definition.

While unfortunately MOSST has not maintained its series up to the present, it has done some related work through to 1981 using a definition of high technology that is close to the wider of the two noted above. As Table 6-3 shows, this material indicates a continuation of the tendency described for the earlier period. Although the deficit in technology-intensive manufactures increased further to almost \$10 billion in 1981, as a proportion of the two-way trade in those kinds of goods it appears to have shrunk – as it has in relation to all end-products trade and total merchandise trade. Thus, on the face of things all that has happened is, at worst, the maintenance of a constant status in high-technology trade in relative terms. Canada has always imported more of these sorts of items than it has exported, and the situation on that score has certainly not deteriorated proportionally – and may even have improved somewhat – despite the growth in the absolute numbers on both the export and import sides. Again, such a situation does not seem too alarming.

Table 6-3

Canadian Trade in Technology-Intensive Products, Selected Years, 1965-81¹

	1965	1968	1971	1974	1976	1978	1980	1981
	(\$ Millions)							
Exports								
DOC-2	566	1,000	1,134	1,682	2,128	..	..	..
NSF	1,105	1,697	2,099	3,582	4,448	..	..	..
PRG	..	1,186	1,612	3,116	3,652	6,150	10,244	11,917
Imports								
DOC-2	1,154	1,860	2,288	4,390	4,739	..	..	..
NSF	2,931	3,940	4,861	9,407	10,909	..	..	..
PRG	..	3,232	4,124	8,098	9,564	12,993	18,869	21,472
Balance								
DOC-2	-588	-950	-1,154	-2,709	-2,611	..	..	..
NSF	-1,826	-2,243	-2,762	-5,825	-6,461	..	..	..
PRG	..	-2,046	-2,512	-4,982	-5,912	-6,843	-8,625	-9,555

¹ The three series are based on alternative definitions of high-technology industries:

DOC-2 is the second of two methods developed by the U.S. Department of Commerce;

NSF is an adaptation of U.S. National Science Foundation data;

PRG is a measure used by the Policy Research Group of MOSST in current work.

SOURCE: Ministry of State for Science and Technology, *Canadian Trade in Technology-Intensive Manufactures, 1964-76*, (Ottawa: Ministry of State for Science and Technology, 1978), p. 13; and Max Gassend, "Canada's International Trade Performance of Manufacturing Industries by Levels of Research Intensity," draft report, Ministry of State for Science and Technology, Policy Research Group, Ottawa, November 1982.

7 Interim Assessment: Refining One's Definitions

The "Deindustrialization" Syndrome Reappraised

While the various yardsticks of competitiveness set forth in the last three chapters are in no sense conclusive, they make it hard to sustain the view that Canada is "deindustrializing" if that means that manufacturing is losing its edge, relative to other sectors, in international markets and against foreign goods at home. Further, across the board the country would appear to be holding its own in respect of the ratio of domestic shipments of manufactures relative to the Canadian market, despite the growing penetration of this market by imported goods. The reason is that Canada's manufactured products are also increasingly penetrating foreign markets, making up through sales abroad any loss suffered at home, so that the net position over the past fifteen years or so has remained remarkably stable.

These findings are different from the view on such matters commonly offered, which tends to cite the expanding foreign stake in Canadian markets without any reference to the export side. One has to be skeptical about the proposition that a manufacturing sector becoming steadily more capable of mutual interdependence with other countries' industrial systems – that is, able to match the rise in imports from them with its own exports to them – can be said to be deindustrializing in a general way. Interpenetration with foreign economies, meaning as it surely does a gradual escape by Canada from the limitations of the import-substitution policy, is particularly gratifying because of the implication that the limitations of scale and specialization have become less of a problem than they used to be. There is no doubt that adjustments have been taking place by which firms have come to draw down some lines of endeavour most challenged by imports while developing others capable of gaining markets abroad.

This is a way of saying that the production of a whole range of items at less than optimum scale or with inadequate specialization has, by all accounts, been increasingly superseded by emphasis on a narrower range manufactured at more efficient scale and specialization. Such an impression is strengthened by the evidence, noted above, that the categories of products in which Canada experienced a net loss in position exceeded in number those in which it recorded

a net gain, and yet the aggregate standing of manufacturing as a whole did not alter. In a smallish economy that sort of movement from "lots of little things" to a more concentrated spectrum, accompanied by greater integration into the world market, certainly bears all the marks of a maturing industrialization process.

Therefore, if deindustrialization refers to a decrease in the importance of manufacturing relative to services, especially as a source of employment, then it has been happening in Canada but is not in itself an adverse occurrence. If it refers to a decline in the capacity of manufacturing to compete at home and abroad, relative to other sectors, then it has not been happening in Canada, so far as one can see from an analysis of prices, costs, and trade performance data over the past fifteen to twenty-years. The only sense in which deindustrialization might possibly be argued, on some interpretations of the data, to be going on is in the spheres of high technology, but even that is a rather dubious proposition. In any event, the question of whether or not deficits in the trade in high-technology products are a proper source of concern requires consideration of a number of issues, of which the most immediately obvious has to do with Canada's comparative advantage.

Some Possible Reservations

We will consider that subject in the next chapter. Before doing so, however, we should pause to respond rather specifically to a comment that experience suggests will be a common reaction to the previous two chapters' findings. It is the following: With the range of successful Canadian manufacturing industries narrowing, and the more competitive ones seeming in general to be resource-oriented, is not the situation in effect reverting toward that which preceded the National Policy and whose undesirable consequences it was the National Policy's express intention to counteract?

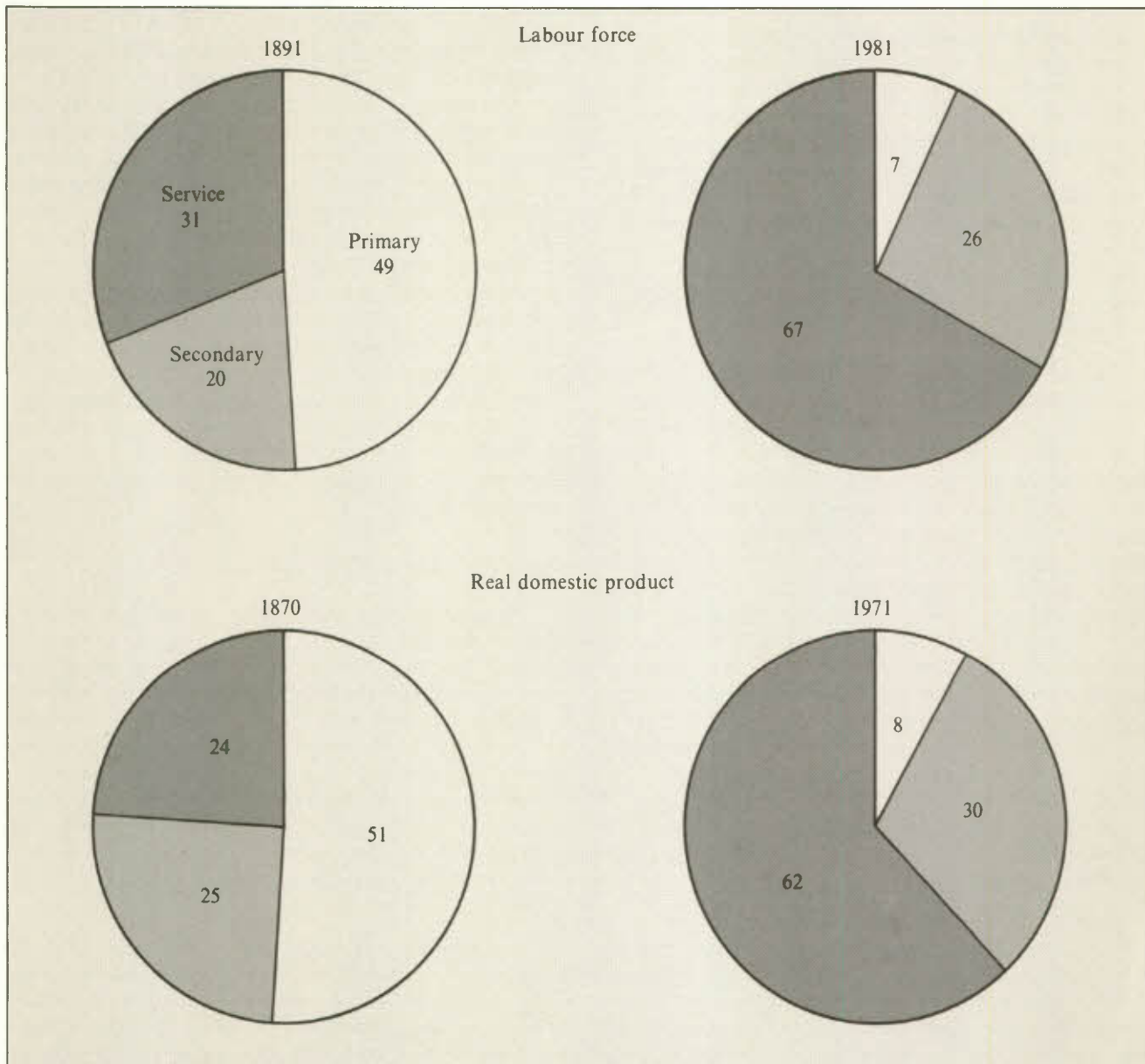
We have already dealt with a large part of such concerns in Chapter 2, in which it was pointed out that the resource industries – and of course those manufacturing sectors associated with them – are now almost entirely "modernized," that the breadth of activities in Canada today seemingly largely obviates any problem of undue vulnerability to externally established price and market factors, and that the growth in services

provides much of the labour-intensive activity – and therefore aggregate employment – that was a particular objective of manufacturing expansion in earlier times. Thus the Canadian economy today bears virtually no resemblance to the situation that existed a century ago, as witness Chart 7-1.

Even so, the adequacy of employment, in particular, may be felt to be at stake in a restructuring trend along the lines observed. Such might well be the reaction to Table 6-1, which indicates as “gainers” industries that are by and large significantly less labour-intensive than many of the “losers.” On this

Chart 7-1

Percentage Distribution of Canada’s Labour Force, 1891 and 1981, and Real Domestic Product, 1870 and 1971, by Major Sector



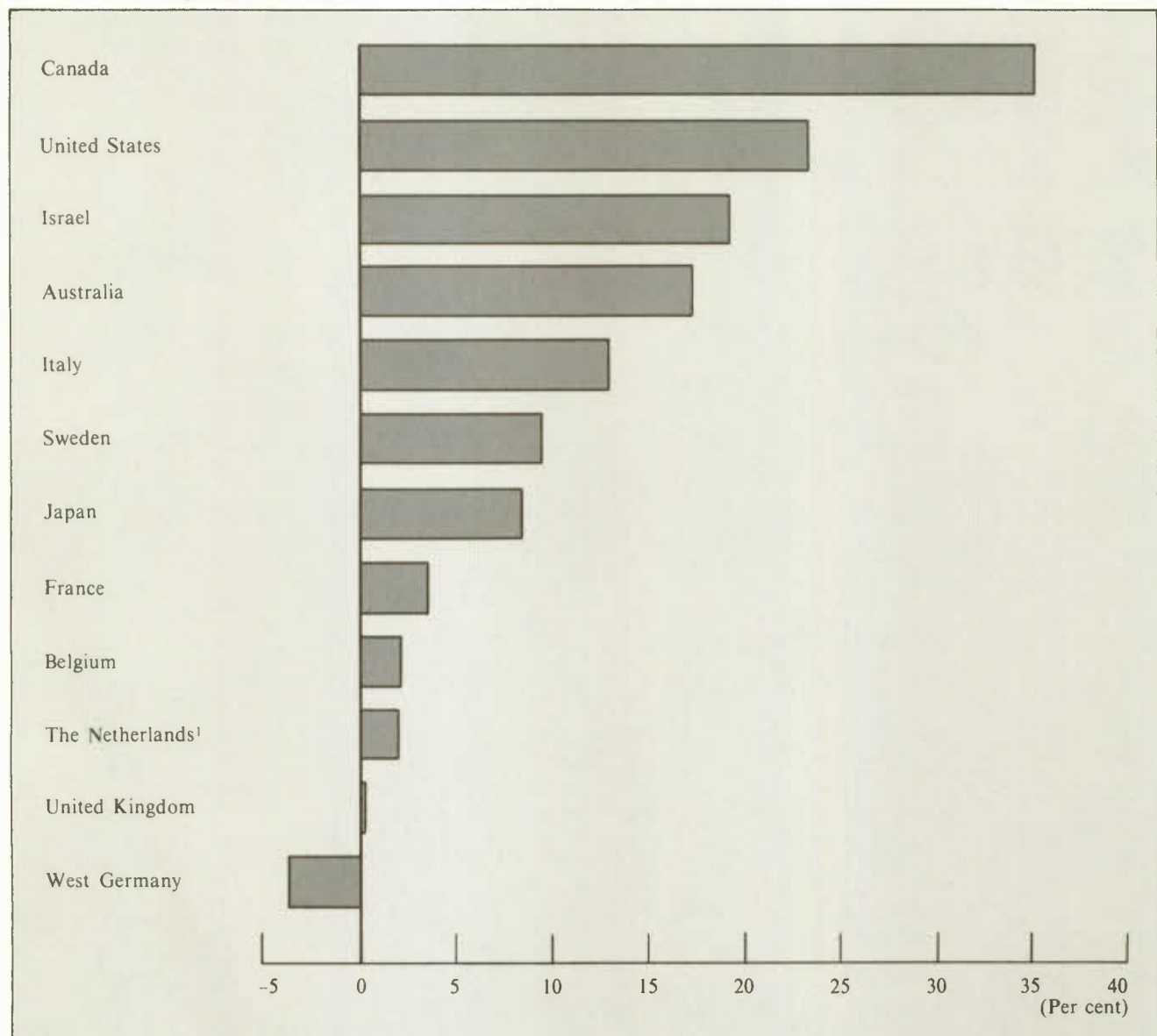
SOURCE M.C. Urquhart and K.A.H. Buckley, ed., *Historical Statistics of Canada* (Toronto: Macmillan, 1965), pp. 59 and 141; Statistics Canada, *The Labour Force*, cat. no. 71-001, December 1979; Statistics Canada, *Indexes of Real Domestic Product by Industry*, various issues; Statistics Canada, *National Income and Expenditure Accounts*, various issues.

score, we should draw the reader's attention again to Chart 4-1, which shows that the fall in Canadian manufacturing employment has been essentially in line with that in the manufacturing sectors of other advanced countries. And we should note that, while Canada's current unemployment rates are certainly a

cause for disquiet, they are not especially high in an international comparison – given the long-standing Canadian record on this score – despite the fact that the pace of expansion of the labour force over the decade of the 1970s was the most rapid in the industrialized world (see Chart 7-2).

Chart 7-2

Growth in Employed Labour Force, Selected Countries, 1970-80



¹ Data are for 1969 and 1979.

SOURCE International Labour Office, *Year Book of Labour Statistics* (Geneva: International Labour Office, various issues).

