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ECONOMIC COUNCIL OF CANADA

## Seventh Annual Review

# PATTERNS OF GROWTH

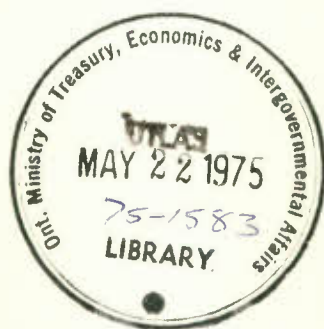
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*ECONOMIC COUNCIL OF CANADA*

## Seventh Annual Review

### PATTERNS OF GROWTH

*September 1970*

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### *General Notes on Tables and Charts*

Unless otherwise noted, all dollar data are in current dollars.  
Detail in tables may not add to total because of rounding.

## *Introduction*

ONE OF THE Council's principal duties is to advise on how to achieve high, stable, sustained and widely shared growth in the economy. This mandate implies that economic growth, especially productivity growth, provides an essential basis for meeting human needs and aspirations of many kinds—not only those reflected in material living standards, but also broader human and social aims in health and education, the reduction of large-scale poverty, and other diverse goals. Since the inception of our work, we have devoted considerable effort to the development of improved understanding of the nature and sources of growth. In this Review, we continue our work in this field by focusing attention on industrial growth patterns.

It is a sign of the times, however, that any discussion of economic growth must indicate why it is relevant and important. The debate about human and social values and goals is gaining momentum. There has, in fact, been emerging criticism of economic growth, posing the key issue, “Does *bigger* really mean *better*?” An answer to this question would lead us back over the history of human development, in and out of the highways and by-ways of politics, economics, and statistics, and into the realm of philosophy—well beyond the range of this Annual Review.

That economic growth, as it is conventionally estimated, is a questionable indicator of human welfare is, of course, not a new notion. Few societies or individuals have failed to make some distinction between maximum and desirable growth. The goals of all societies include a wide range of human values that are not

## *Patterns of Growth*

adequately reflected in measurements of their gross national products. Few major decisions of governments, business firms or individuals are made on the basis of economic considerations alone, and fewer still on the sole criterion of maximizing output or income.

By the end of the 1960's, after a decade of remarkable economic growth, misgivings about the possible undesirable effects of growth were being extended to a growing range of human, environmental and resource problems. While some elements of the emerging debate have been highly subjective and imbalanced, the discussion has nevertheless drawn widespread attention to the urgent need for a more comprehensive assessment of the social benefits and costs associated with the presence (or absence) of economic growth. Social costs and benefits now enter into decisions about the use of productive resources in only a partial and unsystematic way. However, public awareness of these issues is an important first step towards devising ways to take them more explicitly into account in future decisions. This is a matter to which we will be giving some attention in our next Annual Review.

The Council has, of course, already sought to place the developing debate on social goals in the context of the need for clarification of "achievement goals" for Canada, as emphasized in our last Annual Review. Our view is that a national consensus on goals should be pursued through public discussion and the democratic process, supported by good information and more systematic research.

Beneath these larger issues there remains the basic economic imperative—the need for efficient use of scarce resources to satisfy a multiplicity of wants. This requirement may become more acute as our social needs become more fully and clearly understood. Even in the circumstances of considerable affluence resulting from past economic growth—perhaps *especially* in these circumstances—Canadians have a large and growing array of wants and needs for themselves, their families, their communities, and the whole society. The satisfaction of these growing aspirations will require the provision of growing amounts of goods and services. Thus we cannot afford the luxury of not using limited resources as effectively as possible to meet personal and collective goals, however these goals are defined and ordered.

Up to now, the Council's appraisal of growth has been concerned largely with the *overall* growth of the economy. This has provided an essential framework for appraising the economy's potentials and performance, and has given insights into the underlying sources of

## Introduction

growth and general policies affecting growth. For these purposes, the analysis has necessarily dealt in large national or regional averages and aggregates—aggregates such as Gross National Product that encompass millions of individual transactions and decisions. Despite all the advantages of such an approach, it masks many important details and features of the growth process. It is essential to probe beneath these national totals and averages, and look at economic performance in the various industrial sectors to understand more clearly how growth is generated.

It is the principal purpose of this Review to move towards a better understanding of growth in this perspective. In attempting to do so, we are very conscious of the partial nature of the analysis that can be made on the basis of available information and research. Indeed, in many ways, the analysis in this Review will make it evident that there is still much to learn regarding the complexities of our economic system.

The analysis is directed mainly at clarifying the basic elements in growth—labour and capital, and the efficiency with which these have been used—in major groups of industries over the past two decades. In view of the great variations in the quantity and quality of data, and considering the nature of the activities carried on within these industry groups, the analysis cannot be uniform. But each of these “sector sketches” is directed, in terms of its particular framework of information and analysis, to illuminating the basic elements of growth and to drawing special attention to the effectiveness with which resources are used—that is, essentially to *productivity*.

Although productivity is the key to economic growth, it should not be regarded as an overriding goal. That would make life unacceptably narrow and austere. Furthermore, factors influencing productivity are only some of the complex variables affecting economic growth and industrial capabilities. Many others are also involved (some of them interrelated with productivity changes), such as changing demands for various products and services; profitability; and the shifts taking place in prices and costs—for example, the changes that have taken place over the past two decades in the prices of automobiles relative to those of public transportation, in the price of chicken relative to beef, and in the prices of machinery and equipment in relation to wages.

Subject to these limitations, however, some insights can be gained into the nature of growth and some of the factors affecting it in different parts of the economy. What emerges is a wide diversity



## *Patterns of Growth*

in patterns of growth—some sectors and industries having large and swiftly growing total output, others with slow output growth; some drawing heavily on rising inputs of labour (but frequently of different types and qualities) as a source of growth, others depending heavily on capital inputs and sometimes becoming rapidly more capital-intensive. Again some sectors have achieved strong advances in their efficiency of use of labour and capital; others have apparently lagged or been unable to make substantial productivity gains. There is clearly no simple, standard “model” of growth having wide application across all industries. All of this confirms that economic growth is a highly uneven process reflecting differing combinations of forces and conditions in various parts of the economic system.

In the past, between our periodic assessments of the medium-term potentialities for Canadian growth, we examined some of the forces affecting the growth of the economy as a whole, so that we could successively improve our capacity to anticipate, in broad terms, the dimensions of these potentialities, along with some of the major problems and opportunities of the future. By focusing attention at this time on industrial growth patterns, we are taking some initial steps towards the future development of potential output analysis on an industry basis, taking into account various important interrelationships between industries. Such analysis should provide, by industries, estimates of future growth of output, investment and employment, consistent with potential output for the whole economy. Much remains to be done to carry this task forward, not only by the Council but also by others. This will be a matter of high priority on our agenda of work for the 1970's. The evolving results from such a *comprehensive* and *systematic* assessment of future structural changes should have far-reaching implications for many different aspects of both public policy formulation and private decision-making. For example, they would have relevance to the growing range of industrial and manpower policies of both federal and provincial governments; they would also have relevance for investment, production, marketing and many other decisions of private organizations.

In this Review, Chapter 2 provides a comprehensive view of growth and productivity in the major sectors of the economy—a broad-brush fresco of industrial growth and change in the Canadian economy over the past two decades. Chapters 3 through 5 then take a closer look at a few of the largest and fastest-growing sectors—manufacturing, mining, retail and wholesale trade, health services, and higher education. Agriculture was the subject of a chapter in

## *Introduction*

our *Fifth Annual Review*. In Chapter 6, we consider commercial policy issues for the 1970's against a setting of international and national growth. Some of the more detailed data underlying the analysis are contained in a Statistical Appendix. Also, a number of studies setting out technical information and analysis will be published separately.

Unlike our earlier Reviews, this Review does not contain a chapter assessing the performance of the economy in relation to the medium-term goals delineated by the Council. In some respects, the Canadian economy has not been performing as well over the past year as most Canadians would wish. In the light of this, we have concluded that this year we should undertake a somewhat fuller assessment of the economy's performance—both its actual performance in the 1960's, and its progress towards the medium-term goals outlined in our *Sixth Annual Review*. Moreover, it appeared to us that there would be advantages in presenting such an appraisal in a separate document, especially since such an assessment would not be directly related to the main theme of this Review, and since the preparation of a separate document would allow us to carry forward our program of work in a more timely and orderly way.

## 2

### *Growth, Efficiency and Structure*

**T**HIS CHAPTER looks at the growth of output in different parts of the economy. It focuses attention on the components of growth, and shows how the compounding of different rates of growth in different sectors over a period of about 20 years has resulted in an economic structure quite different from what it was, and from what many people perhaps still think it to be.

#### PATTERNS OF GROWTH

The decision to look at *parts* of the economy is no sooner taken than we run up against a problem of definition and selection. What parts? For our purposes here, we have chosen 10 "industry" groups under three broad headings:

- the *primary* industries, with agriculture, forestry, and fishing treated here as one group;
- four groups of *other goods-producing* industries, namely mining, oil, and gas; manufacturing; construction; and utilities;
- five *service* industries, namely transportation, storage and communication as one group; "trade", meaning in this case wholesale and retail trade; finance, insurance, and real estate as a third group; community, business and personal services as the fourth; and finally, public administration.

Most of these industry labels are self-explanatory. A few, though, require clarification. For example, "utilities" include electric power, gas and water utilities. But the telephone companies are grouped with radio and TV stations in "communications". And while most

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people would think of communications as including newspapers and telegraph services, the newspapers are actually grouped under "printing and publishing" in the "manufacturing" category, and telecommunications are in "transportation" because it is virtually impossible to separate them from railway operations. Probably the greatest variety of "industries" comes under the category of "community, business and personal services". Here will be found not only education and health care, each the subject of a chapter later in this Review, but also a *mélange* of services such as those of lawyers, accountants, consulting engineers, beauty and barber shops, repairmen, hotels and motels, restaurants, service stations and theatres. Obviously, many people would choose other groupings. The ones used here are those used in the country's National Accounts; they reflect the way that statistics of economic activity are compiled.

To get another definitional problem out of the way, the measurement of output growth in these industry groups is essentially the growth of "value-added". This measures the total sales of firms in an industry, less the value of items purchased from other industries, so that double-counting of production is avoided. Thus the value-added of an industry consists mainly of payments for the use of labour and capital, and of profits. But some service industries do not produce an easily definable product, so that in trying to express their "output" in conventional economic terms, the statistician must fall back on information about their "inputs"—that is, the amounts of wages and salaries they have paid, plus an allowance for capital depreciation. This is far from adequate, we agree. But at the moment there is no other way.