8 Areas of Comparative Advantage

Are We Focusing on the Right Things?

The next question to be asked is whether the adjustments occurring in the structure of Canadian manufacturing are in truth encouraging our areas of comparative advantage. In this chapter we will examine Canada's comparative advantage, testing the evidence to see whether or not the country really is focusing on its areas of apparent greatest relative endowment or efficiency in trade, because the many distortions to commerce among nations – many of which of course still exist – sometimes result in emphasis on industries of comparative *disadvantage*. Much of the following analysis utilizes methodology, again, first employed in the studies on such matters at DRIE (see the opening to Chapter 5).

The concept of comparative advantage has been subjected to a good deal of study and deliberation among economists for many years, and Canadians have contributed to this work. There is little need to repeat here the basic principle of the idea (referred to in Chapter 1), which is that countries tend to export the output of those spheres of production in which they are best endowed or most efficient relative to the other activities they might engage in. Their opportunity costs being lower in some fields than in others, they are able to offer the products of the former on world markets at prices attractive to countries with a different opportunity-cost mix. It follows that countries will maximize their welfare by concentrating on these products and importing their remaining needs.

This being said, it will be well to note at the outset that comparative advantage is far from being established as one of the unassailable tenets of economic debate. Few people have any argument with the notion itself, but it is becoming increasingly clear that the comparative advantage of a particular country has no fixed and static existence; there is a dynamic quality to the phenomenon. One example of this was contained in the earlier allusions to scale and specialization. If a small economy is relatively inefficient in the production of certain goods because of inadequate scale and specialization, the principle of comparative advantage indicates that it will tend not to export those goods. And yet, should it somehow contrive to export them, perhaps because of some special trade deal or a direct or indirect subvention of some kind, it may thereby increase its total market and thus manage to expand the scale and specialization of its relevant plant to the

point where it becomes relatively efficient. That has happened to the Canadian motor vehicles industry as a result of the Canada-U.S. automotive agreement.

To enlarge on this problem, circumstances may be such that the hitherto relatively inefficient endeavours are ones employing a substantial proportion of highly skilled labour, and in that case the theory implies no comparative advantage for the country in industries featuring such types of labour. How, then, ought an analyst to view the "skilled labour" factor if a trade deal or subsidization of exports, maintained for long enough to overcome the scale-and-specialization problem, would be capable of making such output efficient and internationally competitive?

In light of this dynamic quality, an assessment of Canada's comparative advantage should place its stress less on the general position of products and industries – for on the whole there are few surprises there – than on the *changes* that may be occurring in the importance of various comparative-advantage factors. Especially is that approach to be recommended when exploring the situation of the past fifteen or twenty years, given that the lowering of trade barriers has reduced at least some of the most serious distortions in the international trading system and therefore made it easier for comparative advantage to emerge, in smaller economies as well as larger, as the main determinant of what is actually produced.

We will examine these questions by reference to the two main concepts that have been evident in assessments of comparative advantage. The first, having its origins in the teachings of David Ricardo, to which were added the insights of Alfred Marshall, was enunciated most explicitly in modern times by Heckscher and Ohlin and further elaborated by Paul Samuelson: it is the notion of relative factor abundance. The second, which derives principally from the thinking of Bela Belassa, is based simply on the proposition that the pattern of a country's trade, assessed appropriately against the yardstick of other nations' bundles of exports, will show what it does best: this is the concept of revealed comparative advantage.

Relative Factor Abundance

A number of efforts have been made to elucidate Canada's comparative advantage on the basis of the relative factor endowment technique, including some

important studies by Postner for the Economic Council in the 1970s.¹ More recent work relevant to this question has come from a U.S. study – the multi-country analysis undertaken by Bowen for the Department of Labor in Washington² as background to the far-reaching *Report of the President on U.S. Competitiveness*,³ published in 1980, whose results can be placed alongside Postner's in an attempt to understand better where Canada's strengths reside.

In the Bowen study, the factor endowments of thirty-four countries were computed as of 1963 and 1975 (but expressed in constant 1966 U.S. dollars) and

the relative levels and rates of growth in these endowments were presented, as shown in Tables 8-1 and 8-2 for physical capital and skilled labour. The countries' endowments were measured too as proportions of global resources in each category, as shown in Table A-5 for capital, arable land, and three types of labour – skilled, semiskilled, and unskilled. In a more complex technical exercise the factor services embodied in manufacturing exports and imports were calculated by reference to the importance of these inputs relative to each country's trade, as shown in Table A-6 for capital and skilled labour. This arithmetic makes possible various interesting inferences, not only for U.S. policy purposes but also for Canadian.

Table 8-1

Capital per Worker Endowments and Their Change, 1963 and 1975

	Capital per worker ¹				
	Growth rate	1963		1975	
		(Per cent)	Value (Dollars)	Rank	Value (Dollars)	Rank
Korea	11.9	241	33	1,003	31
Japan	10.1	2,459	19	8,242	14
Greece	9.6	1,263	23	3,980	21
Spain	8.3	2,079	20	5,610	18
Panama	7.1	1,315	22	3,084	22
Turkey	6.7	480	31	1,071	29
Portugal	6.5	889	28	1,947	26
Austria	6.4	3,754	15	8,140	15
Hong Kong	6.0	1,021	27	2,099	25
Brazil	5.9	1,075	26	2,190	23
Mexico	5.9	1,469	21	2,969	23
France	5.8	5,640	8	11,353	5
El Salvador	5.6	545	29	1,066	30
Denmark	5.4	4,694	13	9,030	11
Ireland	5.4	2,469	18	4,747	19
Finland	5.3	5,387	10	10,219	7
Israel	5.1	4,952	11	9,167	10
Philippines	5.1	439	32	812	32
Belgium and Luxembourg	4.7	4,931	12	8,679	13
Norway	4.7	7,580	4	13,314	1
Italy	4.4	3,868	14	6,560	16
India	4.3	162	34	273	34
United Kingdom	4.2	3,673	16	6,010	17
West Germany	4.2	5,665	7	9,422	9
The Netherlands	4.1	5,473	9	8,984	12
Argentina	4.0	2,544	17	4,124	20
Sweden	3.9	7,710	3	12,438	3
Switzerland	3.8	7,251	5	11,422	4
Australia	3.4	6,490	6	9,733	8
Canada	2.7	9,019	2	12,463	2
Colombia	1.8	1,115	25	1,381	27
United States	1.7	9,204	1	11,270	6
Yugoslavia	-0.5	1,239	24	1,165	28
Ghana	-1.4	501	30	421	33

1 In constant 1966 U.S. dollars.

SOURCE Harry P. Bowen, *Changes in the International Pattern of Factor Abundance and the Composition of Trade* (Washington: U.S. Department of Labor, Bureau of International Labor Affairs, 1980).

Table 8-2

Skilled Labour Endowments and Their Change, 1963 and 1975

	Skilled labour relative to all labour					
	Growth rate	1963			1975	
		(Per cent)	Per cent	Rank	Per cent	Rank
Turkey	5.24	2.10	32	3.94	31	
Philippines	5.21	3.06	28	5.72	25	
Greece	4.17	3.96	25	6.53	22	
Ghana	4.12	2.69	30	4.41	29	
India	4.04	1.91	34	3.10	33	
Denmark	3.80	9.06	11	14.30	8	
Finland	3.79	9.31	10	14.68	5	
Brazil	3.71	3.64	27	5.68	26	
Norway	3.57	9.75	9	14.96	3	
Korea	3.50	2.01	33	3.06	34	
Mexico	3.48	4.30	24	6.53	23	
Italy	3.46	5.30	20	8.03	19	
Yugoslavia	3.38	6.13	18	9.20	17	
Japan	3.37	5.20	21	7.79	21	
Israel	3.32	12.13	3	18.07	2	
United Kingdom	3.26	8.65	13	12.79	11	
Colombia	3.25	3.77	26	5.57	27	
France	3.13	9.91	7	14.43	6	
The Netherlands	3.02	10.28	6	14.77	4	
West Germany	3.01	8.41	14	12.07	12	
Panama	2.90	5.67	19	8.03	20	
Switzerland	2.81	9.83	8	13.77	9	
Spain	2.61	4.60	23	6.29	24	
Portugal	2.57	2.96	29	4.03	30	
Ireland	2.49	7.45	15	10.05	15	
Sweden	2.26	14.60	1	19.15	1	
Australia	2.07	8.78	12	11.26	14	
Austria	2.06	7.19	16	9.21	16	
Argentina	2.00	6.49	17	8.25	18	
El Salvador	1.66	2.63	31	3.21	32	
Canada	1.55	11.40	4	13.73	10	
United States	1.27	12.32	2	14.35	7	
Belgium and Luxembourg	.59	11.12	5	11.93	13	
Hong Kong	.58	4.82	22	5.17	28	

SOURCE Harry P. Bowen, *Changes in the International Pattern of Factor Abundance and the Composition of Trade* (Washington: U.S. Department of Labor, Bureau of International Labor Affairs, 1980).

The most basic piece of information to be derived from the tables is the overall importance of various resource factors, which is best revealed in Table A-5. Not surprisingly, it is apparent that Canada enjoys an unusually rich endowment of arable land; after that, its relative endowments, in declining order of abundance, are capital, skilled labour, semiskilled labour, and unskilled labour. Between 1963 and 1975 this order did not change, but all the quantities fell somewhat except skilled labour (which rose by a small fraction) and semiskilled labour (which increased quite substantially).

Looking more closely at the changes in these endowment factors, one may observe from Table 8-1 that Canada ranked second of all the thirty-four nations in abundance of capital per worker in both 1963 and 1975, but that its growth rate in this respect was one of the lowest in the list. In terms of world shares of capital applied to industry (see Table A-5), the Canadian position declined slightly. These standings imply that Canada's comparative advantage is great in capital-intensive activities, although there may have been some erosion in that characteristic during the 1960s and 1970s. Table A-6 bears out the impression,

revealing Canadian manufactured-goods exports as embodying more capital than those of any other developed country except Australia, but also demonstrating that this peculiarity was weakening over the period (whereas in the Australian case it was strengthening).

More striking is the position with regard to endowments of skilled labour, as shown in these tables. Table 8-2 shows that Canada fell from fourth to tenth among the thirty-four, so far as the ratio of skilled workers to total labour is concerned, between 1963 and 1975, even though Table A-5 records a very slight rise in Canada's share of the world's resources of skilled labour. From Table A-6 it is clear that Canadian manufactured-goods exports displayed a level of skilled-labour intensity normally exceeded only by the United States and the United Kingdom (with The Netherlands roughly similar to Canada) over the period. No systematic decline is evident in the Canadian figures here. While it is hard to pick any obvious inference from such seemingly conflicting evidence, one would tend to interpret the data as meaning that Canada's comparative advantage in products incorporating a large amount of skilled labour was less pronounced in the mid-1970s than it had been in the early 1960s. There are, however, some other possible explanatory factors which we shall touch on in a moment.

As to the import side, Table A-6 shows that the capital intensity of Canadian imports is much lower than that of exports; among the thirty-four countries only Australia, Austria, Hong Kong, Norway, and Sweden consistently manifested a capital intensity of imports anywhere near as low as Canada's. In respect of skilled-labour intensity, Canada's imports are much the same as its exports; these imports are, however, rather more skilled-labour intensive than most industrial countries' (the two clear exceptions being Italy and Japan) and very close to a par with Australia's.

As might be expected, the findings from this U.S. work accord pretty well with those from Postner's, despite differences in approach and the fact that the U.S. study was confined to manufacturing whereas Postner's covered all industries.⁴ The descending scale of Canadian comparative advantage, as outlined by Postner, ran in seven categories from nonrenewable and renewable natural resources, through capital in the form of structures and machinery, to elementary, high school, and university labour. Both the U.S. study and Postner's found some decline over time in the capital intensity of Canadian exports and some increase in the skilled-labour intensity of Canadian imports. It is useful to compare these indications now with the evidence on revealed comparative advantage, as deduced from an analysis of actual trade data.

Revealed Comparative Advantage

Recent work on revealed comparative advantage in Canada has been undertaken by the Department of Regional Industrial Expansion, using its international trade data bank. That analysis, available for the full range of twenty manufacturing industries, shows in effect the strength of each in the Canadian export structure, comparing their share of all Canada's exports of manufactures with the relative importance of all OECD countries' manufactured goods exports similarly disaggregated (see Table 8-3). As can be seen, for the years 1973-79 it provides a quite dramatic picture of great and growing comparative advantage in the wood products industry and to a lesser extent the paper industry; more modest but clear comparative advantage, though declining slowly over the period, is indicated for the primary metals and transportation industries. All the other sixteen industries are shown as having a comparative disadvantage in Canada, although the food and beverage industry comes fairly close at times to comparative advantage and the petroleum and coal industry (which demonstrates very large if erratic gains in this regard through the years covered) also approaches comparative advantage in the latest year recorded.

That assessment may be augmented by reference to a further Canadian offshoot of the U.S. Department of Labor multi-country work, this one prepared for the period 1962-77 by the Department's personnel from unpublished material held in their data file.⁵ The printouts for Canada give revealed comparative advantage statistics for ninety-four SITC product categories, in the form both of an index (see Table A-7) and of a ranking of position in that index (see Table A-8). Revealed comparative advantage is present when the index exceeds unity. The relevant information from the data is summarized in Table 8-4, which lists the products that gained, maintained, and lost comparative advantage according to the index (plus two that gained it and then lost it) as well as noting the rank each of these products held at the start and at the end of the period concerned.

It is very obvious that the product groups in the "gained" and "maintained" categories in Table 8-4 are for the most part items that would be found in a more detailed breakdown of Table 8-3 if one were available. A number are primary metals, several are wood and paper products, and one – road motor vehicles – is the biggest single class of transportation equipment. However, there are in addition some important chemicals, fabricated metal products, machinery, and other goods.

Table 8-3

Index of Canadian Manufacturing Industries' Revealed Comparative Advantage, 1973-81¹

	1973	1974	1975	1976	1977	1978	1979	1980	1981
Manufacturing:	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Food and beverages	0.845	0.749	0.818	0.801	0.820	0.769	0.845	0.801	0.848
Tobacco products	0.037	0.087	0.038	0.038	0.036	0.030	0.032	0.032	0.030
Rubber and plastics	0.318	0.302	0.344	0.547	0.416	0.425	0.482	0.433	0.562
Leather products	0.183	0.250	0.269	0.267	0.266	0.240	0.174	0.178	0.189
Textiles	0.125	0.144	0.127	0.112	0.102	0.101	0.099	0.119	0.124
Knitting mills	0.053	0.062	0.029	0.045	0.030	0.029	0.333	0.320	0.343
Clothing	0.598	0.532	0.430	0.353	0.318	0.284	0.373	0.404	0.458
Wood products	5.929	5.000	5.112	5.683	6.588	7.493	7.521	6.067	5.915
Furniture	0.441	0.476	0.397	0.360	0.358	0.337	0.466	0.517	0.605
Paper	4.443	4.859	5.452	5.329	5.271	4.682	5.176	6.272	5.116
Printing	0.464	0.574	0.561	0.606	0.522	0.481	0.529	0.638	0.623
Primary metals	1.152	1.069	1.114	1.171	1.085	1.095	1.053	1.274	1.327
Metal fabricating	0.420	0.517	0.436	0.377	0.383	0.345	0.508	0.496	0.522
Machinery	0.458	0.516	0.524	0.477	0.486	0.606	0.591	0.569	0.639
Transportation	1.940	1.913	1.854	1.866	1.902	2.007	1.766	1.511	1.572
Electrical	0.286	0.322	0.293	0.239	0.224	0.214	0.311	0.339	0.391
Nonmetallic mineral	0.402	0.393	0.352	0.325	0.367	0.413	0.497	0.381	0.418
Petroleum and coal	0.592	0.728	0.571	0.292	0.315	0.461	0.847	0.811	0.836
Chemicals	0.422	0.424	0.501	0.528	0.570	0.572	0.540	0.591	0.676
Miscellaneous manufacturing	0.255	0.268	0.291	0.249	0.209	0.224	0.224	0.249	0.264

¹ Calculated as a series of fractions in which the dividend in each case is the respective sector's exports as a percentage of total Canadian manufactured goods exports while the divisor is all OECD countries' exports in that category as a percentage of all OECD manufactured goods exports.