Chart 2-1 shows trends in annual growth rates of output by industry groups for the 1946-67 period. With the exception of the primary group, the overall growth rates in current dollars for all industries fall into a range of 7 to 10 per cent. For agriculture, forestry, and fishing combined, the growth rate is only about 2 per cent over this period. These trends do not reflect short-term swings in individual industries, and would not be significantly affected by data for the past two or three years if they had been available for analysis.

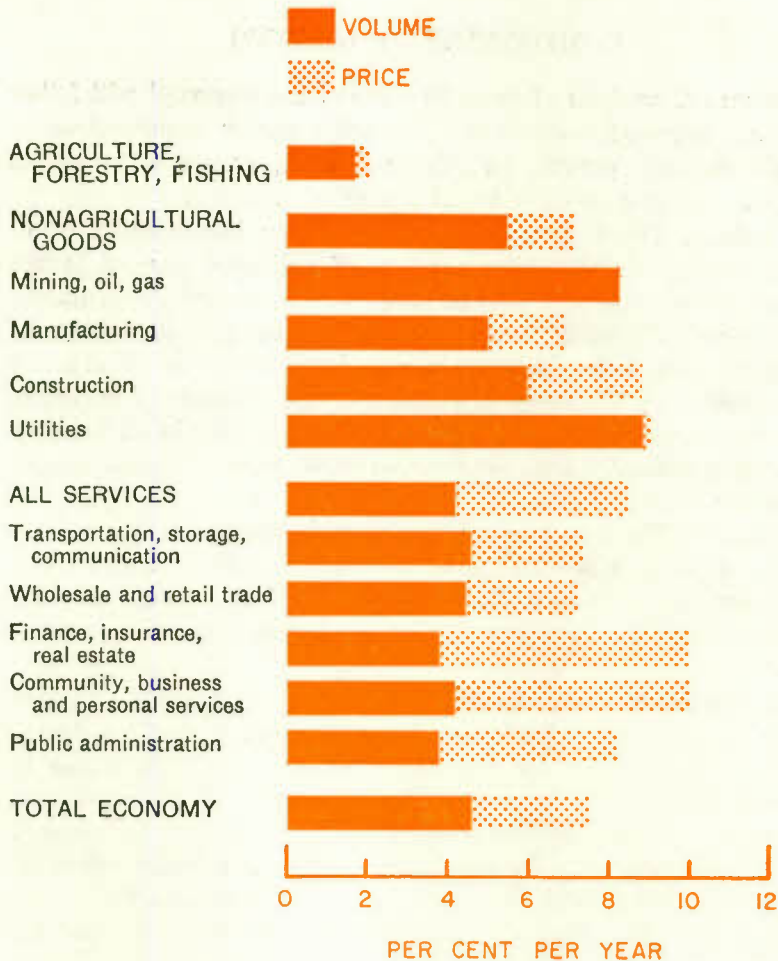
The chart also shows a rough estimate of what portion of the overall growth rate was due to price increases. The general pattern is that the output of the goods industries grew more rapidly in real terms, and had a lower price component. Utilities and mining had the highest rates of growth in real output, and relatively very small



## Growth, Efficiency and Structure

increases in prices. In the service industries, the price advance was generally much more pronounced—a matter to which we will return later.

CHART 2-1  
GROWTH OF OUTPUT, 1946-67



Source: Trend rates based on data from Dominion Bureau of Statistics.

As interesting as this picture of differing growth rates may be, it remains superficial. The object should be to get inside the growth rates of real output and, if possible, find out *why* the growth rates differ. A thorough answer to that question would help provide the

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necessary policy clues for maximizing growth in those places that have the greatest potential, and for making the most efficient use of the country's growing but still limited resources. This is the subject to which we now turn. The following analysis does not provide complete answers, but it does portray some of the significant elements.

### COMPONENTS OF GROWTH

The growth analysis of these 10 parts of the economy<sup>1</sup> will follow the same approach used in the Council's earlier examinations of overall economic growth. In this framework, growth is traced to changes over time in three broad groups of elements:

1. *Labour*. The largest element in changing labour input is, of course, changes in the sheer numbers of employed persons in the various industries. But it also includes, in this analysis, adjustments for changes in average hours worked, and changes in degrees of experience and skills. Changes in experience levels in an industry are estimated by the proxy of changes in age structure of employed persons. Changes in the level of knowledge and skills in an industry are roughly estimated from information on the years of formal schooling among employed persons.

2. *Capital*. The measurement used here is changes in the volume of gross capital stock—that is, in the total inventory of structures, machinery and equipment. But such estimates are difficult to make, and those used here are based on a number of important assumptions.<sup>2</sup>

3. *Factor Productivity*. By this is meant the *efficiency* with which labour and capital together are used in production. Part of the growth in factor productivity for the total economy has been traced in previous studies to the effects of growing markets on scale and specialization, and the effects of resource shifts—especially the long-run shift of manpower from the relatively low-income primary industries to higher-income activities in other parts of the economy. But at the industry level, this kind of measurement of the separate elements

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<sup>1</sup>For more detailed information on growth in these 10 major industry groups, together with a description of the concepts and measures used in the analysis, see Wolfgang M. Illing, *Sources of Growth in Canadian Industries, 1946-68*, Economic Council of Canada Staff Study No. 29, Ottawa, Queen's Printer, forthcoming.

<sup>2</sup>One of these is that the capital stock is used at full capacity (in Canada, there are no statistics on capital utilization analogous to the unemployment rate in the labour force). Another is that we are unable to make an allowance for quality improvements in new structures, machinery and equipment—at least not beyond those improvements reflected in price increases.

## *Growth, Efficiency and Structure*

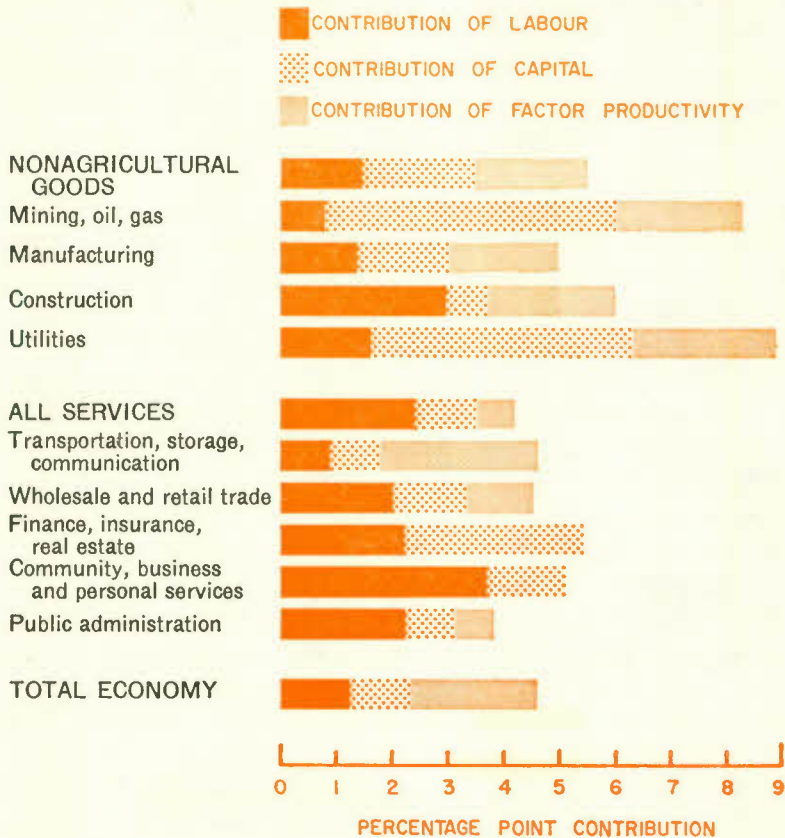
of factor productivity growth would be much more difficult, especially on the basis of available information. In most industries, as at the national level, increases in factor productivity arise from a very wide range of influences, such as economies of scale and specialization, degrees of competition, improvements in technology, the effectiveness of management, changes in demand, and market reactions to changes in relative prices between one product and another, to name only a few.

The results of the analysis are illustrated in Chart 2-2, showing for each of nine industry groups the contributions made by each of the three main components. In the case of the tenth group—agriculture, forestry, and fishing, not shown in the chart—labour input declined, while both capital inputs and factor productivity made significant contributions to growth. (Appendix Table A-1 shows more detailed data on growth rates of outputs and inputs for all of these industry groups, and the estimated contributions of inputs and factor productivity to the growth of output in the groups.) One of the most striking features indicated by the chart is the considerable variation in the relative importance of the growth elements.

There appears to be an association between the scale of price increases indicated in some industries over the 1946-67 period, and the extent to which these industries relied on particular growth elements more than others. In general, price increases were less pronounced in the industry groups that experienced relatively high rates of growth in factor productivity. Price increases were highest over that period (Chart 2-1) in the construction, trade, public administration, financial, and community, business and personal service industries. As Chart 2-2 indicates, these are industries that generally obtained much of their growth over the postwar period with higher labour inputs and relatively little improvement in factor productivity. In fact, the analysis suggests that in the two service industries which had the highest rates of price increase—finance, insurance, and real estate; and community, business and personal services—there was no improvement at all over the two decades in their efficiency in relation to inputs of both labour and capital. Appendix Table A-1 indicates a decline in measured factor productivity in these two groups of industries (a decline not shown in Chart 2-2); but an important caution is necessary here—data deficiencies tend to underestimate measured growth in real output and factor productivity and to overstate price increases commensurately. Similar biases exist in the measures for some other sectors, such as public administration.

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CHART 2-2  
COMPONENTS OF REAL OUTPUT GROWTH, 1946-67



Source: Based on data from Dominion Bureau of Statistics and estimates by Economic Council of Canada.

In the mining and utilities groups, Chart 2-2 indicates that increases in capital stock accounted for well over half their total growth in the 1946-67 period, and that both groups had substantial gains in factor productivity. As illustrated previously, these two industries had the lowest rates of price increase over that period.