SOURCE: International Trade Data Bank, Department of Regional Industrial Expansion.

The Inferences to be Drawn

Viewed together, the indications on factor abundance and on revealed comparative advantage are, in broad terms, clearly consistent. Canada's generous endowment of land accords with the emphasis on certain renewable resources in exports, and the methods employed to exploit both those and other renewable and nonrenewable resources nowadays provide for an effective application of the capital in which the country is also shown to be relatively abundant. Most of the particular industry groups shown as having comparative advantage in Canada are indeed associated with resource development and characterized by extremely capital-intensive techniques of production. The capital-intensity/resource-exploitation nexus thus seems to be a feature of Canadian comparative advantage, and it is interesting to see Australia appearing in the tables as the nation most similar to Canada in that respect. Likewise interesting is the fact that the countries coming close to Canada in the low level of capital intensity of their imports (which of course tend to be the things they do not produce for themselves) are also for the most part important primary producers: Australia, Austria, Norway, and Sweden.

Nonetheless, the comparative advantage in capital-intensive activities has seemed to be declining slightly, as we have noted, which could suggest that industries other than the primary resource group are beginning to demonstrate greater effectiveness. These might well be the transportation equipment manufacturers, chemical processors, producers of fabricated metal goods, builders of machinery, and others that Table 8-4 adds to the more traditional list.

At the same time, the rise in importance of these latter industries in the standings may seem inconsistent with the evidence, mentioned above, that there has been some falling away in the Canadian comparative advantage attaching to products incorporating a large amount of skilled labour. However, the explanation there may lie in the extraordinarily rapid growth in the labour force in Canada in recent times, which would tend to have two effects: (a) to make labour decline in price relative to capital and (b) to cause unskilled and semiskilled labour (meaning younger workers and women, whose numbers have been rising the fastest) to become relatively more cost-attractive to employers than skilled workers (that is, experienced older people whose wage levels are established and who are better

organized to maintain them). This reasoning seems plausible in light of the fact that the United States, which had the advanced world's second most rapidly growing work force after Canada in the 1960s and 1970s (see Chart 7-2), is the only other country in Table 8-2 (except for Belgium and Luxemburg) to show a sharp decline in position with respect to skilled labour as a proportion of total labour.⁶

What may be inferred, then, is that Canadian comparative advantage has shifted somewhat towards a set of industries outside the resource-oriented group, thus slightly de-emphasizing the capital-intensity factor, but that it has not focused on the skilled-labour-intensity element as much as might be expected because of the temporary enlargement in the supply of less skilled workers.

Table 8-4

Canadian Manufacturing Industries that Gained, Maintained, or Lost Revealed Comparative Advantage in the Period 1962-77 and RCA Ranking in Each of Those Two Years

	Ranking	
	1962	1977
Gained comparative advantage		
661 Lime, cement and fabricated building materials	31	21
694 Nails, screws, nuts, bolts, rivets and similar	41	19
732 Road motor vehicles	63	12
Maintained comparative advantage		
513 Inorganic chemicals, elements, oxides	15	17
561 Fertilizers, manufactured	14	4
631 Veneers, plywood boards	7	13
632 Wood manufactures, n.e.s.	10	7
641 Paper and paperboard	2	2
671 Pig iron, spiegeleisen, sponge iron	11	16
676 Rails and railway track construction material	13	15
679 Iron and steel castings and forgings, n.e.s.	6	5
681 Silver, platinum and other metals	8	8
682 Copper	9	11
683 Nickel	1	1
684 Aluminium	4	10
685 Lead	5	9
686 Zinc	3	3
689 Miscellaneous nonferrous base metals	12	20
711 Power-generating machinery, nonelectric	21	14
712 Agricultural machinery and implements	16	18
842 Fur clothing (not including headgear)	20	6
Lost comparative advantage		
514 Other inorganic chemicals	18	22
672 Ingots and other primary forms of iron and steel	19	60
734 Aircraft	17	24

Note Two industries gained RCA over the period but then lost it again: 713 — Railway vehicles; 861 — Scientific instruments.

SOURCE Tables A-7 and A-8.

9 Conclusion

Evaluating the Evidence

Let us then consider the earlier findings as regards relative competitiveness, juxtaposed with the above observations in respect to comparative advantage. The analysis in Chapters 4 and 5 showed that Canada's manufacturing industries had held their own in overall terms, the increase in penetration of the Canadian market by foreign goods having been offset almost exactly by Canadian export successes in foreign markets. Nevertheless, in Chapter 6 it was made clear that this equilibrium in the aggregate concealed gains and losses among individual industry sectors. How do the "gain" situations in trade performance over the past twenty years fit with the fields of comparative advantage as observed from the assessment in the last chapter?

It would seem that they fit very well indeed. Among the most competitive sectors were wood products, paper and allied items, iron and steel, nonmetallic mineral products, and petroleum and coal products, along with some individual categories of fish products, a small selection of textile and clothing goods (notably fur garments), some sorts of furniture, some transportation equipment, a few chemical classifications including fertilizers, and the odd miscellaneous manufacture. The coincidence between that list and the spheres of comparative advantage indicated in the preceding evaluation is extremely close.

From this coincidence it would be easy to conclude that Canada is producing pretty much the right things. Notwithstanding the distortions in the international system, Canadian export achievements are most marked, by and large, in the sorts of industrial sectors that a separate analysis suggests as having the best potential for effective performance. On the face of it, in other words, the manufacturing complex in Canada is achieving a satisfactory position in home and foreign markets by concentrating on the range of goods that the principles of comparative advantage tell us will be most likely to maximize the nation's economic well-being. One's predominant reaction to that set of indications is bound to be that the case for an interventionist industrial policy seems to be lacking: if Canada is losing ground in high-technology products it is because they are not spheres of comparative advantage in this country.

What Has Not Been Shown

So far so good. But it is important to recognize that the entire body of available evidence is strictly from the past. There are a number of comments that ought to be made about assuming too readily the absence of any adjustment difficulties in the future or inferring that there is no case whatever, in light of such considerations, for a more interventionist industrial policy.

First of all, one cannot help but be uneasy about the fact that the results of our analysis rest on the mutually offsetting effects of sluggish productivity gains and slowly growing labour compensation. In a very real sense, the implication is that manufacturing in this country has remained internationally competitive at the expense of a deterioration in Canadian living standards relative to those abroad – although this conclusion is somewhat softened by the points noted in the last chapter about growth in the lower-skilled elements of the work force.

And that is not all. While the causes of disappointing productivity performance are difficult to identify – a problem the Economic Council is grappling with in its present work – it is evident that inadequate rates of capital investment in new plant and equipment can certainly be relevant to the issue. In fact, levels of gross fixed capital formation in Canada have not changed significantly over recent years as a proportion of national output, remaining among the highest in the world (see Table 9-1). However, it is arguable that this ratio ought to have gone up simply because of the depressed national production figures – that is, that the failure of the percentage to increase when the divisor is low means a weakening trend and possibly the beginning of a downward spiral of slow investment/slow growth. There are many other possible interpretations of what has been going on, but a pessimist could suggest that this is the potential result of the trend of events.

Might such a process result from a squeeze on corporate earnings due to competitive pressures in the market place? Profits fell substantially in the late 1970s and early 1980s. In other words, could the weakness in respect of productivity improvement be ascribed in important measure to a shaving of profit margins forced on firms in their efforts to keep prices in line with those of foreign producers?

Table 9-1

Ratios of Capital Investment to National Output¹ Compared with Rates of Economic Growth,² Canada and Six Other Leading Industrial Countries, 1976-82

	Investment/GNP ratio			Growth in national product		
	1976-80	1981	1982	1976-80	1981	1982
	(Per cent)					
Canada	23.2	24.4	21.9	2.9	3.1	-4.8
France	22.0	21.0	n.a.	3.3	0.3	n.a.
West Germany	21.1	22.0	20.5	3.5	-0.2	-1.1
Italy	19.4	20.3	19.2	3.9	0.1	0.4
Japan	31.3	31.1	29.7	5.2	3.8	3.0
United Kingdom	17.9	15.8	n.a.	1.7	-2.0	n.a.
United States	18.4	17.6	16.5	3.7	1.9	-1.7

1 Gross fixed capital formation expressed as a percentage of gross national product (except in France, where the divisor is gross domestic product).

2 Growth rate in gross national product (except in France's case, where it is gross domestic product).

SOURCE: International Monetary Fund, *International Financial Statistics* (Washington: International Monetary Fund, August 1983).

If that were so, then the outlook for relative competitiveness over the longer term might well be much less promising than the foregoing assessment would suggest. Clearly, if capital investment in productivity-enhancing facilities and technology were to slump and remain low over a prolonged period, not even the inhibitions on growth in wages and salaries would suffice to prevent a loss of competitive edge; quality would begin to suffer and the overall curtailment of productive stimulus in the business sector would have its consequences in reduced market effectiveness. Should such a point be reached, one could expect the more or less orderly and smooth structural adjustment described in our evaluation to give way to a disruptive contraction of the whole manufacturing complex, with considerable unemployment.

It would be decidedly premature to conclude that anything along these lines is occurring at present. Indeed, the behaviour of capital investment is much like that in other countries, as Table 9-1 reveals, and the causes of the productivity puzzle have yet to be clarified. But the ongoing process of industrial adaptation and redeployment needs to be continuously monitored, with particular attention to profits, capital investment, and productivity performance, to ensure that a vicious circle of the kind indicated does not start to develop.

The other major caveat to be made about the findings of this paper concern implications for a directed industrial policy, as they might be interpreted in light of the points about Canada's comparative advantage. As we have noted already, the comparative advantage of a country is not static but dynamic: it can change with the changing circumstances of industrial

development. There can also, in principle, be socio-political and even cultural reasons, despite the general impression of doing quite well on the basis of output-to-market balance (implied self-sufficiency), for wishing to encourage a certain structure of industry and a certain stress in trading patterns. Trade competitiveness may not perhaps always be the final arbiter of what is desirable for an economy – and still less for a society.

A very particular drawback to any simplistic argument on this score should underline the belief that more imaginative and probing questions must be asked about the goals of industrial policy – namely, that there is a danger of circularity in the evolution of both comparative advantage and competitiveness. Nations, like people, tend to succeed in the enterprises on which they concentrate, and the fact that Canada has succeeded up to now through concentrating on the exploitation of natural resources might not necessarily mean that other, less obvious areas of concentration were precluded from yielding similar benefits. We have already made this point in referring to scale and specialization, but the most significant application of such considerations lies elsewhere.

The essence of the matter is that intellectual and entrepreneurial capability – or, perhaps more accurately, the innovations to which such capability tends to give rise – can hardly be viewed as irrelevant to the question of factor inputs. Agglomerations of bright and energetic people provide the vital catalyst to all economic development, and in the modern age they do so usually by assuring the invention of new ways of combining natural resources, capital, and labour to

produce a familiar good or service more efficiently or, very often, to produce a good or service that has not existed before. This is a feature of the economic process entirely different from the mere utilization of skilled or professional workers in the labour force.

Recognition of the importance of these elements has inclined economists to add "intellectual capital" to the list of basic production factors or to suggest that "technology" should in some fashion be taken into account in calculating comparative advantage. It has, moreover, led some observers of the Canadian context to the view that weakness in technological capability is locking Canada into pursuits closely identified with traditional industries. These critics argue that the importance of resource-oriented output has occurred simply because the resources are there, whereas more imaginative policies might allow us to achieve higher levels of national income by adding other opportunities for comparative advantage to the cause-and-effect circle of primary-goods exploitation and export. This could be achieved, they suggest, notably through the cultivation of intellectual and technical resources that (in their opinion) we have left underemployed.

Therefore, while the evidence at face value is that Canada has adjusted extremely well to the phasing out of the old industrial policy of high tariffs, since its manufacturing sector is apparently restructuring to accentuate internationally competitive industries in the fields where its comparative advantage is greatest, the position may not be that simple.

New Guidelines for the Future?

The trouble is that no very convincing theory has yet been developed to underpin these rather vague propositions. Although all sorts of possibilities may be felt to exist for improving on the conventional means of identifying industrial opportunity, nothing in the way of a set of analytical tools is available to provide a pointer. It would be easy, of course, to assume that any technology-intensive pursuit must yield great benefits and that therefore we should encourage all such activities with public support of various kinds. But there are an immense number of technically innovative concepts surfacing continuously, no more than a fraction of which are likely to be particularly appropriate to Canada's circumstances – or in many instances, indeed, to be a success in any environment. Offering blanket encouragement to every inventive notion that came along would therefore have the effect of channeling a lot of money from the public purse into the hands of a group of scientists and businessmen who would only rather occasionally use it for beneficial ends. When they used it for failures the result would be economic loss for the taxpayer to little advantage for almost anyone else.

For this reason the idea has developed that industrial policy must mean a choice from among the spectrum of technologically interesting prospects. The choice must be based on a concept of national interests and peculiarities that make certain kinds of endeavours more relevant than others to Canadian goals or (and this is really saying the same thing in another way) more susceptible than others to yielding effective results for the Canadian economy and society. However, the grounds upon which such a choice should be made are far from clear. It has been argued that Canada has a well educated work force and therefore would be advised to stress activities calling for a large contribution from highly trained personnel. Yet the preceding factor-content analysis, for all its faults, gave some justification for questioning that idea. One should not exaggerate the virtues of the Canadian labour force, which although improving sharply in quality in recent years (as has been noted) is probably still a little less well educated and trained than the work forces of our principal trading partners – countries like the United States, Japan, the United Kingdom, West Germany, and France.¹ Moreover, even if the gap has been eliminated there is no special merit accruing to Canada, from the evidence we have adduced, that would cause it to thrive by engaging in much the same enterprises as these other economies. In any case, the specification of "educated-labour-oriented" pursuits is just too broad to be useful.