A word should be added here about the nature of the large labour input in most of the service industries. While employment in these industries rose faster than in other parts of the economy, average hours worked declined more than in the goods industries, due mainly to large increases in female part-time employment in trade and in community, business and personal services. Also, the combined

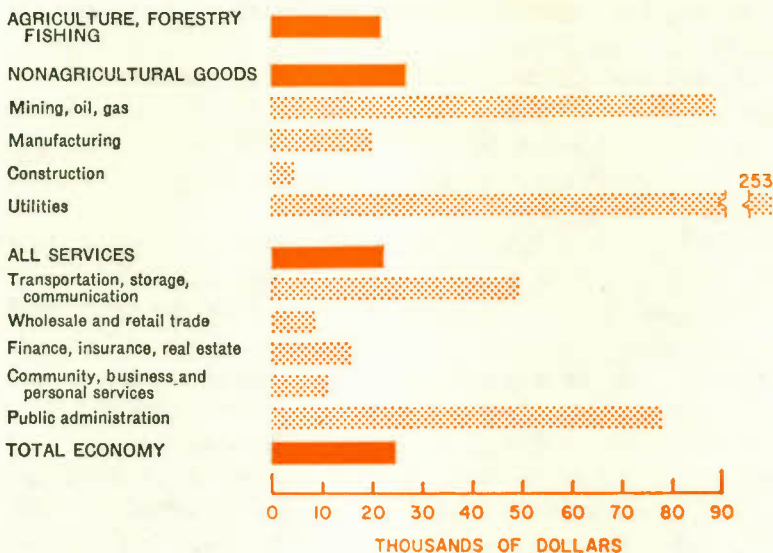


## Growth, Efficiency and Structure

gains from increased education and experience were smaller in the service industries than in the goods industries. However, these disparities are overshadowed by the huge increases in employment in the service industries.

As Chart 2-2 also indicates, a relatively low contribution of capital to growth does not preclude a relatively good performance in factor productivity. The transportation, storage, and communication industry, with a fairly small reliance on capital stock *increases* for its overall growth, experienced a situation in which factor productivity accounted for about 60 per cent of its total gain in average annual real output over the two decades. The relatively low increase in capital per worker in transportation is undoubtedly partly attributable to the growth in private ownership of cars, which are not included in the capital stock data. The construction industry, too, had a substantial productivity gain without a large increase in capital stock. The relatively small growth that apparently took place in capital-intensity in the construction industry is not so easy to explain, especially in view of technological advances, including considerably greater use of labour-saving machinery.

CHART 2-3  
CAPITAL STOCK PER EMPLOYED PERSON, 1967



Note: Excludes residential capital stock.

Source: Based on data from Dominion Bureau of Statistics.

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Between these two industry groups, however, and among the others, the degree of capital-intensity (that is, capital stock per employed person) varied widely, as shown in Chart 2-3. These differences are determined largely by the nature of the activities carried on within each of these major groups of industries, and by basic technological factors. The high level of capital per employed person in public administration reflects, among other things, the inclusion of highways, bridges and public buildings (but not military hardware).

Up to this point, we have been dealing chiefly with *annual rates* of change in different parts of the economy. When these rates are compounded every year for two decades, the relative weight of each industry group in the total pattern of economic activity in Canada can be expected to change substantially. The final section of this chapter discusses these changes in "economic structure".

### STRUCTURAL SHIFTS

It is still possible nowadays to pick up a book portraying Canada to foreigners—including some books written by Canadians—and get the impression, from scanning the subject headings and illustrations, that this is a country dominated by such industries as agriculture, mining, forestry, hydro-electric power, and fishing. To suggest otherwise is not to deny their continued importance. But in terms of economic structure, their combined contribution to total activity in Canada has been declining for many years. This is particularly so for the primary industries group comprising agriculture, forestry, and fishing. Since the end of the Second World War, the group's share of total employment has dropped from 28 per cent to 9 per cent and the share of the overall value of production has fallen from 15 per cent to around 5 per cent.

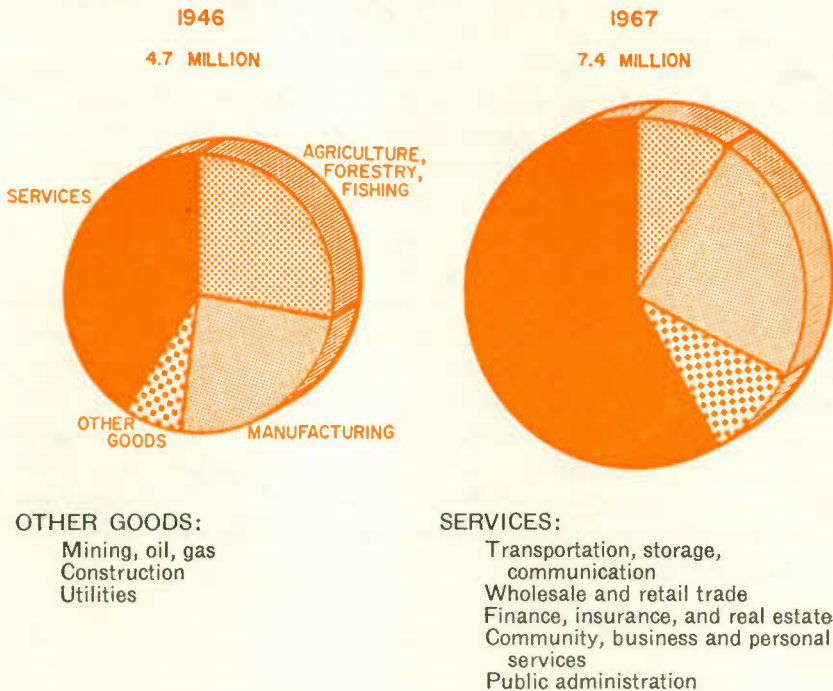
This is only one of several important structural changes that have occurred in Canada as a result of shifting world and domestic demand patterns, and the influence of far-reaching and accelerated technological change. These forces and others have helped to transform Canada into an advanced industrial, highly urbanized and substantially service-oriented nation. The increases in living standards which have accompanied these changes have been considerable, and have themselves helped to shape the new structure of the economy. Rising living standards in all modern societies are associated with rising consumer demands not only for new products, but also for such services as better health care, more education, more travel, and more recreation.

## *Growth, Efficiency and Structure*

As a consequence of these many developments, the largest part of Canada's labour force now is engaged in the production of services (Chart 2-4). Since the end of the Second World War, these service industries have increased their share of total Canadian employment from about 40 per cent to almost 60 per cent. Their proportion of the total value of output, which was approximately 50 per cent in 1946, now is also approaching 60 per cent. Appendix Table A-2 provides details on industry shares of output, employment and capital stock.

Outside the primary goods area, the other goods-producing industries have had a different experience in terms of their relative place in the overall economy. Their position has not, in fact, changed at all over the two decades; then as now, they accounted for about one-third of total employment and approximately two-fifths of the total value of production.

CHART 2-4  
DISTRIBUTION AND GROWTH OF EMPLOYMENT



Source: Based on data from Dominion Bureau of Statistics.

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### CONCLUDING COMMENTS

On the basis of the discussion in this chapter, it is apparent that *change* is the essence of growth in virtually all parts of the economy. Thus in a broad sense, policy should be aimed at removing obstacles to change and at facilitating flexible adjustments that would permit limited resources to be used more efficiently. In too many cases in the past, undesirable rigidities or distortions in the structure of the Canadian economy have resulted from tariff policies, subventions and subsidies, certain regional and transportation policies, lack of effective manpower-mobility programs, and lack of competition.

The role of competition can, in many situations, be crucial to this whole process of appropriate change. This has been a major theme in various parts of the Council's work, especially in the analysis of scale and specialization in Canadian manufacturing and of competition policies. Most of the service industries are not exposed to international competition, and many of them are also not significantly exposed to domestic competition. In these circumstances, more attention needs to be devoted to other possible means of encouraging increased productivity. This is the major theme in the chapters on health care and higher education.

The analysis in this chapter focuses attention on the principal elements of growth in major groups of industries. By itself, this does not provide an adequate basis for policy conclusions about the appropriate allocation of expanding productive resources among industries. To provide such a basis, a much wider range of considerations must be taken into account—including demand changes as affected by growth of incomes, changes in individual tastes and collective wants, alterations in the structure of prices and costs, and international developments. In addition to demand forces, such important matters as entrepreneurial skills, management capabilities, technological change, institutional conditions (for example, well-functioning financial markets), and attitudes and motivations, all have profound implications for the dimensions and patterns of economic growth and change. A better understanding of these complex issues is needed, and in our future work we will be seeking to make a continuing contribution to this end.



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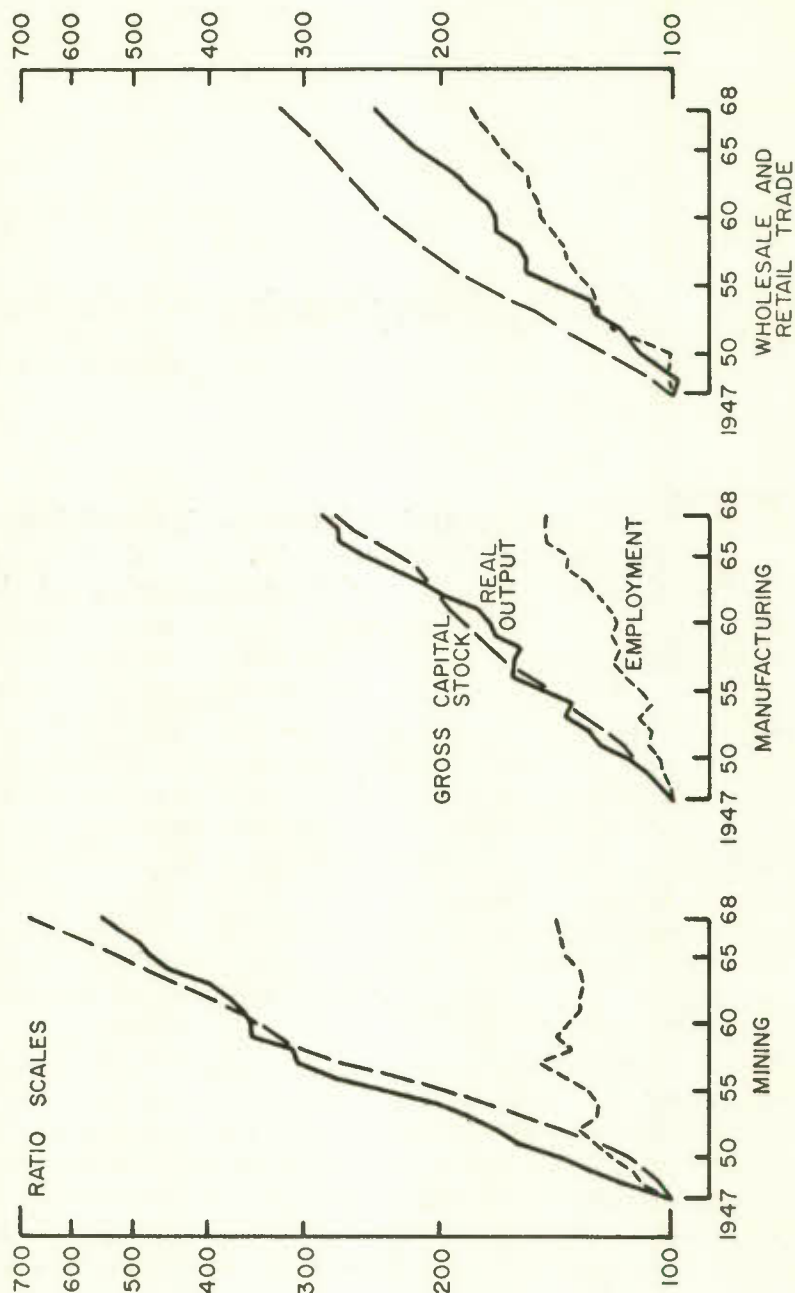
## *Mining, Manufacturing, Wholesale and Retail Trade*

**T**HIS CHAPTER examines, in more detail, some of the growth patterns both among and within three of the principal sectors of the economy—mining, manufacturing, and wholesale and retail trade. They were selected because they represent various types of commercial activities and are illustrative of the enormous variety of factors that enter into the growth of different industries. For example, the mining industries are highly export-oriented, and have grown rapidly—although with differently timed surges of expansion. In the case of wholesale and retail trade, there have been vast changes over the last quarter century, many of which were associated with the increased role of supermarkets, shopping centres, and self-service; and the rapidly spreading ownership of automobiles. Manufacturing has undergone major technological developments in its methods of production, and there has been a great proliferation in the types of products produced, with increasing exports particularly in the 1960's.

Some features of the marked differences in growth patterns existing among these three sectors have already been indicated (see Chart 2-2 in the preceding chapter). In mining, *capital* has been a dominating factor contributing to output increases. In contrast, in wholesale and retail trade, *labour* is the main factor contributing to growth. In these two groups of industries, capital and labour made even more important contributions to growth than rising *factor productivity*—that is, the increasingly efficient use of productive resources. Manufacturing industries, as a whole, experienced a

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CHART 3-1  
REAL OUTPUT, EMPLOYMENT, AND CAPITAL IN MINING, MANUFACTURING,  
WHOLESALE AND RETAIL TRADE  
(1947 = 100)



Note: Real output and capital stock indexes are based on 1961 constant dollar figures.  
Source: Based on data from Dominion Bureau of Statistics and estimates by Economic Council of Canada.

## *Mining, Manufacturing, Trade*

pattern of growth reflecting more evenly balanced contributions from the three sources—labour, capital, and factor productivity. Among particular manufacturing industries, however, there was a wide diversity in the relative importance of these three basic elements of growth. Chart 3-1 shows, for each of the three sectors, the increases that have taken place over the postwar period in real output, employment, and gross capital stock.<sup>1</sup>

### MINING

The output of the mineral industries<sup>2</sup> increased over the two postwar decades at an annual average rate of about 8.5 per cent, compared with slightly over 4.5 per cent for the whole economy.

A major reason for this rapid growth of Canada's mining industries is that most other industrialized countries of the western world—the United Kingdom, other large western European countries, the United States and Japan—have all been experiencing declines or relatively slow rates of growth in mining, and have been increasingly turning to other less densely populated, resource-rich countries for their mineral product requirements. Since the output of Canada's mineral industries has been growing rapidly, with employment increasing at less than 2 per cent a year, output per employed person has risen at the remarkably high rate of more than 6 per cent a year over these 20 years. Furthermore, the increases in employment include workers associated with exploration and other services incidental to mining. In the past, widespread attention has been focused on this rapid growth of *labour productivity*. But this can be misleading since these industries have for some time been very capital-intensive and have become much more so during the postwar period. Also, their manpower has become more and more skilled. For these reasons, it is important to relate output increases more adequately to the increase in all resources used.

The postwar increases in combined capital and labour inputs in the mining industries, along with the trend of rising output, are

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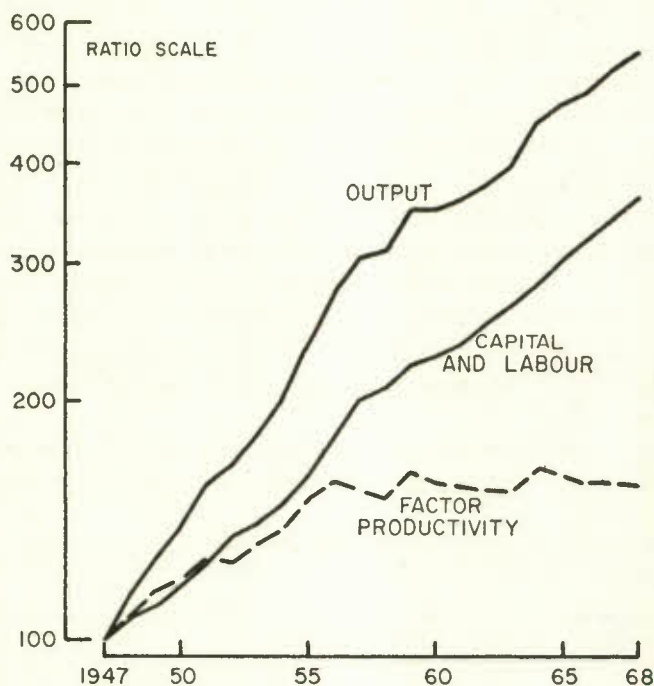
<sup>1</sup>The variations among industries in the relative contributions of particular inputs to increases in output stem from both the levels and the rates of increase in the productive resources used.

<sup>2</sup>The mineral industries include metal mines (which in 1961 accounted for 57 per cent of the total output of this sector), mineral fuels (24 per cent), nonmetal mines (9 per cent), quarries and sandpits (3 per cent), and services incidental to mining (7 per cent). They do not include refining or transportation of products to consuming areas, whether by pipelines or other carriers. For a more detailed examination of changes in particular groups of mining industries, see John Dawson, *Productivity Change in Canadian Mining Industries*, Economic Council of Canada Staff Study No. 30, Ottawa, Queen's Printer, forthcoming.

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shown in Chart 3-2. Also shown are the increases in *factor productivity*—that is, the amount by which increases in output exceeded the combined rates of increase in labour and capital inputs. During the first postwar decade, the rates of growth of output, employment, capital stock, and factor productivity were all relatively high. In particular, the rate of increase in factor productivity was high in comparison with that in other Canadian industries and with mining in many other countries. The following decade, however, was a period of less-sustained growth in the total output of the mining industries. Also, there was no increase in employment in mining during this decade as a whole, and very little increase in factor productivity. But the capital stock continued to increase at close to the rate recorded in the previous decade.

CHART 3-2  
REAL OUTPUT, COMBINED CAPITAL AND LABOUR  
INPUTS, AND FACTOR PRODUCTIVITY IN MINING  
(1947=100)

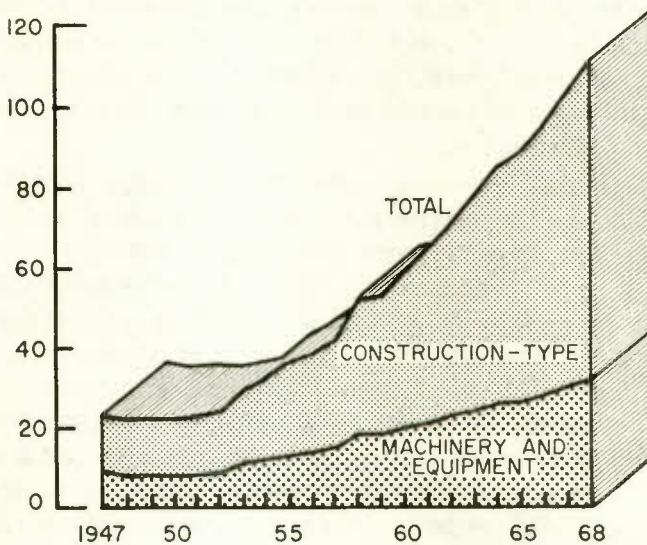


Source: Based on data from Dominion Bureau of Statistics and estimates by Economic Council of Canada.

## *Mining, Manufacturing, Trade*

Because of the large and growing importance of capital in mining—capital rose from 50 per cent of the value of total inputs in 1949 to 65 per cent in 1961—the role of capital warrants considerable attention. Increases have come about through a general substitution of capital for labour in mineral production, as well as a lengthening of the period required to bring new mines or reserves of oil and gas into production. The gross capital stock, which measures the cumulated investment in exploration, development and extraction of minerals, includes both machinery and equipment and construction-type capital, but not the mineral resources themselves.

CHART 3-3  
GROSS CAPITAL STOCK PER EMPLOYED PERSON  
IN MINING  
(Thousands of 1967 dollars)



Note: Since the estimates of employment used here approximate equivalent full-time employment and are lower than other estimates, the capital stock per employed person estimated here is slightly higher than that in Chapter 2.

Source: Based on data from Dominion Bureau of Statistics.

Increases in the amount of capital per person employed in mining are striking (Chart 3-3). Gross capital stock per employee in mining in 1967 dollars increased from less than \$25,000 in the early postwar years to more than \$100,000 in recent years. The investment in mining has been very largely construction-type capital, including both



## *Patterns of Growth*

engineering and building. Engineering construction accounts for over three-quarters of the total construction-type capital, and includes investment by the mining industry in oil drilling and mine development, as well as on roads, bridges, etc., built specifically for the mining operations. The stock of machinery and equipment, even though it has tripled in relation to the number of persons employed in the industry, accounts for a lower proportion of the total stock of capital than it did two decades ago. This proportion declined from 40 per cent in 1947 to less than 30 per cent in 1967. Even so, mining activities have become much more highly mechanized.

In addition to these rapid increases of capital within the mining sector, there have been other heavy investments of capital that have been closely associated with mining developments. For example, the above figures do not include investment in railways such as the Pine Point and Quebec North Shore, nor investment in major oil and gas pipelines. Nor do they include much of the substantial investment in roads, schools, hospitals, and other social capital in locations such as Thompson, Schefferville, and others, in which whole new towns have been built up in direct association with the development of large new mining projects.

The large and increasing proportion of capital investment in engineering-type construction stems from the kinds of activity that mining entails; from the increasing scale of construction activity required to bring lower-quality or deeper ore bodies into production; and from the increased expenditures required to carry out development work for mines, and oil and gas fields, in remote areas.