Thus, any sensible choice would seem to have to rest on some perceptions about the way the world is heading and about the way Canada, with its particular characteristics, can most effectively organize itself to benefit from the global trend. It would seem, too, to have to take account of the evident preferences of today's and tomorrow's Canadians as workers, consumers, taxpayers, and citizens. This means that an attempt must be made to look into the future, as far as one can do so without allowing projection to degenerate into speculation. And it means that the objectives of Canada as a nation, to the extent that they may be discerned in the present climate of uncertainty, must somehow be related to that future.

Recap: The Findings of This Analysis

Such an exercise in policy assessment clearly goes well beyond the scope of this paper. We have sought only to raise the level of the discussion a fraction by removing some of the most obvious misunderstandings about Canada's current position in manufacturing trade and competition. Let us, in closing, recapitulate briefly what the analysis has revealed and what it has left unresolved, in light of the questions posed in Chapter 2.

We asked whether the lowering of import protection had encouraged an adjustment into fields of comparative advantage, so that the efficiency of the economy was being enhanced. To that question the answer appears to be yes. We enquired whether, despite these improvements in efficiency for the total economy, large parts of manufacturing were being wiped out. The answer here is that the manufacturing complex as a whole is being gradually restructured, with some elements of certain industries gaining and others losing, but that the overall size of the manufacturing sector seems to have been sustained and its competitive position in international trade to have remained in line relative to other sectors. That does not mean, however, that its productivity performance is satisfactory or that Canadians should be in any way complacent about its record in general; indeed, the weakness in respect of productivity may hold some risks for the future.

This concern about productivity focused, in our interpretation of what the analysis reveals, on the possibility that competitive difficulties (and thus shrunken profits) might ultimately lower levels of capital investment in new plant and equipment, hampering efficiency of output. Such a connection, if sustained for very long, could undermine the health of the manufacturing sector over a longer-term horizon, creating the sort of fundamental problem hinted at in our third question. Nevertheless, this was a conceivable scenario to be watched for, rather than anything visible at present. Finally, there was the matter of Canada's larger goals as a nation and how they related to the evolution of manufacturing over the past couple of decades. On this matter our appraisal was necessarily inadequate; it must be left to some other enquirer using an altogether different method of evaluation to push the investigation further.

We might, however, in closing offer one comment on the wider objectives of national policy, concerning an aspect of the subject under examination that we have perforce not directly dealt with. This is the fact that, although trade liberalization has served to encourage a more competitive structure of industry in general, its uneven sectoral effect has been destructive of one of

Canada's most crucial political purposes: the maintenance of balanced economic growth and income across the country. From Table 6-1 and Table A-4 it is evident that certain of the twenty main industry groups figure very prominently among those losing position in our 1966-80 analysis: they are leather industries, textiles, knitting mills, clothing industries, electrical products industries, and miscellaneous manufacturing industries. There would be nothing especially remarkable about that – it would be similar to other instances of “losers” in the structural adjustment process – were it not that these industries are largely concentrated in a few economic regions where they provide a substantial portion of the available employment.

At present, of course, the region most obviously affected, since its work force is heavily dependent on labour-intensive industries like textiles, clothing, and shoes, is the province of Quebec. Nevertheless, other industries with a strong regional orientation may be in the same position in years to come. The phenomenon of regional decline, actually occurring or merely threatened, gives rise to that type of industrial policy that was referred to earlier as “defensive.” It is every bit as important to the discussion in this field as is the “innovative” type of industrial policy and must be considered concurrently in the effort to explore the shape of future events and Canada's role in them.

Moreover, the regional issue has many other relevant aspects in this connection. Might a more interventionist industrial policy be helpful in changing regional patterns of development for the better? Or is the likelihood that it would be executed principally at the provincial level, causing mutually destructive bidding for desired industries and a further dislocation and fragmentation of the Canadian common market? Examination of these and other larger questions is, as we have noted, a task whose requirements are too far-reaching to be covered here.

In short, our verdict on the case for an industrial policy in Canada is the one that can be found in trials under Scottish law – “not proven.” But the dialogue must continue.

Statistical Tables

Table A-1

Consumer Prices, Compound Annual Rates of Change, Selected Countries, 1960-81

	1960-65	1965-70	1970-75	1975-81	1960-81
	(Per cent)				
National currency basis:					
Belgium	2.5	3.5	8.4	6.6	5.3
Canada	1.6	3.9	7.3	9.4	5.7
France	3.7	4.4	8.9	10.9	7.1
West Germany	2.7	2.7	6.2	4.4	4.0
Italy	4.9	3.0	11.4	16.6	9.2
Japan	6.2	5.5	11.5	6.3	7.3
The Netherlands	3.3	4.8	8.6	6.1	5.7
Sweden	3.7	4.4	8.0	10.8	6.9
Switzerland	3.3	3.4	7.7	3.0	4.3
United Kingdom	3.6	4.5	13.0	13.9	8.9
United States	1.3	4.2	6.8	9.1	5.5
U.S. dollar basis:					
Belgium	2.5	3.5	15.2	2.8	5.7
Canada	-0.6	4.5	7.9	6.4	4.6
France	3.7	2.0	14.6	6.6	6.6
West Germany	3.7	4.5	14.9	5.9	7.1
Italy	4.9	3.0	10.4	6.3	6.1
Japan	6.2	5.5	15.9	11.7	9.8
The Netherlands	4.3	4.8	16.7	6.4	7.9
Sweden	3.7	4.4	12.8	7.2	7.0
Switzerland	3.3	3.4	19.6	7.8	8.3
United Kingdom	3.6	7.9	14.8	1.3	6.5
United States	1.3	4.2	6.8	9.1	5.5

SOURCE International Money Fund, *International Financial Statistics* (Washington: International Monetary Fund, various issues).

Table A-2**Unit Value of Exports (Export Prices), Compound Annual Rates of Change, Selected Countries, Based on U.S. Dollars, 1960-81**

	1960-65	1965-70	1970-75	1975-81	1960-81
	(Per cent)				
All exports:					
Belgium	0.0	2.1	13.7	1.4	4.1
Canada	-0.7	3.4	12.2	-1.5	3.0
France	1.3	1.3	15.0	-1.8	3.5
West Germany	2.1	3.1	14.4	2.7	5.3
Italy	-0.4	1.5	14.3	-5.7	1.8
Japan	-3.3	2.5	12.8	5.6	4.3
The Netherlands	1.5	0.8	16.0	2.8	5.0
Sweden	1.2	2.8	17.2	-1.7	4.3
Switzerland	3.0	2.6	17.1	5.2	6.7
United Kingdom	1.8	7.8	16.5	2.8	6.8
United States	1.0	3.1	12.0	1.5	4.2
Manufactured exports:					
Belgium	0.4	2.4	13.1	4.9	5.1
Canada	-1.0	3.8	7.4	7.2	4.4
France	1.3	1.7	14.4	5.3	5.5
West Germany	1.8	0.9	15.8	4.9	5.6
Italy	-0.8	1.9	12.7	6.0	4.9
Japan	-1.9	2.7	12.3	8.0	5.3
The Netherlands	2.6	0.4	14.4	4.7	5.4
Sweden	1.0	3.7	15.8	5.3	6.3
Switzerland	3.3	2.8	16.8	6.9	7.3
United Kingdom	2.0	1.9	11.9	12.3	7.2
United States	0.8	3.5	9.7	9.5	6.0

SOURCE: United Nations, *Monthly Bulletin of Statistics* (New York: United Nations, various issues). *International Financial Statistics* (Washington: International Monetary Fund, various issues).

Table A-3**Relative Indexes of Output Per Hour, Hourly Compensation, and Unit Labour Costs in Manufacturing, Eleven Countries, 1970-81¹**

Year	United States	Canada	Japan	France	West Germany	Italy	United Kingdom	Belgium	Denmark	The Netherlands	Sweden
	(1970 = 100)										
Output per hour											
1970	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1971	100.7	101.2	101.0	100.4	98.9	98.1	98.7	101.4	101.2	101.7	100.0
1972	98.5	100.0	105.9	98.9	98.0	99.0	99.4	105.6	102.2	102.4	98.2
1973	96.5	100.3	109.5	96.9	96.2	103.8	98.4	109.2	105.2	105.5	98.3
1974	91.0	103.6	110.2	97.2	98.7	105.8	96.5	111.1	105.5	110.6	99.2
1975	92.6	98.4	112.3	98.4	102.9	98.1	92.1	113.4	114.6	105.4	96.5
1976	90.3	98.7	115.9	99.6	102.8	99.6	89.5	116.5	112.0	111.2	91.4
1977	88.8	99.8	120.4	101.0	104.2	96.6	87.5	119.2	110.7	111.0	86.6
1978	85.9	99.6	126.3	103.0	103.2	95.8	87.1	120.0	109.1	113.9	87.2
1979	82.3	99.4	132.9	103.0	103.1	98.3	86.0	121.7	109.8	113.9	90.4
1980	81.0	95.4	140.3	102.3	102.1	102.1	84.8	123.1	109.2	113.1	89.8
1981	81.1	93.0	140.5	100.6	101.6	102.3	87.4	128.5	111.9	112.9	87.0

Table A-3 (concl'd)

Year	United States	Canada	Japan	France	West Germany	Italy	United Kingdom	Belgium	Denmark	The Netherlands	Sweden
(1970 = 100)											
Hourly compensation											
1970	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1971	94.2	99.8	104.8	99.3	99.8	103.0	102.9	101.8	102.2	101.8	100.2
1972	88.7	99.9	110.5	99.2	98.7	106.1	105.1	105.6	101.3	104.6	100.7
1973	82.4	100.7	120.8	98.4	96.3	118.3	102.5	107.4	107.8	109.4	98.8
1974	75.4	103.0	136.3	98.7	91.8	124.4	108.7	110.5	109.3	109.7	97.4
1975	71.4	103.5	136.5	99.7	86.1	137.9	121.7	114.2	109.9	106.7	100.3
1976	68.6	108.4	130.6	102.3	82.0	149.7	128.8	115.6	109.2	108.1	106.8
1977	66.6	110.4	129.4	104.4	80.9	161.0	130.8	115.9	108.7	105.4	105.0
1978	65.8	108.2	124.3	107.0	79.2	168.3	139.5	113.2	108.4	104.1	106.1
1979	65.2	108.3	119.2	110.2	75.9	180.4	151.2	109.9	109.4	101.7	103.1
1980	65.3	105.5	112.5	114.8	72.6	192.1	168.4	107.2	107.8	95.2	101.6
1981	64.5	106.1	108.1	120.5	69.0	213.5	176.6	105.3	105.6	90.2	102.7
Unit labor costs in national currency											
1970	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1971	93.6	98.6	103.7	98.9	101.0	105.0	104.3	100.4	101.0	100.1	100.2
1972	90.0	99.9	104.4	100.3	100.7	107.2	105.8	100.0	99.1	102.1	102.4
1973	85.4	100.4	110.3	101.6	100.1	113.9	104.2	98.4	102.5	103.7	100.5
1974	82.9	99.4	123.6	101.6	93.0	117.7	112.7	99.5	103.6	99.1	98.2
1975	77.1	105.2	121.5	101.3	83.6	140.6	132.1	100.7	95.9	101.3	103.9
1976	76.0	109.9	112.8	102.7	79.7	150.3	143.9	99.2	97.5	97.2	116.9
1977	75.0	110.6	107.5	103.4	77.7	166.5	149.6	97.2	98.2	94.9	121.2
1978	76.6	108.6	98.4	103.9	76.7	175.6	160.1	94.3	99.3	91.4	121.7
1979	79.3	108.9	89.7	107.0	73.7	183.5	175.7	90.3	99.7	89.3	114.1
1980	80.5	110.6	80.2	112.2	71.1	188.1	198.5	87.1	98.7	84.2	113.2
1981	79.6	114.0	76.9	119.8	68.0	208.6	202.2	82.0	94.3	79.9	118.1
Unit labor costs in U.S. dollars											
1970	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1971	91.1	101.3	105.2	96.6	104.3	103.7	104.2	100.0	100.0	101.1	99.5
1972	81.5	102.6	116.1	100.3	106.4	104.6	101.2	102.0	97.7	104.4	102.6
1973	71.1	99.9	129.0	106.0	119.2	100.3	88.9	101.4	107.0	109.9	101.1
1974	70.9	102.1	136.6	99.9	118.6	93.8	93.8	104.9	109.8	111.2	99.4
1975	64.9	103.3	128.8	110.2	109.1	108.5	100.8	107.5	105.0	116.4	110.3
1976	68.1	113.5	127.4	107.6	111.0	95.9	83.5	109.1	109.2	113.9	126.4
1977	66.4	105.2	133.5	102.2	116.9	96.1	91.5	112.2	108.6	116.1	125.0
1978	61.7	93.5	148.2	101.0	122.7	94.2	98.4	111.1	109.0	113.7	112.4
1979	61.8	90.2	123.6	105.1	124.3	95.5	115.4	107.2	108.8	113.2	106.1
1980	62.4	91.5	105.7	110.3	120.2	94.1	143.2	102.8	99.2	106.7	105.9
1981	70.8	95.4	118.7	106.6	107.8	91.1	146.0	92.5	87.6	95.6	106.8

1 Relative indexes are calculated from the ratio of the reference country index to a trade-weighted average index for the other 10 countries.

SOURCE U.S. Department of Labor, Bureau of Labor Statistics. (Reproduced in Patricia Capdevielle, Donato Alvarez and Brian Cooper, "International Trends in Productivity and Labor Costs," *Monthly Labor Review*, U.S. Department of Labor, Washington, December 1982, p. 10).