The average scale of operations has been increasing also. For example, in metal mining the total output now is more than five times as great as in the early postwar years, but the total number of mines is no larger.<sup>1</sup> Bringing increasingly remote, lower-grade, or more deeply buried ore bodies into production can only be economically accomplished through mines of larger scale and longer productive lives. This, in turn, entails substantial investments in pre-production mine development. The scale of most mining ventures is such that it is not feasible to bring them "on stream" to coincide in any precise way with world expansion in demand for mineral products. The mines are generally being brought into production for periods

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<sup>1</sup>Metal mining, which frequently entails joint production of several mineral products from a single mining operation, includes the production of the following products (ranked in terms of their value in 1969): copper, nickel, iron ore, zinc, lead, gold, silver, molybdenum and uranium.

## *Mining, Manufacturing, Trade*

running upwards from 15-20 years, and it frequently takes as long as five years before actual production starts at a new mining project.

With the increased average scale of mining operations, and with the substantial capital investments that have been made, profitable operations have required increasingly highly qualified and skilled manpower as a crucially important element in the growth and development of most of the mineral industries. Frequently, mineral enterprises must pay substantial premiums to attract highly skilled workers to the relatively remote areas where mining activities are located. Average weekly wages and salaries in the mining industries in recent years have been about 25 per cent higher than the average of all other industries. Even then, employment shortages frequently arise, particularly in periods when the economy is operating close to its potential. To make it possible to recruit and maintain an adequate work force, mine companies frequently make substantial investments in housing and in a wide range of community and social services.

While the mining industries as a group have exhibited a rapid rate of growth of output and build-up of capital stock, they are in fact a very heterogeneous group, with different and changing characteristics of production, and differently timed surges of investment and production. Intense development activity is typically followed by a rapid build-up in production, as, for example, in uranium, iron ore, petroleum and natural gas, lead and zinc, potash, and coal. Furthermore, there is a lumpiness to the process of capital investment, and frequently substantial overcapacity has been built up, which on occasion has persisted for long periods.

Despite differences between the individual mining industries, their factor productivity as a whole increased rapidly in the first postwar decade, but rose very little in the period 1957-67 (as shown in Chart 3-2). Relatively low rates of productivity growth in this latter period are apparent for the two largest groups—metals, and petroleum and natural gas—which together account for about four-fifths of total mining output. The nonmetallic minerals group, in which asbestos was the dominant product until the recent development of the potash industry, showed gains in factor productivity until 1965. Since then, however, the heavy capital investments associated with potash mining without commensurate increases in output have resulted in declines in factor productivity.

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### MANUFACTURING

In contrast with mining, there has been much greater diversity among the manufacturing industries in the way that growth has been achieved. Although output has increased over the postwar period in all of the principal manufacturing industries, the rates of growth have varied considerably from industry to industry, and also between the first and second decades of the period. Moreover, there have been wide differences in the relative contributions of labour, capital, and factor productivity to the growth of output.

The different growth rates within manufacturing are reflected in the changing shares of shipments of products. In brief, the share of total shipments accounted for by the more rapidly growing manufacturing industries increased from about 40 to 50 per cent. This faster-growing group was composed of the transportation equipment, electrical products, machinery and metal, chemical, petroleum, and nonmetallic mineral product industries. The more slowly growing industries included the food and beverage, tobacco, textile, clothing, rubber, leather, printing, and wood and paper products industries. These industries are, of course, themselves aggregates of many diverse parts. For example, the "transportation equipment" industry includes output of automobiles, trucks, buses, aircraft, railroad locomotives and rolling stock, ships and ship repairs, as well as a bewildering array of parts and components for these products. Similarly the "electrical products" industry turns out products ranging from electric kettles to sophisticated equipment for aerial navigation or space travel; from miniaturized circuits assembled under a magnifying glass to massive turbines that do not fit comfortably on a railroad flatcar; from three-foot household extension cords to heavy, transoceanic submarine cables. Frequently, even industries in which some segments are declining have other segments in which performance has been impressive. Within the textile industry, for example, substantial innovations have taken place to meet the growing popularity of synthetic fibres, style changes and the growing household and industrial requirements for textile products. As a result, parts of the industry grew rapidly, particularly in the 1960's, though still not without severe problems of adjustment.

For manufacturing as a whole, the volume of output increased between 1947 and 1967 at a rate of about 5 per cent a year, only slightly above the growth rate for the economy as a whole. Capital



## *Mining, Manufacturing, Trade*

stock increased at about the same rate, while employment increased at a rate of about 2 per cent a year. Taken together, increased labour and capital inputs accounted for about three-fifths of the growth in output, and improved factor productivity for about two-fifths.<sup>1</sup>

None of the major manufacturing industries experienced an absolute decline in real output over the postwar period. Annual rates of growth, however, varied considerably—from less than 3 per cent for clothing, rubber and leather products, to 8 per cent or more for petroleum products, electrical products and the miscellaneous group of manufacturing products (which includes, among other things, scientific and precision equipment, and recreational products). Chemicals and nonmetallic mineral products also experienced rates of growth of output well in excess of the manufacturing average. For the period 1957-67, machinery manufacture, and textiles (not including clothing) and knit goods, also displayed strong growth performances. The remainder of the manufacturing industries, over the years 1947-67, clustered nearer to the average of 5 per cent a year—though even for these, the growth in real output varied from less than 4 per cent a year to nearly 5.5 per cent, a significant difference over a 20-year period.

In general, the rates of increase in employment tended to be relatively high in the rapid-growth industries. The rate of growth of capital, however, varied widely, although there were increases in capital stock per employed person in all industry groups (Chart 3-4). Large differences in the degree of capital-intensity among the manufacturing industries became more pronounced over the past 20 years. In 1967, gross capital stock per employed person ranged from about \$4,000 in the clothing and leather products industries to \$40,000-\$50,000 in the chemical and pulp and paper industries, and much higher in an industry like petroleum and coal products.

Looking at these developments broadly, some industries achieved their growth in output by relatively balanced additions of labour and capital, others by increasing capital in a much more predominant manner. In the electrical products industry, for example, output increased at about 8 per cent a year, reflecting large and

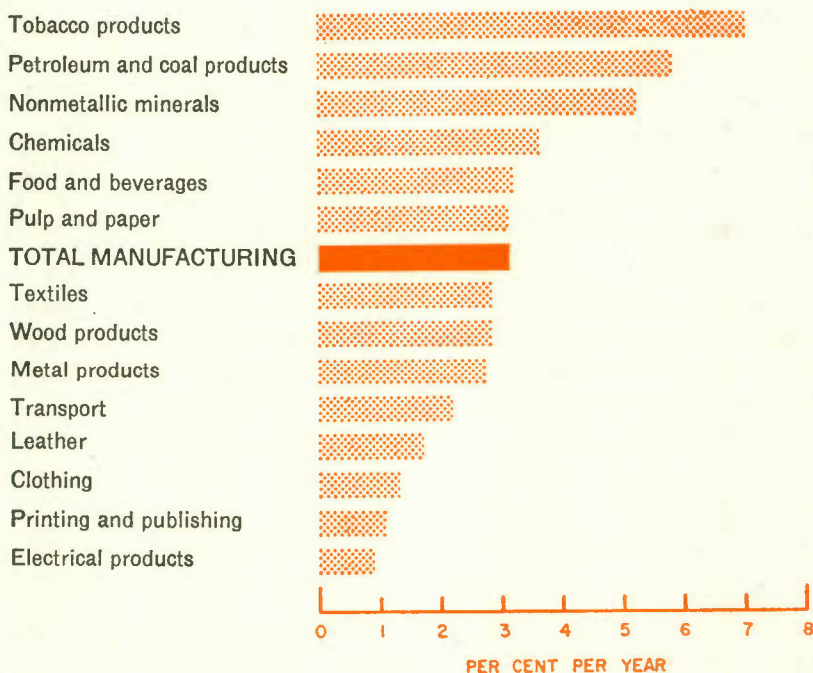
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<sup>1</sup> There are some differences between these estimates for the manufacturing sector as a whole, which are based on data underlying Chapter 2, and the estimates set forth below for individual manufacturing industries. The former, for example, make certain quality adjustments in the labour input to take account of changes in age and sex, as well as in the formal educational attainments among those employed, while in the latter estimates it has not been possible to make such adjustments because of lack of relevant information for particular manufacturing industries.

## Patterns of Growth

relatively balanced increases in labour and capital inputs and an increase in productivity that was well above average. The chemical and the petroleum products industries, which achieved rates of growth in output of about the same magnitude as the electrical products industry, did so by combining more moderate increases in employment with substantially larger additions to capital. Some industries, by careful economy in the use of labour and capital, have achieved significant gains in productivity even with a moderate growth in output. The leather industry is an example of this pattern: its rate of growth in output, which was the lowest among the major manufacturing industries, was achieved by only a small addition to capital; an actual decline in employment; and a gain in factor productivity of about 2 per cent a year.

CHART 3-4  
GROWTH OF CAPITAL STOCK PER  
EMPLOYED PERSON, 1947-67



Note: Based on gross capital stock per employed person in constant 1961 dollars.

Source: Based on data from Dominion Bureau of Statistics and estimates by Economic Council of Canada.

## *Mining, Manufacturing, Trade*

A more detailed analysis of growth in Canadian manufacturing has been undertaken by the Council's staff, with special attention to differences in growth performance between the first postwar decade and the past decade. A summary of some of the key results of this analysis is contained in Appendix Tables A-3 and A-4.<sup>1</sup>

In spite of the great diversity in patterns of growth among manufacturing industries, a number of significant conclusions emerge:

First, the net effect of shifts in labour and capital *between* the industries shown in Appendix Tables A-3 and A-4 accounted for a negligible proportion of factor productivity growth for manufacturing as a whole. Therefore the changes giving rise to growth of factor productivity have occurred *within* these industries over the two postwar decades. At a finer level of disaggregation, however, productivity gains might very well be associated with resource shifts, possibly reflecting the impact of industries producing new products and requiring new types of labour skills and capital equipment.

Second, rapid growth in output and rapid productivity growth appear to be generally closely associated. Frequently, this reflects substantial increases in investment combined with the rapid introduction of technological change and improved methods of production; greater opportunities for more specialization of output through longer production runs, as well as greater specialization of labour and capital inputs; and perhaps fuller utilization of productive capacity. These changes, which are facilitated when output is growing rapidly, are, in turn, often associated with aggressive management and the use of better-trained and more highly skilled employees.

Third, high rates of increase in output per employed person and in capital-intensity are generally closely associated. Almost all manufacturing industries became increasingly capital-intensive over the past two decades, although there were considerable variations among industries.

### *Canada-United States Comparisons*

Previous Council studies have drawn special attention to the lower level of per capita real income in Canada than in the United States, and have explored some of the factors that contribute to the differences in productivity performance underlying this disparity in

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<sup>1</sup>For a more detailed presentation of the analysis, see Harry H. Postner, *An Analysis of Canadian Manufacturing Productivity: Some Preliminary Results*, Economic Council of Canada Staff Study No. 31, Ottawa, Queen's Printer, forthcoming.