Table A-4

Performance of Canadian Manufacturing Industries in Respect to the Ratios of Shipments to Apparent Domestic Availability (ADA), Exports to Shipments, and Imports to ADA, 1966-80

	Shipments/ ADA	Exports/ shipments	Imports/ ADA
All manufacturing industries	-	Up	Up
Food and beverage industries	-	Up	Up
Meat and poultry product industries	-	-	-
Slaughtering and meat processors	-	Up	-
Poultry processors	-	-	-
Fish product industry	-	Up	Up
Fruit and vegetable processing industries	-	Up	Up
Dairy products industry	-	-	-
Flour and breakfast cereal product industries	-	-	-
Feed industry	-	-	-
Bakery product industry	-	-	-
Biscuit manufacturers	-	-	-
Bakeries	-	Up	Up
Miscellaneous food industries	-	-	-
Confectionery manufacturers	-	Up	Up
Cane and beet sugar processors	-	-	-
Vegetable oil mills	-	-	-
Miscellaneous food processors, n.e.s.	Down	-	Up
Beverage industries	Down	-	Up
Soft drink manufacturers	-	-	-
Distilleries	Down	-	Up
Breweries	-	Up	Up
Wineries	Down	-	Up
Tobacco product industries	-	-	-
Tobacco product manufacturers	-	-	-
Rubber and plastics product industries	-	Up	Up
Rubber products industries	-	Up	Up
Plastic fabricating industry, n.e.s.	-	-	-
Leather industries	Down	Up	Up
Leather tanneries	Down	-	Up
Shoe factories	Down	Up	Up
Leather glove factories	Down	Down	Up
Luggage, handbag, and small leather goods manufacturers	Down	Up	Up
Boot and shoe findings manufacturers	-	Up	Up
Miscellaneous leather products manufacturers	Down	-	Up
Textile industries	-	Up	Up
Cotton yarn and cloth mills	-	-	-
Wool, yarn, and cloth mills	-	Up	Up
Man-made fibre, yarn, and cloth mills	Down	Up	Up
Cordage and twine industry	Down	Down	Up
Felt and fibre processing mills	-	-	-
Fibre processing mills	-	-	-
Pressed and punched felt mills	-	-	-
Carpet, mat, and rug industry	Up	Up	-
Cotton and jute bag manufacturers	Down	-	Up
Miscellaneous textile industries	-	-	-
Thread mills	-	-	-
Narrow fabric mills	Down	-	Up
Embroidery, pleating, and hemstitch manufacturers	-	-	-
Miscellaneous textile industries, n.e.s.	Up	-	Down
Knitting mills	Down	-	Up
Hosiery mills	Down	-	Up
Knitting mills (except hosiery mills)	Down	Up	Up
Clothing industries	Down*	Up*	Up
Men's, women's, and children's clothing industries	Down	-	Up
Fur goods industry	Up	Up	Up
Foundation garment industry	Down	Down*	Up
Miscellaneous clothing industry	Down	-	Up
Fabric glove manufacturers	Down	Down	Up
Hat and cap industry	Down	Up	Up
Miscellaneous clothing industries, n.e.s.	Down	Down	-

Table A-4 (cont'd.)

	Shipments/ ADA	Exports/ shipments	Imports/ ADA
Wood industries	Up	Up	Up
Sawmills, planing mills, and shingle mills	Up	Up	Up
Veneer and plywood mills	-	-	-
Sash, door, and other millwork plants	Up	Up	-
Sash, door, and other millwork plants, n.e.s.	Up*	Up	Up
Wooden box factories	-	-	-
Coffin and casket industry	Down	-	Up
Miscellaneous wood industries	Up	Up	Up
Furniture and fixture industries	-	Up	Up
Household furniture manufacturers	Down	-	Up
Office furniture manufacturers	Up	Up	Up
Miscellaneous furniture and fixture manufacturers	Up*	Up	Up
Electric lamp and shade manufacturers	-	-	-
Paper and allied industries	Up	Up	Up
Pulp and paper mills	Up	Up	Up
Asphalt roofing manufacturers	Up	Up	-
Paper box and bag manufacturers	-	-	-
Miscellaneous paper converters	Up*	Up	Up
Printing, publishing, and allied industries	-	Up	Up
Commercial printing	-	Up	Up
Primary metal industries	-	-	-
Iron and steel mills	-	-	-
Steel pipe and tube mills	-	Up	Up
Iron foundries	Up*	Up*	Up*
Smelting and refining	-	-	-
Aluminum rolling, casting, and extruding	-	-	-
Copper and copper alloy rolling, casting, and extruding	Down	-	Up
Metal rolling, casting, and extruding, n.e.s.	-	-	-
Metal fabricating industries (except machinery and transportation equipment industries)	-	Up	Up
Boiler and plate works	-	-	-
Fabricated structural, ornamental, and architectural metal industry	-	-	-
Metal stamping, pressing, and coating industry	-	-	-
Wire and wire product manufacturers	Up	Up	Up
Hardware, tool, and cutlery manufacturers	-	Up	Up
Heating equipment manufacturers	-	-	-
Miscellaneous metal fabricating industries	-	Up	Up
Machinery industries (excluding electrical)	-	Up	Up
Agricultural implement industry	-	-	-
Miscellaneous machinery and equipment manufacturers	-	Up	Up
Commercial refrigeration and air conditioning equipment manufacturers	-	-	-
Office and store machinery manufacturers	-	Up	Up
Transportation equipment industries	-	Up	Up
Aircraft and aircraft parts manufacturers	-	-	-
Motor vehicle manufacturers	-	Up	Up
Truck body and trailer manufacturers	Up	-	Down
Motor vehicle parts and accessories manufacturers	-	Up	Up
Railroad rolling stock industry	-	Up	Up
Shipbuilding and repair	Up	Up	Up
Boatbuilding and repair	-	-	-
Miscellaneous vehicle manufacturers	-	Up	Up
Electrical product industries	Down	Up	Up
Manufacturers of small electrical appliances	Down	Up	Up
Manufacturers of major appliances (electric and nonelectric)	-	Up	Up
Manufacturers of household radio and television receivers	Down	Up	Up
Communications equipment manufacturers	Down*	Up	Up
Manufacturers of electrical industrial equipment	Down*	Up	Up
Manufacturers of electric wire and cable	Down	-	Up
Manufacturers of miscellaneous electrical products	Down	Up	Up
Battery manufacturers	Down	Up	Up
Manufacturers of miscellaneous electrical products, n.e.s.	Down	Up	Up
Nonmetallic mineral product industries	-	Up	Up
Clay product manufacturers	Down	-	Up
Cement manufacturers	Up	Up	Up
Stone product manufacturers	-	-	-

Table A-4 (concl'd.)

	Shipments/ ADA	Exports/ shipments	Imports/ ADA
Concrete product manufacturers	Up	Up	-
Glass and glass product manufacturers	-	Up	-
Glass manufacturers	-	-	-
Glass product manufacturers	-	Up	Up
Abrasives manufacturers	Down	-	Up
Lime manufacturers	Up	Up	-
Miscellaneous nonmetallic mineral product industries	Up	-	Down
Refractories manufacturers	-	Up*	-
Miscellaneous nonmetallic mineral product industries, n.e.s.	Up	-	Down
Petroleum and coal product industries	Up	Up	Down
Petroleum refineries	Up	Up	Down
Petroleum refining	Up	Up	Down
Manufacturers of lubricating oils and greases	Up	-	Down
Miscellaneous petroleum and coal product industries	Up	Up	Up
Chemical and chemical product industries	-	Up	Up
Manufacturers of mixed fertilizers	Up	Up	Up
Manufacturers of plastics and synthetic resins	Up	Up	-
Manufacturers of pharmaceuticals and medicines	-	-	-
Paint and varnish manufacturers	Down	-	Up
Manufacturers of soap and cleaning compounds	-	Up	Up
Manufacturers of toilet preparations	Down	Up	Up
Manufacturers of industrial chemicals	Up	Up	Up
Miscellaneous chemical industries	Down	Up*	Up
Miscellaneous manufacturing industries	Down	-	Up
Scientific and professional equipment industries	Down	-	Up*
Instrument and related product manufacturers	Down	Down	-
Clock and watch manufacturers	Down	Up*	Up
Orthopaedic and surgical appliance manufacturers	Down	Up	Up
Ophthalmic goods manufacturers	Down	Up	Up
Jewellery and silverware industry	-	-	-
Sporting goods and toy manufacturers	-	Up	Up
Sporting goods manufacturers	-	Up	Up
Toys and game manufacturers	Down	-	Up
Signs and display industry	Up	Up	Down
Miscellaneous manufacturing industries, n.e.s.	-	Up	Up
Broom, brush, and mop manufacturers	Down	-	Up
Button, buckle, and fastener manufacturers	-	-	-
Floor tile, linoleum, and coated fabrics manufacturers	-	-	-
Sound recording and musical instrument manufacturers	-	Up	Up
Pen and pencil manufacturers	Down	-	Up
Fur dressing and dyeing	-	Up	Up
Other miscellaneous manufacturing industries	-	-	-

- No change.

*Cases where the trend is not certain because of the wide fluctuations over the period.

SOURCE Department of Industry, Trade and Commerce, *Manufacturing Trade and Measures, 1966-1980: Tabulations of Trade, Output, Canadian Market, Total Demand and Related Measures for Manufacturing Industrial Sectors* (Ottawa: Economic Intelligence Branch, Economic Policy and Analysis, Department of Regional Industrial Expansion, 1981).

Table A-5

World Resource Shares in 1963 and 1975

	Year	Resource shares				
		Capital	Skilled labour	Semiskilled labour	Unskilled labour	Arable land
				(Per cent)		
Argentina	1963	1.29	1.73	1.98	0.43	4.36
	1975	1.27	1.57	2.93	0.40	4.83
Australia	1963	1.78	1.26	1.15	0.02	5.40
	1975	1.76	1.26	1.20	0.02	6.41
Austria	1963	0.78	0.79	0.89	0.02	0.26
	1975	0.83	0.58	0.70	0.01	0.22
Belgium and Luxembourg	1963	1.14	1.34	0.93	0.04	0.15
	1975	1.06	0.90	0.80	0.02	0.12
Brazil	1963	1.63	2.88	3.76	5.74	4.69
	1975	2.38	3.82	4.78	6.00	5.12
Canada	1963	3.82	2.53	1.72	0.06	6.45
	1975	3.74	2.55	1.94	0.03	6.12
Colombia	1963	0.35	0.62	1.00	0.78	0.77
	1975	0.33	0.83	1.23	1.00	0.72
Denmark	1963	0.63	0.63	0.56	0.01	0.42
	1975	0.68	0.66	0.48	0.01	0.37
El Salvador	1963	0.03	0.07	0.12	0.24	0.10
	1975	0.04	0.01	0.02	0.02	0.09
Finland	1963	0.70	0.63	0.54	0.01	0.42
	1975	0.72	0.64	0.45	0.01	0.37
France	1963	7.14	6.57	5.25	0.11	3.18
	1975	7.94	6.24	4.49	0.06	2.63
West Germany	1963	9.12	7.08	6.79	0.14	1.29
	1975	8.27	6.56	5.79	0.08	1.13
Ghana	1963	0.09	0.25	0.21	1.15	1.40
	1975	0.05	0.32	0.25	1.19	0.38
Greece	1963	0.32	0.52	0.89	0.42	0.59
	1975	0.48	0.49	0.69	0.32	0.54
Hong Kong	1963	0.08	0.21	0.27	0.19	0.00
	1975	0.12	0.19	0.38	0.09	0.00
India	1963	1.97	12.15	14.88	76.89	24.06
	1975	2.06	14.46	15.95	79.54	23.37
Ireland	1963	0.17	0.27	0.29	0.01	0.20
	1975	0.18	0.23	0.25	0.00	0.15
Israel	1963	0.26	0.34	0.18	0.07	0.06
	1975	0.35	0.43	0.21	0.06	0.06
Italy	1963	4.80	3.44	4.97	0.94	2.35
	1975	4.29	3.25	4.32	0.44	1.72
Japan	1963	7.09	7.84	12.56	0.30	0.90
	1975	14.74	8.62	12.33	0.25	0.78
Korea	1963	0.13	0.57	1.75	1.39	0.33
	1975	0.40	0.75	2.07	1.71	0.34
Mexico	1963	1.07	1.64	2.17	2.06	3.86
	1975	1.59	2.12	2.99	1.44	3.91
The Netherlands	1963	1.51	1.48	1.14	0.02	0.15
	1975	1.46	1.48	1.04	1.01	0.12
Norway	1963	0.67	0.45	0.37	0.01	0.13
	1975	0.64	0.44	0.30	0.00	0.11

Table A-5 (concl'd.)

	Year	Resource shares				
		Capital	Skilled labour	Semiskilled labour	Unskilled labour	Arable land
				(Per cent)		
Panama	1963	0.03	0.07	0.08	0.05	0.08
	1975	0.05	0.08	0.09	0.05	0.08
Philippines	1963	0.31	1.14	2.47	1.37	1.23
	1975	0.40	1.74	3.03	0.97	1.10
Portugal	1963	0.18	0.32	0.58	0.67	0.65
	1975	0.21	0.27	0.51	0.54	0.51
Spain	1963	1.51	1.74	2.78	0.84	3.14
	1975	2.17	1.51	2.51	0.47	2.91
Sweden	1963	1.60	1.58	0.81	0.02	0.50
	1975	1.42	1.35	0.69	0.01	0.42
Switzerland	1963	1.19	0.85	0.68	0.01	0.06
	1975	1.12	0.83	0.63	0.01	0.05
Turkey	1963	0.41	0.95	1.64	4.35	3.98
	1975	0.57	1.30	1.78	4.26	3.95
United Kingdom	1963	5.60	6.97	6.48	0.14	1.13
	1975	4.89	6.44	5.32	0.07	0.98
United States	1963	41.93	29.36	18.27	0.60	27.44
	1975	33.43	26.33	19.09	0.18	29.25
Yugoslavia	1963	0.66	1.71	1.85	0.90	1.727
	1975	0.36	1.75	1.75	0.72	1.12

SOURCE Harry P. Bowen, *Changes in the International Pattern of Factor Abundance and the Composition of Trade* (Washington: U.S. Department of Labor, Bureau of International Labor Affairs, 1980).

Table A-6

Factor Services Embodied in Manufacturing Exports and Imports, 1963-75

	Year	Capital relative to total labour services in: ¹		Skilled labour relative to total labour services in: ²	
		Exports	Imports	Exports	Imports
Argentina	1963	12,193.2	11,408.3	8.5	9.7
	1966	11,644.5	15,793.1	9.9	10.6
	1969	11,188.0	15,437.6	8.7	10.2
	1972	10,466.0	15,189.2	7.9	10.8
	1975	9,298.8	18,920.1	9.3	10.2
Australia	1963	13,464.4	9,872.8	8.7	10.2
	1966	14,424.8	9,205.5	8.7	10.2
	1969	16,222.4	9,208.5	9.6	10.1
	1972	15,984.6	9,362.3	9.9	9.4
	1975	19,268.9	8,755.2	9.8	9.7
Austria	1963	11,967.6	9,967.5	7.1	8.5
	1966	11,033.8	9,815.0	7.0	8.3
	1969	10,818.2	9,664.5	7.2	8.4
	1972	9,791.2	9,188.1	7.3	8.6
	1975	10,455.0	9,075.0	7.6	8.3

Table A-6 (cont'd.)

	Year	Capital relative to total labour services in: ¹		Skilled labour relative to total labour services in: ²	
		Exports	Imports	Exports	Imports
Belgium and Luxembourg	1963	14,183.5	10,421.1	7.8	9.3
	1966	13,928.1	10,620.1	7.2	8.6
	1969	14,561.3	10,830.3	7.4	8.6
	1972	13,874.5	10,197.9	7.6	8.7
	1975	13,839.2	10,077.0	8.1	8.7
Brazil	1963	17,206.1	13,123.8	10.2	12.0
	1966	13,958.7	14,467.1	7.8	11.8
	1969	13,293.7	12,360.0	7.9	11.9
	1972	9,213.6	11,475.9	5.9	11.5
	1975	8,503.9	13,175.5	7.3	11.4
Canada	1963	18,911.9	9,034.0	9.4	9.4
	1966	16,974.8	9,270.3	9.9	10.0
	1969	15,212.7	9,092.2	10.0	10.2
	1972	14,268.2	8,905.1	10.3	9.8
	1975	14,224.1	9,095.3	9.8	9.8
Colombia	1963	13,382.5	12,103.2	4.3	11.7
	1966	13,504.2	14,494.8	6.0	11.4
	1969	12,651.3	13,155.0	6.0	11.1
	1972	10,073.7	12,546.9	5.1	11.4
	1975	9,439.4	14,321.6	5.4	11.2
Denmark	1963	7,441.0	11,051.6	8.6	8.4
	1966	7,476.4	10,520.4	8.7	8.5
	1969	7,819.2	10,460.5	8.7	8.8
	1972	7,278.6	10,323.7	8.4	8.8
	1975	7,368.1	9,992.0	8.8	8.9
El Salvador	1963	7,034.0	10,440.6	4.1	8.7
	1966	6,148.5	10,703.4	4.2	8.7
	1969	8,004.1	12,110.4	5.2	8.7
	1972	7,086.0	11,118.5	5.1	9.0
	1975	7,595.5	11,412.9	5.6	9.5
Finland	1963	18,382.9	10,488.7	6.8	9.4
	1966	18,082.8	10,618.3	6.5	9.3
	1969	14,860.5	10,422.2	6.5	9.2
	1972	13,584.1	9,631.7	6.3	9.5
	1975	12,792.7	9,434.8	6.6	9.7
France	1963	11,041.8	12,053.4	8.2	9.4
	1966	11,060.0	11,610.4	8.8	9.4
	1969	10,809.7	10,963.9	9.0	9.2
	1972	10,088.0	10,907.8	8.7	9.3
Ghana	1963	6,633.3	9,583.4	6.0	7.3
	1966	6,243.8	10,208.8	9.0	8.2
	1969	29,436.1	12,609.6	7.6	8.8
	1972	25,288.1	15,359.0	7.1	9.9
	1975	20,031.4	15,646.0	6.1	9.0
West Germany	1963	10,357.9	11,794.7	9.6	7.7
	1966	10,365.8	11,060.9	9.6	7.7
	1969	10,297.8	11,563.2	9.5	7.9
	1972	9,983.3	10,031.2	9.6	7.7
	1975	10,326.5	9,803.5	9.6	8.0
Greece	1963	9,304.7	10,169.0	7.9	9.3
	1966	12,933.6	9,926.7	5.9	9.8
	1969	19,335.6	8,957.6	6.3	10.2
	1972	13,685.4	9,663.5	5.8	10.0
	1975	12,892.4	9,603.0	5.3	9.2

Table A-6 (cont'd.)

	Year	Capital relative to total labour services in: ¹		Skilled labour relative to total labour services in: ²	
		Exports	Imports	Exports	Imports
Hong Kong	1963	4,281.3	10,207.1	5.5	6.9
	1966	4,293.7	9,486.4	3.9	7.1
	1969	3,899.8	8,889.1	4.3	7.5
	1972	3,729.2	8,554.4	4.5	7.7
	1975	3,791.3	8,752.9	4.6	8.0
India	1963	6,585.5	13,099.5	2.5	11.6
	1966	6,831.7	11,606.3	2.8	11.1
	1969	8,931.3	12,998.7	3.7	11.0
	1972	6,972.5	14,883.8	3.6	11.1
	1975	8,580.4	15,925.7	4.8	12.0
Ireland	1963	6,698.8	10,121.4	5.0	8.7
	1966	7,323.2	10,391.6	6.2	8.9
	1969	6,840.0	9,779.4	7.1	9.2
	1972	7,662.4	9,943.1	7.5	8.5
	1975	8,161.4	9,943.1	8.7	8.7
Israel	1963	8,246.5	11,881.2	5.0	9.6
	1966	9,570.2	11,515.1	6.4	10.3
	1969	8,036.1	11,389.3	6.4	10.4
	1972	7,247.6	11,263.4	6.8	10.0
	1975	9,365.7	12,417.4	8.8	10.3
Italy	1963	7,679.3	12,594.8	7.2	10.0
	1966	8,246.0	12,509.1	7.2	9.7
	1969	7,557.7	12,102.9	7.0	10.3
	1972	7,581.5	11,786.1	7.0	10.0
	1975	8,338.6	11,472.7	7.3	10.2
Japan	1963	8,992.3	11,490.2	7.1	12.1
	1966	9,131.4	12,894.1	7.8	11.6
	1969	9,201.6	12,111.0	8.3	10.9
	1972	9,368.9	9,851.2	9.0	10.6
	1975	10,493.0	9,723.3	9.1	9.8
Korea	1963	11,089.8	13,375.9	3.8	10.1
	1966	5,452.1	12,115.1	3.1	9.6
	1969	4,205.6	10,095.4	3.5	9.8
	1972	5,189.5	10,746.4	3.9	10.2
	1975	5,229.1	11,123.1	4.5	11.0
Mexico	1963	16,721.9	11,286.8	6.9	10.8
	1966	15,205.7	11,516.0	7.7	10.9
	1969	14,027.7	10,716.7	8.8	10.8
	1972	11,674.9	10,180.7	9.0	11.0
	1975	13,463.2	12,234.9	8.8	10.6
The Netherlands	1963	9,769.0	9,995.1	10.0	9.3
	1966	10,047.6	9,829.2	9.5	8.7
	1969	10,485.7	10,026.7	9.7	8.6
	1972	10,796.1	9,586.8	9.6	8.6
	1975	11,154.8	9,662.0	10.0	8.8
Norway	1963	16,830.7	8,606.0	8.2	12.1
	1966	15,903.5	8,923.8	8.2	8.5
	1969	14,272.4	9,504.3	8.1	8.7
	1972	12,500.6	8,608.5	8.3	8.3
	1975	11,367.0	8,440.7	8.4	8.4
Panama	1963	8,890.0	8,956.8	3.4	7.6
	1966	7,087.0	9,734.1	6.1	8.0
	1969	9,927.9	9,744.3	4.6	8.1
	1972	11,484.6	9,352.7	5.5	8.4
	1975	5,295.4	10,091.7	3.2	9.1

Table A-6 (concl'd.)

	Year	Capital relative to total labour services in: ¹		Skilled labour relative to total labour services in: ²	
		Exports	Imports	Exports	Imports
Philippines	1963	6,154.2	12,208.4	2.2	9.7
	1966	6,698.6	12,546.7	2.4	9.5
	1969	9,021.2	12,087.3	3.3	10.0
	1972	8,567.5	12,304.9	3.8	10.6
	1975	12,915.5	11,887.0	4.6	10.8
Portugal	1963	8,611.9	11,745.8	4.6	9.9
	1966	8,261.3	11,041.1	4.7	9.9
	1969	7,161.9	11,106.5	5.0	9.9
	1972	6,443.5	10,201.9	5.6	10.3
	1975	6,831.0	11,182.7	5.8	10.2
Spain	1963	10,331.6	12,503.6	6.7	10.7
	1966	8,628.4	12,320.4	7.0	10.4
	1969	7,813.4	12,742.2	6.3	10.8
	1972	7,556.8	11,629.3	6.0	11.2
	1975	9,081.6	11,974.5	6.7	11.1
Sweden	1963	11,855.4	9,544.1	8.8	8.6
	1966	12,112.5	9,645.3	9.0	8.8
	1969	11,884.0	9,328.2	8.9	8.7
	1972	11,174.6	9,150.8	9.2	8.9
	1975	11,032.6	9,297.5	9.2	8.9
Switzerland	1963	8,643.4	10,455.2	9.2	8.3
	1966	8,815.6	10,198.5	9.3	8.4
	1969	9,093.7	10,136.3	9.6	8.4
	1972	9,530.3	9,646.9	9.7	8.3
	1975	9,418.5	9,785.7	10.1	8.5
Turkey	1963	14,972.9	11,753.2	5.7	10.1
	1966	18,148.1	12,323.1	7.2	10.6
	1969	14,998.3	13,189.8	5.3	11.6
	1972	11,445.4	11,871.5	3.4	11.6
	1975	9,042.9	14,136.2	3.3	10.7
United Kingdom	1963	9,725.4	11,583.9	9.7	8.1
	1966	9,534.9	11,592.7	10.2	8.9
	1969	9,520.1	11,228.2	10.2	9.8
	1972	9,400.3	10,292.2	10.3	9.3
	1975	9,350.0	10,524.6	10.6	9.3
United States	1963	9,334.4	11,828.2	11.5	7.1
	1966	9,687.1	11,536.6	11.7	8.1
	1969	9,602.2	10,296.2	12.4	8.1
	1972	9,078.0	9,752.8	12.6	8.2
	1975	9,201.0	10,209.1	12.4	8.6
Yugoslavia	1963	8,438.9	11,757.1	6.6	10.6
	1966	8,024.7	12,154.2	6.8	9.4
	1969	8,346.9	11,422.7	6.6	9.1
	1972	7,625.5	11,976.1	6.7	9.4
	1975	8,360.0	12,303.5	7.2	9.7

¹ In 1963 U.S. dollars.

² In percentages.

SOURCE Harry P. Bowen, *Changes in the International Pattern of Factor Abundance and the Composition of Trade* (Washington: U.S. Department of Labor, Bureau of International Labor Affairs, 1980).

Table A-7

Revealed Comparative Advantage Index for Canadian Manufacturing Industries, 1962-77

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
300512	0.803	0.648	0.572	0.523	0.420	0.388	0.312	0.277	0.262	0.224	0.184	0.192	0.213	0.214	0.271	0.401
300513	1.671	1.480	1.334	1.406	1.321	1.155	1.046	1.327	1.381	1.336	1.341	1.430	1.273	1.054	1.348	1.565
300514	1.335	1.336	1.366	1.329	1.204	0.905	0.853	0.906	0.917	0.853	0.808	0.937	0.833	0.861	0.862	0.875
300521	0.942	1.081	0.572	0.233	0.182	0.193	0.204	0.179	0.174	0.210	0.309	0.086	0.170	0.104	0.080	0.079
300531	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
300533	0.142	0.093	0.124	0.124	0.160	0.131	0.133	0.134	0.096	0.111	0.144	0.187	0.199	0.288	0.242	0.155
300541	0.247	0.237	0.222	0.269	0.252	0.225	0.174	0.216	0.228	0.218	0.234	0.239	0.242	0.245	0.206	0.225
300551	0.055	0.060	0.054	0.064	0.081	0.084	0.076	0.046	0.061	0.045	0.050	0.052	0.076	0.045	0.038	0.059
300553	0.063	0.160	0.180	0.160	0.119	0.111	0.083	0.081	0.093	0.120	0.098	0.080	0.165	0.111	0.085	0.098
300554	0.083	0.092	0.102	0.082	0.048	0.041	0.025	0.024	0.033	0.029	0.041	0.042	0.035	0.046	0.054	0.061
300561	1.897	2.165	2.155	2.378	2.480	2.302	2.179	2.523	3.531	3.955	3.350	2.886	2.565	2.579	4.400	4.252
300571	0.086	0.202	0.572	0.494	0.677	0.712	0.700	0.502	0.474	0.453	0.470	0.509	0.499	0.330	0.242	0.170
300581	0.395	0.388	0.367	0.274	0.203	0.166	0.147	0.139	0.132	0.122	0.144	0.146	0.110	0.135	0.123	0.157
300599	0.280	0.310	0.241	0.327	0.409	0.347	0.323	0.373	0.274	0.268	0.256	0.252	0.248	0.292	0.231	0.208
300611	0.911	0.703	0.612	0.570	0.474	0.416	0.429	0.349	0.377	0.322	0.264	0.273	0.251	0.311	0.359	0.293
300612	0.615	0.589	0.624	0.248	0.214	0.182	0.167	0.162	0.297	0.256	0.345	0.469	0.360	0.316	0.415	0.409
300613	0.778	0.805	0.780	0.801	0.456	0.357	0.321	0.247	0.232	0.178	0.183	0.234	0.302	0.302	0.298	0.272
300629	0.337	0.439	0.293	0.277	0.284	0.371	0.259	0.234	0.311	0.232	0.321	0.488	0.425	0.514	0.927	0.642
300631	4.475	4.771	4.062	3.684	3.189	2.752	2.378	1.967	1.857	1.789	2.001	1.988	1.748	1.570	1.582	2.061
300632	3.234	3.721	3.299	2.825	2.256	1.978	2.743	2.631	2.116	2.576	2.952	3.117	2.551	2.536	2.815	3.088
300641	10.122	9.665	7.566	7.443	6.664	5.689	4.939	4.967	4.737	4.752	4.836	4.802	4.805	5.377	5.093	5.321
300642	0.336	0.295	0.282	0.280	0.209	0.184	0.185	0.181	0.209	0.182	0.211	0.211	0.254	0.209	0.251	0.232
300651	0.065	0.076	0.102	0.096	0.115	0.057	0.083	0.086	0.091	0.103	0.074	0.076	0.086	0.067	0.051	0.072
300652	0.143	0.164	0.208	0.253	0.219	0.191	0.277	0.210	0.257	0.250	0.245	0.348	0.248	0.192	0.132	0.091
300653	0.112	0.151	0.089	0.085	0.069	0.066	0.086	0.070	0.081	0.096	0.108	0.140	0.201	0.179	0.165	0.137
300654	0.084	0.084	0.078	0.097	0.056	0.037	0.101	0.063	0.063	0.067	0.077	0.062	0.049	0.056	0.065	0.035
300655	0.468	0.464	0.726	0.914	0.586	0.429	0.325	0.346	0.510	0.523	0.592	0.443	0.416	0.305	0.251	0.262
300656	0.127	0.147	0.127	0.167	0.193	0.250	0.253	0.416	0.452	0.450	0.371	0.469	0.344	0.285	0.269	0.216
300657	0.030	0.226	0.264	0.292	0.275	0.213	0.158	0.145	0.156	0.167	0.159	0.168	0.231	0.199	0.256	0.254
300661	0.553	0.714	0.725	0.834	0.776	0.517	0.539	0.911	1.180	1.338	1.534	1.507	1.191	1.053	1.006	1.111
300662	0.506	0.483	0.429	0.395	0.338	0.353	0.272	0.261	0.277	0.241	0.202	0.241	0.194	0.205	0.160	0.154
300663	0.282	0.144	0.126	0.295	0.241	0.150	0.136	0.173	0.178	0.165	0.135	0.194	0.371	0.365	0.292	0.323
300664	0.066	0.088	0.073	0.026	0.023	0.008	0.008	0.039	0.015	0.020	0.090	0.000	0.000	0.000	0.000	0.000
300665	0.020	0.041	0.018	0.068	0.077	0.104	0.295	0.099	0.144	0.270	0.415	0.765	0.647	0.500	0.516	0.499
300666	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
300671	2.645	2.594	2.386	2.123	1.701	1.357	1.306	1.465	1.252	1.337	1.474	1.358	1.276	1.371	1.243	1.716
300672	1.210	1.810	1.610	1.056	0.927	0.658	0.698	0.435	0.297	0.300	0.210	0.156	0.239	0.068	0.155	0.221
300673	0.214	0.307	0.257	0.245	0.290	0.281	0.328	0.335	0.534	0.464	0.417	0.289	0.292	0.314	0.382	0.518
300674	0.552	0.666	0.616	0.629	0.547	0.496	0.428	0.284	0.427	0.469	0.458	0.383	0.384	0.407	0.468	0.528
300675	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
300676	2.088	3.374	4.610	1.852	2.121	2.019	1.214	0.935	1.088	1.404	0.864	1.696	1.687	1.253	1.884	1.739
300677	0.032	0.024	0.016	0.105	0.097	0.107	0.196	0.139	0.161	0.238	0.332	0.477	0.610	0.491	0.505	0.704
300678	0.181	0.165	0.161	0.259	0.305	0.224	0.601	0.360	0.398	0.296	0.247	0.313	0.515	0.472	0.439	0.423
300679	5.688	5.419	5.838	5.782	5.498	4.562	4.168	3.551	3.094	2.569	2.853	4.059	4.297	3.659	4.113	3.922
300681	4.194	3.760	3.585	2.535	2.044	1.779	2.007	1.617	1.451	1.241	1.001	1.327	1.675	2.092	2.606	2.942
300682	3.767	4.009	3.598	2.733	2.493	3.035	2.686	2.139	2.764	3.043	3.200	2.912	2.885	3.693	3.179	2.711
300683	12.892	12.672	11.621	11.952	9.987	8.268	7.525	7.027	8.037	7.426	7.799	8.784	8.905	8.741	8.257	7.820
300684	8.222	7.882	6.795	6.874	5.399	4.940	4.391	3.879	3.598	4.037	3.250	2.766	3.025	2.939	2.293	2.789

Table A-7 (concl'd.)