## *Patterns of Growth*

average real living standards.<sup>1</sup> Recent analysis undertaken by the Council suggests that in the 1960's the disparity in output per employed person may have been about 10 per cent.<sup>2</sup> The difference in manufacturing is significantly greater—perhaps of the order of one-third less than that of the United States. In addition, in manufacturing, as for the economy in general, there is also a relatively high ratio of capital to output in Canada compared with the United States.<sup>3</sup> Recent analysis of selected manufacturing industries confirms this. In the manufacturing industries examined, the gap in output in relation to both labour and capital inputs appears to be of the same order of magnitude regarding output per employed person as that referred to above. This is a highly important matter for it suggests that, for various underlying reasons, both labour and capital are perhaps being generally used less effectively in Canadian manufacturing than in comparable U.S. industries.

Within these broad generalizations, however, there are significant variations in the Canada-U.S. comparisons of particular industries. Illustrations of some of these differences are provided in Appendix Table A-5. Substantial disparities exist, of course, in the volume of gross output of particular industries in the two countries. For example, for wool yarn mills and iron and steel, Canadian output is only about 5 per cent of that in the United States, while for pulp and paper and sawmills, Canadian output is about a quarter of that in the United States.

In a few manufacturing industries, productivity—measured either as output per employed person or as output in relation to both labour and capital inputs—is relatively high in Canada (for example, sawmills, iron and steel, pulp and paper, and dairy products). But for many of the various industries examined, productivity in Canada was substantially lower than in the United States.

There are considerable variations in the relationships between output and capital and labour inputs in the two countries. For example, in the rubber and petroleum refining industries, the ratio

<sup>1</sup>See, for example, Economic Council of Canada, *Fourth Annual Review*, Ottawa, Queen's Printer, 1967, Chapter 6; D. J. Daly, B. A. Keys and E. J. Spence, *Scale and Specialization in Canadian Manufacturing*, Economic Council of Canada Staff Study No. 21, Ottawa, Queen's Printer, 1968; Economic Council of Canada, *Fifth Annual Review*, Ottawa, Queen's Printer, 1968, Chapter 2; and Dorothy Walters, *Canadian Income Levels and Growth: An International Perspective*, Economic Council of Canada Staff Study No. 23, Ottawa, Queen's Printer, 1968, (especially Chapter XVI).

<sup>2</sup>See Dorothy Walters, *Canadian Growth Revisited, 1950-1967*, Economic Council of Canada Staff Study No. 28, Ottawa, Queen's Printer, 1970, which updates Canadian data and carries forward analysis of these data to 1967.

<sup>3</sup>See E. C. West, *Canada-United States Price and Productivity Differences in Manufacturing Industries, 1963*, Economic Council of Canada Staff Study No. 32, Ottawa, Queen's Printer, forthcoming.

## *Mining, Manufacturing, Trade*

of labour to output is not much higher in Canada, but the ratio of capital to output is very substantially larger. In contrast, in iron and steel, the ratio of capital to output is more in line with that in the United States, while the ratio of labour to output is somewhat higher.

In our earlier work, we have placed emphasis on specialization in manufacturing as being one—*but only one*—of the significant factors involved in productivity differences between Canadian and U.S. manufacturing. More recent analysis of a number of comparable Canadian and U.S. manufacturing industries tends to confirm our earlier conclusions. In particular, differences in productivity performance between such industries appear to be related not so much to differences in the *size* of establishments as to the *specialization* of production within establishments. An important implication is that, for many products, establishments do not need to be large to be efficient. Also, it should be emphasized that specialization *per se* does not guarantee high productivity—market, technological, management and many other considerations may be critically important.

Prices of manufactured products appear, on average, to be higher in Canada than in the United States. For a comparable range of industries, the average prices of material inputs and fuels are apparently little, if any, higher in Canada than in the United States, but prices of products leaving the establishments are frequently of the order of 5 to 10 per cent or more higher in Canada. These disparities in price levels undoubtedly reflect many factors. But it is significant that, in general, the better the productivity performance in Canadian industries in relation to that in comparable U.S. industries, the lower prices appear to be, in relation to those in the United States.

For many products, there would appear to be a "virtuous circle" in which *larger-scale markets* facilitate increased *specialization* in production which, in turn, promotes relatively *high levels of productivity*; and the latter, in turn, tend to permit relatively *lower prices* in comparison with the United States, thus laying the basis for *more competitive and sturdier growth*.

## WHOLESALE AND RETAIL TRADE

In this section we shift emphasis from the production of goods to their distribution. Distribution is an integral part of the economic process—getting goods where they are wanted, when they are wanted, and in the quantities, qualities and condition wanted. Distribution encompasses a variety of services performed by different "industries"—transportation, communications, finance, wholesale and retail

## *Patterns of Growth*

trade and, to some extent, even within manufacturing. In this section, attention is focused on the wholesale and retail trade "industry". This industry accounts for one out of every six workers in the economy and for almost one-quarter of the output of all service-producing industries in the economy.

Wholesale trade, which accounts for close to 9 per cent of the output of the service-producing industries, and close to 5 per cent of total output in the economy, covers a wide range of activities. Many of the establishments are primarily involved in buying merchandise such as machinery, equipment and supplies for resale to commercial, industrial, institutional or professional users. The rest of the establishments in wholesaling are engaged in buying and reselling to retailers the wide variety of products eventually purchased by consumers.

Retail trade accounts for 14 per cent of the output of the service-producing industries, and close to 8 per cent of total output in the economy. About two-thirds of such trade is carried on in a wide variety of types of shops and stores. A significant part of the remainder is associated with the sales and servicing of automobiles.

In an examination of the growth of wholesale and retail trade, one is made aware of a number of important developments, all of which stem from the complexity and rapidity of change in a modern, increasingly urbanized industrial society.<sup>1</sup> They include:

- (1) an increasingly sophisticated system of distribution in which mass merchandising, advertising, extensive credit arrangements, as well as innovations in the use of computer and communications technology, play important roles;
- (2) integration of wholesale and retail operations under a common ownership, with goods moving faster and more efficiently via more direct routes to the market place than formerly; and
- (3) the shifting of many functions of distribution (for example, packaging, storage and transportation) either back to the manufacturer, or forward to the consumer.

These "production" changes, coupled with shifts in demand patterns, have influenced in various ways the growth of the many different activities that fall within wholesale and retail trade, with the result that many of them have exhibited average annual rates of growth of real output over the postwar period very different from the 4.6 per cent per year for the whole sector (Chart 3-5).

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<sup>1</sup>For a general treatment of changes in distribution, see M. S. Moyer and G. Snyder, *Trends in Canadian Marketing*, DBS Census Monograph, Ottawa, Queen's Printer, 1967.

## *Mining, Manufacturing, Trade*

CHART 3-5

### GROWTH OF REAL OUTPUT, WHOLESALE AND RETAIL TRADE, 1947-67

#### SELECTED WHOLESALE TRADES



#### ALL WHOLESALE TRADE



#### SELECTED RETAIL TRADES



#### ALL RETAIL TRADE



#### TOTAL TRADE



PER CENT PER YEAR

Source: Based on data from Dominion Bureau of Statistics.

Within retail trade, for example, while independent grocery stores showed relatively slow growth over the postwar period, chain grocery stores underwent a more rapid expansion. This rapid growth reflected, in part, the gains resulting from the adaptability of their chain structure to urbanization and, in part, the expanding sales of nonfood items which traditionally had been sold in general and



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variety stores. Faced with this strong competition from the chains and with slow population growth (or even decline) in nonurban markets, the general stores showed slow growth in output. In contrast, variety stores grew aggressively during the 1957-67 period when they assumed some of the characteristics of small department stores and sought new locations in fast-growing suburban areas. Also, over the past two decades, very rapid growth has taken place in the activities of motor vehicle dealers and of service stations and garages.

Due to a number of considerations—including the shift of some of the functions of distribution to manufacturers or consumers—it is extremely difficult, in any precise way, to measure and relate changes in output to changes in resources used. For wholesale and retail trade as a whole, however, there appears to have been relatively slow growth in factor productivity (Chart 2-2). Over the 1947-67 period, employment increased faster than in manufacturing or in the total economy, with an average annual rate of growth of 3 per cent. The trades accounted for almost 17 per cent of total employment in the economy in 1967, compared with only about 13 per cent two decades earlier. Labour input has, in fact, been the factor contributing most to output growth in the distributive trades. In 1967, about one out of every three workers was female—a slightly higher proportion than in 1947.

Employees work more hours per week in distribution than in manufacturing, but average hours worked were reduced substantially over the postwar period in both sectors. The net effect of increases in employment and decreases in hours worked per week was a growth in hours of labour input of 2.5 per cent in trade in comparison with 1.6 per cent in manufacturing.

There were also other changes in the use of labour in the trade sector which have implications for productivity. In contrast with manufacturing and the economy as a whole, the average age of males employed in the trades was lower in 1967 than in 1947. There was a large increase over the postwar period in employment of males under 20 years of age. Consistent with a general trend in the economy, the average age of females employed in the trades was higher in 1967 than in 1947. There was a large increase over the period in employment of females in the over-35 age group (apparently joining or rejoining the labour force after raising a family). On balance, the labour force in the distributive trades in 1967 may have had a larger proportion of less experienced employees than in 1947, and this could have had a retarding effect on productivity growth. In



## *Mining, Manufacturing, Trade*

addition, the education levels of both males and females employed in the trades rose less rapidly over the 1947-67 period than those in manufacturing and in the economy as a whole.

Finally, while the growth of capital appears to have been relatively rapid, with a rate of increase of almost 6 per cent per year over the 1947-67 period, the amount of capital stock invested per person employed (especially in machinery and equipment) is relatively low compared with most other sectors of the economy. Appraisal of the role of capital in the trade sector is complicated, however, by the widespread use of "lease-back" arrangements on buildings and the significance of inventories.

The net result of the changes in trade was that the rate of growth of output exceeded the rate of growth of combined labour and capital inputs by about 1 per cent per year over the postwar period, about half the rate of factor productivity increase in manufacturing. This disparity in productivity performance is affected by a wide variety of influences. Among the most significant ones are a lower rate of increase in skills and experience of the work force in trade than in most other industries; fewer opportunities to apply labour-saving technology; and fewer opportunities to achieve economies through larger scale and specialization. Also, another contributing factor may be the partial shift of certain distributive services which may be amenable to high-productivity operations back to the factory—such as packaging and labeling.

Because data are not available on capital inputs by categories of retail and wholesale trade, it is not possible to indicate factor productivity performance for individual industries within this sector of the economy. But in terms of output *per person employed* over the postwar period, productivity in the distributive trades increased by 1.5 per cent per year compared with 2.6 per cent for the economy as a whole. Output *per man-hour* in trade increased by 1.9 per cent per year. For the 1957-67 decade, it is possible to examine trends in output per employed person in the trades in more detail (Table 3-1). Output per person employed in wholesale trade increased at 2.7 per cent a year, compared with only about 1 per cent a year for retail trade. This may be due in part to improvements in the wholesale operations of vertically integrated retail firms.

Within retail trade, there was considerable diversity. Output per person employed in food retailing appears to have declined over the 1957-67 period, but this fails to tell the whole story. Partly due to the rapid growth of part-time employment, the growth in output per

## *Patterns of Growth*

man-hour has probably been positive. In general, increases in output per employed person have been higher among trades that experienced faster growth in output.

TABLE 3-1—GROWTH OF REAL OUTPUT, EMPLOYMENT AND  
OUTPUT PER EMPLOYED PERSON, WHOLESALE AND  
RETAIL TRADE, 1957-67

	Real Output	Employment	Output per Employed Person
	(Per cent per year)		
Total trade.....	4.3	2.8	1.5
Wholesale trade.....	4.5	1.8	2.7
Retail trade.....	4.2	3.3	0.9
Food stores.....	4.1	4.5	-0.4
Department stores.....	4.2	3.5	0.7
Variety stores.....	7.3	2.5	4.8

SOURCE: Based on data from Dominion Bureau of Statistics and estimates by Economic Council of Canada.

## CONCLUDING OBSERVATIONS

Our examination of growth and productivity change in these three sectors illustrates the variety of ways in which changes in individual industries contribute to the overall growth of the Canadian economy. The preceding highlights of some of the principal elements in past developments are intended to provide illuminating perspective as a background to future growth and change to which we will be returning in later Reviews.

Since the analysis has not yet been linked with an assessment of demand for the output of industries in these sectors, it is not yet possible to consider the growth potential of the individual industries or sectors. Nevertheless, the broad patterns of change in the context of a relatively high growth potential for the Canadian economy in the 1970's are reasonably clear.

Expansion of the mineral industries in the 1970's at a substantial rate will continue to depend heavily on the investment of large amounts of capital. At the same time, we recognize that a wide variety of other important factors are also likely to shape the future

## *Mining, Manufacturing, Trade*

growth, not only of this sector of the economy as a whole, but also of its various different components, and that different sets of factors may affect various parts of the mineral industries in quite different ways—for example, oil and gas versus the metal mining activities. The relatively high level of exploration and development during the latter half of the 1960's brought a number of large mining developments into the planning stages. Although we have not undertaken any detailed examination of the implications of proposed changes in taxation and other policies, such changes could significantly affect the rate of growth of the mineral industries. Employment in mining, while involving increasingly skilled manpower, is not likely to increase markedly. While employment may increase in some mineral industries, such increases will likely be largely offset by further declines in employment in gold mining and in Nova Scotia coal mining. These two industries still accounted for 20 per cent of total mining employment in 1967.

In manufacturing, rates of increase in output and aggregate market size are intimately related to productivity performance. In this context, the importance of large and rapidly expanding markets is apparently not so much that they facilitate creation of larger establishments, but rather that they permit greater specialization of production within establishments—patterns of specialization making possible more effective utilization of both labour and capital.

The rate of expansion of Canadian manufacturing industries in the 1970's will depend on a number of considerations in addition to those examined in this chapter. On the demand side, trade and relative price considerations are important. In the 1960's, a variety of factors contributed to a sustained boom in exports of manufactured goods. Significant elements in the trade successes were: some declines in trade barriers abroad; a high level of foreign demand resulting from buoyant economic conditions, particularly in the important U.S. market; a stronger domestic market base to support competitive exporting; the automotive trade agreement with the United States; the special defence-sharing arrangements with the United States; improved export promotion of manufactured products by the federal government; and considerably more confident, aggressive and knowledgeable export marketing by a wide range of Canadian industries and companies. Perhaps most important of all was the turnaround of 13 per cent in the value of the Canadian dollar from the peak of the late 1950's to the post-devaluation position. This had much the same competitive effect, broadly speaking,

## *Patterns of Growth*

as a decline in prices of that magnitude for many exports, or potential exports, and an increase in price by like amount for imported products. A relative price change of such magnitude would be extremely difficult to achieve in so short a space of time by improvements in productivity. To the extent that the exchange value of the Canadian dollar remains above that of the latter part of the 1960's, there would obviously be some of the opposite effects in the 1970's. In other words, productivity improvements would need to become a relatively more important factor in the maintenance of a strong international competitive position, especially for many Canadian manufacturing industries.

In wholesale and retail trade, the expected rapid growth of the labour force will be significant for activities where the growth continues to be based substantially on increased labour inputs. The potential for improvements in productivity in the distributive trades, however, rests on their capacity to make organizational innovations. The evidence lies in the changes that we have seen during the post-war period in retailing, involving, for example, the department store, supermarket, and the increased role of suburban shopping centres. Exciting frontiers in productivity growth in trade will perhaps be found mainly in the challenges offered by advances in information and communication technology. In this context, both organizational innovation and the development of new distribution methods that will serve consumers well will be matters of central importance.



*Health Care*

**B**OTH HEALTH care and education are vast and complex fields in which great advances have been made towards expanding knowledge and better serving the needs of individuals and of our society. They encompass a wide-ranging variety of problems and questions extending far beyond our competence to assess. Moral and social value judgments are involved which cannot be made on economic grounds alone. But health care and education are both becoming rapidly more important elements in our economic system, and the economic aspects of these activities urgently require more careful appraisal.

In both health care and education, the attention and energy of the people involved in economic decision-making over the past decade and a half have largely been devoted to facilitating the enormous expansion which has taken place in these fields. More recently, however, increasingly persistent and probing questions are being asked about how to use rapidly expanding capital and highly skilled human resources to the best advantage to achieve the goals which Canadian society wishes to set for itself in the health and education fields. Reinforcing this need is the fact that these important sectors of the economy, which constitutionally fall largely within the jurisdiction of the provincial governments, are much less exposed than many other "industries" to market forces and competitive pressures which tend to act as a spur to efficiency.

Also reinforcing this need are the prospects for further very large increases in expenditures on health care and higher education during

## *Patterns of Growth*

the 1970's. Looking ahead to 1975, about \$1 out of every \$6 or \$7 of the increase in the total income in the economy could be taken up by health care and higher education. But such a rate of expansion in expenditures in these fields is simply not sustainable for the long run—if the rate of increase of the past five years were to continue unabated, these two areas of activity alone would absorb the entire potential national product before the year 2000.

Thus the extent to which Canadians can enjoy and accommodate future growth in education and health services is inevitably going to depend increasingly on more effective use of resources in these fields. This is a matter which we believe requires urgent attention in Canada. We are, of course, not alone in this belief. Many Canadians share it. And it is beginning to receive considerable attention in various quarters. We hope that our work may make a constructive contribution to some of the key issues involved. The focus is on health care in this chapter, and on higher education in the following chapter.

### PERSPECTIVE ON SOME ECONOMIC ASPECTS OF HEALTH CARE

Health care has, for some time, constituted one of the largest and fastest-growing activities in the economy. Moreover, the financing of health care has been shifting from the private to the public domain. This is focusing increased public attention on rising health care expenditures. Rapid future increases in health care expenditures are in prospect in the 1970's.

In 1955, total health care expenditures per capita were about \$60. By 1967, these had risen to almost \$170, and by 1975 could double, even on rather conservative assumptions. This implies that about \$1 out of every \$12 of increased income in the Canadian economy from 1967 to 1975 would go to health care. Large and rapidly growing amounts of both capital and manpower (some of it highly educated and skilled manpower requiring further allocation of resources to related educational activities) are being drawn into this sector of the economy. It is therefore becoming increasingly important to raise questions about the effectiveness with which such resources are being, or could be, used. In short, the *economic* aspects of health care urgently need more careful attention.

Concern about the economic aspects of health care has been rising in Canada and is reflected, for example, in the establishment in November 1968 of a Federal-Provincial Committee and Task Forces on the Cost of Health Services and in the recent Report of the Ontario

Committee on the Healing Arts. Similar concern has appeared in the United States and in various other countries. In the past decade, there has, in fact, been an upsurge in many parts of the world in the study of a wide variety of social and economic aspects of health care.

A clear consensus among Canadians has yet to emerge about health care goals. Such a consensus must be based on a wider and better understanding of health care needs, and a more active public dialogue about how these needs can be most effectively met. In this chapter we do not deal with the question of how rapidly expenditures on health care should grow in Canada. Instead, our concern is mainly with the basic issue of how to get more and better health care—how to achieve more effective use of the productive resources devoted to such activities—in relation to whatever level of expenditures is considered to be appropriate. In this context, we interpret the term “more and better health care” to include more equitable distribution of health care among the various regions of the country, between rural and urban populations, and among the poor and various minority groups. In brief, the goal of health care is assumed to be adequate, timely, efficient and humane health care *for all Canadians*.

The health of a nation's people is difficult to define or to measure with any degree of precision. The “output” of the health care “industry” has elusive quantitative, qualitative and price dimensions. One encounters complex issues about how to measure intangible services. We do know, however, that some of the existing economic measures for this sector of the economy are deficient—including the conventional measurement of real output on the basis of measures of labour and capital inputs.

Because health care is an extremely labour-intensive “industry”, and because the major agency supplying health care is the hospital, this chapter emphasizes trends in health care personnel and in hospital use and costs. The focus is on the need for improved productivity.

There are, of course, a great many other economic aspects of health care that merit consideration. In broad economic terms, the maintenance of good health is obviously a matter of great importance. Both the average material standards of living and the resources available to a nation for social and cultural purposes are, in part, determined by the quality of health of its population in general, and of its labour force in particular. Thus health care expenditures not only benefit the individual, but represent an investment that should be expected to yield returns to society as a whole.

Any comprehensive study of the economics of health care would need to recognize that there is far more to maintaining high standards

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of health than simply the provision of access for all Canadians to high-quality medical services. It also requires public education and knowledge about effective use of such services, increased emphasis on preventive measures, including more attention to good nutrition, pollution abatement, recreation, and safety programs to minimize accident hazards.