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
300685	7.066	5.783	5.993	7.504	5.164	4.382	4.038	3.167	2.430	2.292	2.633	2.352	1.675	2.879	2.638	2.803
300686	8.312	7.806	7.747	8.133	6.971	6.291	5.275	5.374	5.195	4.717	4.904	5.903	4.902	5.831	5.845	5.097
300687	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
300688	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
300689	2.485	2.651	2.226	2.083	1.846	1.946	1.553	1.405	1.045	1.136	1.417	1.307	1.083	1.314	1.302	1.166
300691	0.353	0.811	0.806	0.956	1.076	0.731	0.866	0.664	0.881	0.502	0.460	0.580	0.835	0.696	0.789	0.706
300692	0.294	0.441	0.296	0.456	0.289	0.234	0.459	0.533	0.232	0.232	0.371	0.447	0.429	0.211	0.287	0.389
300693	0.253	0.303	0.291	0.808	0.783	0.579	0.219	0.188	0.198	0.271	0.301	0.322	0.401	0.318	0.297	0.255
300694	0.392	0.551	0.770	0.722	0.718	0.742	0.906	0.798	0.820	1.038	1.114	1.230	1.439	1.347	1.398	1.413
300695	0.133	0.157	0.197	0.272	0.246	0.230	0.221	0.261	0.248	0.300	0.304	0.324	0.420	0.383	0.315	0.308
300696	0.451	0.442	0.324	0.430	0.243	0.161	0.117	0.114	0.119	0.194	0.231	0.236	0.258	0.272	0.265	0.271
300698	0.245	0.255	0.275	0.376	0.334	0.349	0.474	0.549	0.532	0.530	0.671	0.681	0.736	0.781	0.657	0.628
300711	1.069	1.148	1.397	1.204	1.736	1.635	1.745	1.810	1.881	2.033	2.049	1.992	1.768	1.813	1.949	1.935
300712	1.636	1.749	1.761	1.951	1.764	1.680	1.297	1.304	1.200	1.443	1.489	1.559	1.739	1.861	1.683	1.536
300714	0.805	0.690	0.719	0.545	0.434	0.455	0.401	0.461	0.516	0.660	0.775	0.765	0.839	0.937	0.928	0.816
300715	0.161	0.183	0.196	0.153	0.210	0.193	0.188	0.227	0.169	0.223	0.220	0.277	0.315	0.324	0.279	0.325
300717	0.196	0.180	0.172	0.165	0.166	0.129	0.119	0.122	0.147	0.135	0.160	0.152	0.142	0.144	0.163	0.171
300718	0.452	0.513	0.500	0.556	0.526	0.443	0.399	0.475	0.397	0.410	0.356	0.383	0.543	0.598	0.493	0.595
300719	0.240	0.257	0.280	0.338	0.330	0.326	0.337	0.371	0.353	0.312	0.320	0.371	0.413	0.385	0.346	0.353
300722	0.277	0.323	0.332	0.340	0.332	0.367	0.348	0.298	0.288	0.274	0.277	0.268	0.335	0.341	0.287	0.233
300723	0.389	0.442	0.768	0.902	0.757	0.674	0.556	0.674	1.300	0.694	0.793	0.490	0.416	0.348	0.263	0.315
300724	0.759	0.668	0.536	0.737	0.837	0.799	0.925	0.845	0.788	0.680	0.554	0.650	0.742	0.706	0.557	0.505
300725	0.273	0.424	0.384	0.388	0.334	0.228	0.223	0.207	0.192	0.144	0.162	0.202	0.269	0.237	0.169	0.152
300726	0.411	0.364	0.484	0.372	0.339	0.457	0.443	0.472	0.400	0.410	0.359	0.381	0.379	0.370	0.405	0.324
300729	0.201	0.202	0.214	0.810	0.790	0.668	0.596	0.540	0.579	0.541	0.508	0.555	0.494	0.474	0.376	0.306
300731	0.313	1.406	1.434	0.369	0.336	0.653	0.573	1.139	1.109	0.809	1.339	1.514	0.790	1.019	1.205	0.611
300732	0.203	0.265	0.441	0.805	1.576	2.275	2.490	2.773	2.590	2.693	2.664	2.696	2.812	2.676	2.697	2.666
300733	0.459	0.478	0.325	0.278	0.323	0.266	0.244	0.214	0.263	0.174	0.231	0.236	0.291	0.217	0.137	0.206
300734	1.524	1.106	2.273	1.879	1.349	1.549	1.310	1.047	1.193	0.456	0.456	1.120	1.019	0.662	0.657	0.719
300735	0.251	0.190	0.192	0.051	0.046	0.045	0.070	0.067	0.085	0.069	0.095	0.344	0.160	0.319	0.203	0.178
300812	0.619	0.660	0.674	0.449	0.366	0.328	0.369	0.414	0.354	0.414	0.413	0.383	0.304	0.342	0.260	0.273
300821	0.257	0.292	0.356	0.387	0.275	0.226	0.264	0.419	0.522	0.477	0.441	0.496	0.509	0.429	0.379	0.382
300831	0.027	0.013	0.043	0.593	0.580	0.240	0.245	0.242	0.231	0.184	0.199	0.287	0.294	0.299	0.242	0.154
300841	0.166	0.171	0.188	0.158	0.130	0.136	0.151	0.206	0.246	0.271	0.262	0.299	0.304	0.220	0.186	0.162
300842	1.118	3.725	3.963	4.148	4.463	4.186	4.097	3.959	3.619	3.331	3.060	3.586	4.077	4.435	3.579	3.391
300851	0.320	0.261	0.223	0.191	0.138	0.125	0.111	0.125	0.162	0.144	0.135	0.185	0.171	0.166	0.171	0.178
300861	0.833	1.190	1.133	0.092	0.076	0.078	0.094	0.097	0.098	0.144	0.178	0.154	0.213	0.252	0.234	0.206
300862	0.290	0.263	0.267	0.314	0.291	0.159	0.183	0.226	0.298	0.299	0.320	0.313	0.318	0.349	0.367	0.280
300864	0.078	0.080	0.071	0.058	0.046	0.051	0.034	0.043	0.051	0.029	0.029	0.041	0.036	0.046	0.066	0.086
300891	0.087	0.077	0.064	0.068	0.042	0.035	0.031	0.033	0.038	0.029	0.033	0.031	0.043	0.053	0.036	0.044
300892	0.315	0.311	0.325	0.314	0.280	0.302	0.288	0.321	0.381	0.396	0.426	0.482	0.606	0.562	0.624	0.530
300893	0.096	0.161	0.139	0.138	0.123	0.134	0.146	0.144	0.162	0.157	0.168	0.202	0.202	0.155	0.152	0.167
300894	0.494	0.527	0.448	0.411	0.338	0.298	0.323	0.438	0.494	0.598	0.571	0.653	0.681	0.601	0.521	0.469
300895	0.280	0.248	0.300	0.148	0.113	0.112	0.088	0.105	0.082	0.055	0.076	0.059	0.049	0.048	0.065	0.053
300897	0.115	0.113	0.176	0.160	0.128	0.144	0.109	0.178	0.197	0.200	0.177	0.188	0.211	0.208	0.115	0.104
300899	0.018	0.015	0.019	0.157	0.237	0.127	0.121	0.122	0.109	0.125	0.137	0.172	0.171	0.169	0.157	0.148

SOURCE: Print-out specially prepared for the Economic Council of Canada from data developed by the U.S. Department of Labor, Washington.

Table A-8

Revealed Comparative Advantage Index for Canada Ranked by Industry, 1962-77

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
300512	26	33	35	37	38	38	47	49	54	59	66	68	68	66	52	39
300513	15	18	22	19	20	20	20	17	15	17	19	18	19	20	18	17
300514	18	20	21	19	21	21	24	23	24	23	24	24	25	24	25	22
300521	22	24	37	66	69	61	60	64	66	62	49	80	77	80	81	82
300531	93	93	93	93	90	93	91	93	93	93	93	92	92	92	89	90
300533	70	71	79	71	72	72	72	72	78	79	74	70	73	58	61	72
300541	59	61	64	61	58	57	65	57	60	61	58	61	65	62	65	59
300551	84	85	86	86	80	80	84	85	85	85	86	85	83	88	87	85
300553	83	73	71	70	76	77	82	81	79	78	80	81	78	79	80	79
300554	79	79	83	85	85	86	88	89	88	86	87	86	88	87	85	84
300561	14	15	16	12	10	10	12	10	6	5	4	8	9	10	4	4
300571	77	64	36	38	30	25	25	31	35	36	32	32	36	47	60	68
300581	40	46	45	59	67	65	69	71	74	77	75	78	81	78	78	71
300599	52	50	61	51	39	44	44	40	52	52	55	59	64	53	64	62
300611	23	28	34	34	35	37	36	43	43	42	53	57	62	53	43	49
300612	30	34	32	64	64	64	66	67	49	53	44	39	48	51	37	38
300613	27	26	25	29	36	41	46	52	58	67	67	64	55	55	46	52
300629	44	44	53	58	54	39	53	54	46	57	46	35	39	32	24	27
300631	7	7	8	8	8	9	11	12	13	13	13	13	12	15	16	13
300632	10	11	12	9	11	13	8	9	11	9	8	6	10	11	8	7
300641	2	2	3	4	3	3	3	3	3	2	3	3	3	3	3	2
300642	45	53	55	56	66	63	63	63	61	66	62	65	61	68	59	58
300651	82	84	78	80	77	83	83	80	80	80	82	82	82	82	86	83
300652	69	70	66	63	63	62	50	59	55	54	57	47	63	72	77	80
300653	74	75	80	82	83	82	81	82	83	81	79	79	72	73	70	77
300654	78	81	81	79	84	87	78	84	84	83	83	83	84	83	83	88
300655	35	40	28	23	31	36	43	44	33	31	28	41	41	54	58	54
300656	72	76	75	68	68	51	54	38	36	37	40	38	49	59	53	61
300657	86	62	59	55	56	59	67	68	71	69	72	74	67	71	57	56
300661	31	27	29	25	27	31	31	22	20	15	15	17	20	21	22	21
300662	33	38	43	43	43	42	51	51	51	55	64	60	74	70	72	74
300663	51	77	76	54	61	68	71	66	65	70	77	67	47	42	48	45
300664	81	80	82	89	89	89	89	87	89	89	82	93	89	90	91	91
300665	88	86	88	84	81	79	48	78	73	51	38	26	30	33	32	35
300666	92	92	92	90	92	92	90	90	92	92	92	90	90	69	92	92
300671	11	14	13	13	17	19	17	15	17	16	17	19	18	16	20	16
300672	19	16	18	21	23	28	26	36	48	45	63	75	66	81	74	60
300673	62	51	60	65	52	49	42	45	29	35	37	54	57	52	39	33
300674	32	31	33	33	33	32	32	48	37	34	34	44	45	38	35	32
300675	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94
300676	13	12	7	17	12	12	19	21	22	22	23	14	14	19	14	15
300677	85	87	89	78	79	78	61	70	70	56	45	37	31	34	33	26
300678	66	69	62	62	50	58	27	42	40	47	56	52	34	36	36	37
300679	6	6	6	6	4	5	5	6	7	10	9	4	4	6	5	5
300681	8	9	11	11	13	15	13	14	14	18	22	20	15	12	11	8
300682	9	8	10	10	9	8	9	11	8	7	6	7	7	5	7	11
300683	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
300684	4	3	4	5	5	4	4	5	5	4	5	9	6	7	12	10

Table A-8 (concl'd.)

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
300685	5	5	5	3	6	6	7	7	10	11	11	11	16	8	10	9
300686	3	4	2	2	2	2	2	2	2	3	2	2	2	2	2	3
300687	91	91	91	91	90	90	92	91	90	90	90	89	91	91	93	93
300688	90	90	90	92	91	91	93	92	91	91	91	91	93	93	90	89
300689	12	13	15	14	14	14	15	16	23	19	18	21	21	18	19	20
300691	43	25	24	22	22	24	23	27	25	32	33	30	24	27	26	25
300692	49	43	52	39	53	53	34	30	38	58	41	40	38	67	49	40
300693	57	52	54	27	26	30	59	62	62	50	51	50	44	50	47	55
300694	41	35	26	31	29	23	22	25	26	20	21	22	17	17	17	19
300695	71	74	67	60	59	54	58	50	56	44	50	49	40	40	45	47
300696	38	42	50	41	60	66	75	76	75	64	59	63	60	60	54	53
300698	60	59	57	46	45	43	33	28	30	30	27	27	28	25	27	28
300711	21	22	20	20	16	17	14	13	12	12	12	12	11	14	13	14
300712	16	17	17	15	15	16	18	18	18	14	16	15	13	13	15	18
300714	25	29	30	36	37	34	37	34	32	27	26	25	23	23	23	23
300715	68	66	68	74	65	60	62	55	67	60	61	56	52	48	51	43
300717	65	67	73	69	70	73	74	75	72	75	71	77	80	77	71	67
300718	37	37	39	35	34	35	38	32	41	39	43	43	33	30	34	30
300719	61	58	56	50	48	46	41	41	45	43	47	46	43	39	44	42
300722	54	48	47	49	47	40	40	40	47	50	52	58	50	46	50	57
300723	42	41	27	24	28	26	30	26	16	25	25	34	42	44	55	46
300724	28	30	38	30	24	22	21	24	27	26	30	29	27	26	30	34
300725	55	45	44	44	46	55	57	60	64	74	70	66	59	63	69	75
300726	39	47	40	47	41	33	35	33	39	40	42	45	46	41	38	44
300729	64	63	65	26	25	27	28	29	28	29	31	31	37	35	41	48
300731	48	19	19	48	44	29	29	19	21	24	20	16	26	22	21	29
300732	63	55	42	28	18	11	10	8	9	8	10	10	8	9	9	12
300733	36	39	48	57	49	50	56	58	53	68	60	62	58	65	76	63
300734	17	23	14	16	19	18	16	20	19	21	14	23	22	28	28	24
300735	58	65	69	88	86	85	85	83	81	82	81	48	79	49	66	66
300812	29	32	31	40	40	45	39	39	44	38	39	42	54	45	56	51
300821	56	54	46	45	57	56	52	37	31	33	35	33	35	37	40	41
300831	87	89	86	33	32	52	55	53	59	65	65	55	56	56	62	73
300841	67	68	70	72	73	70	68	61	57	49	54	53	53	64	67	70
300842	20	10	9	7	7	7	6	4	4	6	7	5	5	4	6	6
300851	46	57	63	67	72	75	76	73	69	72	78	71	75	75	68	65
300861	24	21	23	81	82	81	79	79	77	73	68	76	69	61	63	64
300862	50	56	58	53	51	67	64	56	47	46	48	51	51	43	42	50
300864	80	82	83	87	87	84	86	86	86	88	89	87	87	86	82	81
300891	76	83	84	85	88	88	87	88	87	87	88	88	86	84	88	87
300892	47	49	49	52	55	47	49	46	42	41	36	36	32	31	29	31
300893	75	72	74	76	75	71	70	69	68	71	73	73	71	76	75	69
300894	34	36	41	42	48	48	45	35	34	28	29	28	29	31	36	36
300895	53	60	51	75	78	76	80	77	82	84	84	84	85	85	84	86
300897	73	78	72	71	74	69	77	65	63	63	69	69	70	69	79	78
300899	89	88	87	73	62	74	73	74	76	76	76	72	76	74	73	76

SOURCE: Print-out specially prepared for the Economic Council of Canada from data developed by the U.S. Department of Labor, Washington.

Notes

1 INTRODUCTION

- 1 A very thorough discussion of this subject is contained in William Diebold, Jr., *Industrial Policy as an International Issue* (New York: McGraw-Hill, 1980).
- 2 Economic Council of Canada, *The Bottom Line: Technology, Trade, and Income Growth* (Ottawa: Supply and Services Canada, 1983).
- 3 An excellent recent commentary on the distinction between comparative advantage and international competitive position is contained in Charles Pearson and Gerry Salembier, *Trade, Employment, and Adjustment* (Montreal: Institute for Research on Public Policy, 1983), Chapter 1.

2 ARGUMENTS FOR AND AGAINST

- 1 Some historians suggest that in fact the National Policy was concerned purely with the import tariff and that its linkage with larger objectives is an invention of subsequent observers, who have found more evidence of farsightedness and broad-ranging political purpose than actually existed at the time. If so, that instrument was no more satisfactory as a holistic development policy than today's piecemeal efforts to promote industry. See, for example, Michael Bliss, *The Evolution of Industrial Policies in Canada: An Historical Survey* (Ottawa: Economic Council of Canada, Discussion Paper No. 218, 1982), pp. 16-21.
- 2 Economic Council of Canada calculations. Needless to say, these figures understate the degree of protection afforded an economy since the highest tariffs tend to inhibit trade entirely. That is, any average of the incidence of barriers to imports will obviously fail to measure trade that does not occur at all because of such obstacles.
- 3 The Industrial and Regional Development Program announced by the federal government in 1983 added further to the scope of subventions and loans brought to bear in the campaign for more vigorous industrial renewal in Canada – though it is only fair to note that it did simplify the system somewhat.

3 VULNERABILITY OF MANUFACTURING

- 1 In the past year or so some valuable new contributions have been made on the subject under Economic Council auspices by Gorecki and Baldwin, several of which are now available in Council Discussion Papers. The Council has also co-operated with the Royal Commission on the Economic Union and Development Prospects

for Canada (the Macdonald Commission) in further studies of related questions by these authors. (It might be noted, too, that additional relevant research has been undertaken for the Macdonald Commission, involving Harris and others).

- 2 Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (New York: Modern Library edition by Random House, 1937), p. 3.
 - 3 *Ibid.*
 - 4 Stefan Stykolt and Harry C. Eastman, "A Model for the Study of Protected Oligopolies," *Economic Journal*, Cambridge, Vol. 70, June 1960, pp. 336-347.
 - 5 F. M. Scherer *et al.*, *The Economics of Multi-Plant Operation* (Cambridge: Harvard University Press, 1975), pp. 80 and 94.
 - 6 B. Stein and M. Hodax, *Competitive Scale in Manufacturing: The Case of Consumer Goods* (Washington: Center for Community Economic Development, 1976).
 - 7 Paul K. Gorecki, *Economies of Scale and Efficient Plant Size in Canadian Manufacturing Industries*, (Ottawa: Supply and Services Canada, 1976).
 - 8 *Foreign Direct Investment in Canada* (Ottawa: Information Canada, 1972).
 - 9 *Ibid.*, p. 405.
 - 10 *Uncertain Prospects: Canadian Manufacturing Industry, 1971-1977*, a report of the Science Council of Canada (Ottawa: Supply and Services Canada, 1977).
 - 11 John N. H. Britton and James M. Gilmour, *The Weakest Link: A Technological Perspective on Canadian Industrial Underdevelopment*, Science Council of Canada Background Study No. 43 (Ottawa: Supply and Services Canada, 1978).
 - 12 *Ibid.*, pp. 97-98.
 - 13 *Ibid.*
 - 14 Richard D. French, *How Ottawa Decides: Planning and Industrial Policy-Making 1968-1980* (Ottawa: Canadian Institute for Economic Policy, 1980).
 - 15 Calculated from data in "Importance of Being Earnest About Further GATT Negotiations," *The World Economy* (London: Trade Policy Research Centre, September 1979), p. 328.
- ### 4 IS CANADA DEINDUSTRIALIZING?
- 1 Robert Bacon and Walter Eltis, *Britain's Economic Problem: Too Few Producers* (London: The Macmillan Press, 1976).

5 COST/PRICE PERFORMANCE

- 1 See especially D.J. McCulla, "Evaluating Measures of Canada's Industry Trade Performance: Comparative Advantage and Competitiveness," Economic Intelligence Branch, Economic Policy and Analysis, Department of Industry, Trade and Commerce, December 1980.
- 2 Some data for 1982 not shown in Table 5-7 indicate just this, the U.S. figure being up to \$11.79 and the Canadian to \$10.77, while all others are below those levels (from the German at \$10.43 to the Japanese at \$5.82).
- 3 James G. Frank, *Assessing Trends in Canada's Competitive Position: The Case of Canada and the United States* (Ottawa: The Conference Board of Canada, 1977). The Board is working on a new analysis of this question. Some extremely useful material on productivity in Canada's manufacturing industries, although not specifically related to competitive performance, is contained in Uri Zohar, *Canadian Manufacturing: A Study in Productivity and Technological Change* (Ottawa: Canadian Institute for Economic Policy, 1982), two volumes.
- 4 See also Paul and Ronald J. Wonnacott, "Free Trade Between the United States and Canada: Fifteen Years Later," *Canadian Public Policy*, Guelph, October 1982, p. 417.

8 AREAS OF COMPARATIVE ADVANTAGE

- 1 Harry H. Postner, *Factor Content of Canadian International Trade: An Input-Output Analysis*, Economic Council of Canada Research Study (Ottawa: Supply

and Services Canada, 1975), and *Canada and the Future of the International Economy: A Global Modeling Analysis*, Discussion Paper No. 129 (Ottawa: Economic Council of Canada, 1979).

- 2 Harry P. Bowen, *Changes in the International Pattern of Factor Abundance and the Composition of Trade*, Economic Discussion Paper No. 8 (Washington: U.S. Department of Labor, Bureau of International Labor Affairs, 1980).
- 3 *Report of the President on U.S. Competitiveness* (Washington: U.S. Department of Labor, Office of Foreign Economic Research, 1980).
- 4 The reference here is mainly to Postner's 1975 study, although the later analysis carried the work forward and revealed some new indications of relevance to Canada's future position.
- 5 These tabulations were made available to the author by staff of the Bureau of International Labor Affairs, U.S. Department of Labor.
- 6 An American supporter of this explanation, as applied to the U.S. situation, is Gregory Schmid, in "Productivity and Reindustrialization: A Dissenting View," *Challenge*, Armonk, N.Y., January/February 1981, p. 24.

9 CONCLUSION

- 1 See Donald J. Daly, *Canada's Comparative Advantage*, Discussion Paper No. 135 (Ottawa, Economic Council of Canada, 1979), pp. 18-20.

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Bibliography

- ASTWOOD, D. M. "Canada's Merchandise Trade Record and International Competitiveness in Manufacturing, 1960-1979." In *International Business: A Canadian Perspective*, edited by K. C. Dhawan et. al. Don Mills: Addison-Wesley Publishers, 1981, pp. 48-73.
- BALDWIN, J. R; and GORECKI, P. K. *Trade, Tariffs and Relative Plant Scale in Canadian Manufacturing Industries, 1970-1979*. Discussion Paper No. 232, Ottawa: Economic Council of Canada, 1983.
- BECKMAN, C. C. *Canada's International Trade Performance: A Survey of Recent Trends*. Executive Bulletin No. 23, Ottawa: The Conference Board of Canada, 1982.
- BLOCH, H. "Prices, Costs and Profits in Canadian Manufacturing: The Influence of Tariffs and Concentration." *Canadian Journal of Economics*, Toronto, November 1974, pp. 594-610.
- BRITTON, J.N.H; and GILMOUR, J. M. *The Weakest Link: A Technological Perspective on Canadian Industrial Underdevelopment*. Ottawa: Science Council of Canada, 1978.
- CAVES, R. E. *Diversification, Foreign Investment, and Scale in North American Manufacturing Industries*. Ottawa: Economic Council of Canada, 1975.
- DALES, J. H. *The Protective Tariff in Canada's Development*. Toronto: University of Toronto Press, 1966.
- DALY, D. J., KEYS, B. A; and SPENCE, E. J. *Scale and Specialization in Canadian Manufacturing*. Staff Study No. 21, Ottawa: Economic Council of Canada, 1968.
- DALY, D. J. *Canada's Comparative Advantage*. Discussion Paper No. 135, Ottawa: Economic Council of Canada, 1979.
- . "Theory and Evidence on Canada's Comparative Advantage." In *International Business: A Canadian Perspective*. Edited by K. C. Dhawan et. al. Don Mills: Addison-Wesley Publishers, 1981, pp. 32-47.
- DAUPHIN, R. *The Impact of Free Trade in Canada*. Ottawa: Economic Council of Canada, 1978.
- EASTMAN, H. C. and STYKOLT, S. *The Tariff and Competition in Canada*. Toronto: Macmillan, 1967.
- ECONOMIC COUNCIL OF CANADA. *Looking Outward: A New Trade Strategy for Canada*. Ottawa: Information Canada, 1975.
- ENGLISH, H. E. *Industrial Structure in Canada's International Competitive Position*. Montreal: Canadian Trade Committee, 1964.
- FRANK, J. G. *Assessing Trends in Canada's Competitive Position: The Case of Canada and the United States*. Ottawa: The Conference Board of Canada, 1977.
- GASSEND, M. "Canada's International Trade Performance of Manufacturing Industries by Levels of Research Intensity." Draft report, Ministry of State for Science and Technology, Policy Research Group, Ottawa, 1982.
- GILMOUR, J. "Industrialization and Technological Backwardness: The Canadian Dilemma." *Canadian Public Policy*, Guelph, Winter 1978, pp. 20-33.
- GORDON, M. "A World Scale National Corporation Industrial Strategy." *Canadian Public Policy*, Guelph, Winter 1978, pp. 46-56.
- GORECKI, P. K. *Economies of Scale and Efficient Plant Size in Canadian Manufacturing Industries*. Ottawa: Consumer and Corporate Affairs Canada, 1976.
- MAGEE, S. P. "Theories of Comparative Advantage." In *International Business: A Canadian Perspective*, edited by K. C. Dhawan et. al. Don Mills: Addison-Wesley Publishers, 1981, pp. 20-31.
- MATTHEWS, R. A; and MOROZ, A. R. "The Impact of Imports from Japan on Canadian Manufacturing." In *Canadian Perspectives on Economic Relations with Japan*, edited by K.A.J. Hay, Montreal: Institute for Research on Public Policy, 1980, pp. 207-268.
- MINISTRY OF STATE FOR SCIENCE AND TECHNOLOGY. *Canadian Trade in Technology-Intensive Manufactures, 1964-76*. Background Paper 5, Ottawa: MOSST, July 1978.
- POSTNER, H. H. *Factor Content of Canadian International Trade: An Input-Output Analysis*. Ottawa: Economic Council of Canada, 1975.
- PRATTEN, C. *Economies of Scale in Manufacturing Industries*. London: Cambridge University Press, 1971.
- SCHERER, F. M.; BECKENSTEIN, A; KAUFER, E.; and MURPHY, R. D. *The Economics of Multi-Plant Operation: An International Comparisons Study*. Cambridge: Harvard University Press, 1975.
- SCIENCE COUNCIL OF CANADA. *Uncertain Prospects: Canadian Manufacturing Industry, 1971-1977*. Ottawa: Supply and Services Canada, 1977.
- . *Forging the Links: A Technology Policy for Canada*. Report No. 29, Ottawa: Supply and Services Canada, 1980.
- SHEPHERD, J. J. *The Transition to Reality: Directions for Canadian Industrial Strategy*. Ottawa: Canadian Institute for Economic Policy, 1980.
- STEIN, B; and HODAX, M. *Competitive Scale in Manufacturing: The Case of Consumer Goods*. Washington: Center for Community Economic Development, 1976.

WILKINSON, B. W. "Canada-U.S. Free Trade and Some Options." *Canadian Public Policy*, Guelph, October 1982, pp. 428-439.

———. *Canada in the Changing World Economy*. Montreal: C. D. Howe Research Institute, 1980.

WILLIAMS, J. R. *The Canadian-United States Tariff and Canadian Industry*. Toronto: University of Toronto Press, 1978.

WONNACOTT, R. J. *Canada's Trade Options*. Ottawa: Economic Council of Canada, 1975.

WONNACOTT, P., and WONNACOTT, R. J. "Free Trade Between the United States and Canada: Fifteen Years

Later." *Canadian Public Policy*, Guelph, October 1982, pp. 412-427.

———. *Free Trade Between the United States and Canada: The Potential Economic Effects*. Cambridge: Harvard University Press, 1967.

YOUNG, J. H. *Canadian Commercial Policy*. Royal Commission on Canada's Economic Prospects, Staff Study 32, Ottawa: The Queen's Printer, 1957.

ZOHAR, U. *Canadian Manufacturing: A Study in Productivity and Technological Change*. Ottawa: Canadian Institute for Economic Policy, 1982.

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