### GROWTH OF EXPENDITURES

A broad measure of health expenditures is spending on personal health care (see Table 4-1). By 1969 these expenditures had reached about \$4.5 billion, compared with less than \$1 billion in 1955, and it is estimated that they will approach \$8 billion by 1975. This would mean an increase from about \$170 per person in 1967 to around \$345 in 1975. Even this high and rising level is below that in the United States. Per capita health expenditures in that country were about \$240 in 1967, and one projection made in 1967—which, incidentally, already appears to be too conservative—is that they will reach about \$430 in 1975.

A more familiar indicator of rising health care costs is the cost of a hospital patient-day. This cost in a public hospital soared from an average of about \$5 in 1946 to almost \$50 in 1968, and has since gone higher. In the United States, the increase over the same 20-year period has been from \$10 to over \$60 per patient-day.

Government spending on health care in Canada has been growing faster than total expenditures on such care, since a rising proportion of health services is being paid for by governments and a declining share directly by individuals.<sup>1</sup> The introduction of government hospitalization plans was completed early in the 1960's, and the basis for a nation-wide system of medicare was introduced towards the end of the 1960's. Since 1950, expenditures on health care by all levels of government have expanded at a rate of 14 per cent a year, reaching \$3.5 billion by 1969. The rate of growth between 1967 and 1975 was estimated at a rate of over 9 per cent per year in constant dollar terms in our *Sixth Annual Review*—faster than any other major category of government spending.

By 1975, total expenditures on personal health care may amount to about 6.5 per cent of projected Gross National Product, compared with 5.5 per cent in 1969 and approximately 3 per cent in the

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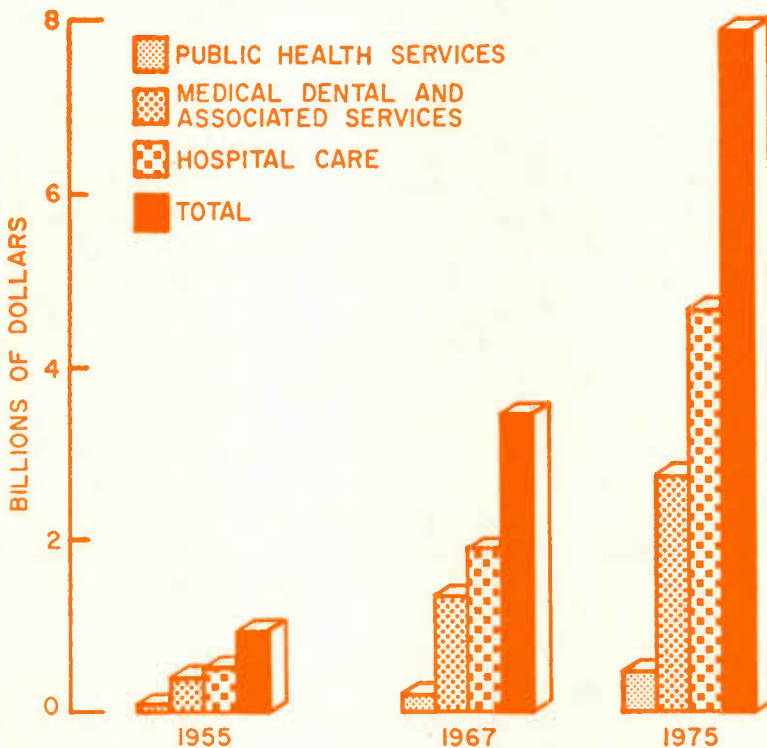
<sup>1</sup>In Chapter 2, health care is included under "community, business and personal services".



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mid-1950's. (Chart 4-1 illustrates the large growth in total health care expenditures from 1955 to 1975; see also Appendix Table A-6.)

CHART 4-1  
HEALTH CARE EXPENDITURES



Source: Based on data from the Department of National Health and Welfare and estimates by Economic Council of Canada.

## PERSONNEL TRENDS

The labour-intensity of health care is indicated by the fact that the earnings of health care personnel account for about 80 per cent of total expenditures on health care and for 70 per cent of hospital operating costs. The size of the labour force in the health care field has been increasing both in relative and absolute terms. The share of the total labour force directly employed in health services increased from slightly more than 2 per cent in 1941 to 4.5 per cent in 1961—from 90,000 to about 280,000 persons. Continued rapid increases in employment in health care have occurred since 1961.

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The numbers of supporting personnel in the health care field include a wide variety of occupations—including technicians, nursing aides, clerks, stenographers, and kitchen and laundry employees. Such personnel increased even more rapidly than the more highly skilled occupations (such as doctors, dentists, and nurses). From 1961 to 1968, the number of health professionals increased by about 40 per cent, and nursing assistants and aides by well over 40 per cent.

In considering the possible future supply and requirements of health care personnel, it is important to recognize that, in some categories, the lead time in training more workers is fairly short (two or three years in the case of a registered nurse; shorter still for some others), so that the supply of such personnel can be adjusted fairly flexibly in response to increased needs. For dentists and physicians, however, long periods of education and training are involved, and flows from the educational system cannot be readily adjusted to meet changing needs and demands.

On the basis of estimates prepared for the Council, there may be a total supply of about 8,500 dentists in 1975, about 30 per cent more than in 1967. This projection is based on the probable output of the dental schools of Canada, an estimated rate of attrition among practising dentists, and an assumption that immigration will continue to be a relatively unimportant factor affecting the supply of dentists in Canada.

The future supply of physicians is more difficult to estimate because of uncertainties about net immigration of such manpower. Over the 1965-68 period, the average number of immigrant physicians was about 1,000 per year. Using estimates of future graduations from Canadian medical schools, a conservative assumption about attrition, and differing assumptions about immigration, the supply of physicians in 1975 may range from 35,000 to 40,000 compared with about 27,000 in 1967.

Many unknowns, including changing notions of what an adequate level and pattern of distribution of health care should be, make it difficult to be precise about future *requirements* for health care personnel. Technological developments and changes in health care systems will also affect the number and kinds of professionals that may be required. The attitudes of the population towards medical care are continually undergoing change, as new therapeutic techniques become available, knowledge spreads, financial barriers are removed, and urbanization proceeds.

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Physicians perhaps, and dentists almost certainly, will be in short supply by 1975. There may be no shortage of *nurses*, but incentives might have to be improved if a shortage of *nursing* is to be avoided. There may be a continuing shortage of therapists and medical social workers. With respect to other health care personnel, there will be a need for continued large increases. But it does not appear beyond the capacity of the educational system to provide them, especially since there will be many more young people in the higher levels of the educational system in the 1970's.

The gross income of the manpower providing personal health care in 1975 is projected at \$6 billion in current dollars, compared with \$2.5 billion in 1967. This increase is based upon four assumptions: a rate of population growth of 1.7 per cent a year; a growth in per capita use of health manpower services of 2.9 per cent a year; a rate of growth in the quality of health services of about 2.5 per cent a year; and a rate of increase in prices of health services of about 4 per cent a year.

### HOSPITAL USE AND COSTS

Hospital expenditures in 1967 accounted for well over half of total health care expenditures (Table 4-1). The importance of hospital

TABLE 4-1—HEALTH CARE EXPENDITURES

	1955	1960	1965	1966	1967
	(Millions of dollars)				
Personal health care <sup>1</sup> .....	881	1,520	2,497	2,820	3,233
Hospital services.....	480	845	1,443	1,651	1,901
Physicians' services.....	206	355	545	605	686
Dentists' services.....	69	110	160	176	187
Prescribed drugs.....	60	101	170	190	240
Other health services <sup>2</sup> .....	66	109	179	198	219
Public health services <sup>3</sup> .....	72	105	138	158	196
Total expenditures <sup>4</sup> .....	953	1,625	2,635	2,978	3,429

<sup>1</sup>The sum of the indented items, whether paid for by government or by private sources. Expenditures on patent medicines, waste removal and sanitation are excluded.

<sup>2</sup>Including services of private duty nurses, nurses employed in other than institutions or doctors' offices, optometrists, opticians, podiatrists, psychologists, osteopaths and chiropractors, and physiotherapists and occupational therapists not employed in hospitals. Dietitians and veterinarians are not included.

<sup>3</sup>Including expenditures on administration, vital and health statistics, TB control, mental health (except hospitalization), public health nursing, laboratory services, alcoholic research foundations, food and drug inspection and control, control of communicable diseases, provision of facilities for training under the Health Resources Fund and Medical Research Council, and, in general, activities rendered on a public basis.

<sup>4</sup>Excluding capital expenditures.

SOURCE: Department of National Health and Welfare and estimates by Economic Council of Canada.

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services has been increasing relative to total health care and to the rest of the economy. The value of the total resources (operating costs plus depreciation) used in the average public hospital is now about eight times the level that prevailed at the end of the Second World War.

Although the number of public hospitals<sup>1</sup> has increased relatively slowly since the Second World War, reaching 1,035 in 1967, bed capacity has doubled, reaching 126,607 in 1967. These changes reflect the net effects of various developments—the expansion of many existing hospitals, the closing of some older and smaller hospitals, and the founding of a number of new and larger ones.

Approximately half of the dramatic increase in average patient-day costs—from about \$5 in 1946 to over \$50 now—is attributable to increases in wages and salaries, partly reflecting a “catching-up” process (see below). While total hospital personnel increased by about 150 per cent over the period from 1955 to 1967, the average number of hours of work per year by a hospital employee declined by about 10 per cent. In 1946 there were 120 personnel of all kinds per 100 beds; by 1967 this had increased to 217. The proportion of part-time personnel has been increasing.

Measured by the number of beds, the size of the average public hospital grew about 30 per cent over the postwar period, reaching 122 beds in 1967. In contrast, the average value of hospital plant assets quadrupled. The raising of capital to finance this expansion has been a major problem for hospital boards. Although in constant dollars the increase in capital represents a somewhat faster rate of increase than that of total employment in hospitals, the capital-intensity of hospitals has not been increasing nearly as rapidly as that of many industries.

Changing patterns in the “output” of hospitals are indicated by the rising proportions of births and deaths taking place in them. Almost all births now take place in hospitals, compared with less than 70 per cent in 1946. Use of hospitals for the care of geriatric patients also has increased rapidly. About two-thirds of all deaths occur in hospitals, compared with less than half in 1946.

Some comparisons of hospital expenditures and utilization between Canada and the United States are shown in Table 4-2. The comparisons should be interpreted with caution, however, because of differences in health care systems in the two countries. Although health care has accounted for a somewhat smaller proportion of

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<sup>1</sup>Including general and allied special hospitals, but excluding federal and private hospitals.



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Gross National Product in Canada than in the United States, the opposite is true for hospital expenditures. Moreover, hospital expenditures increased faster in Canada than in the United States over the 1950-67 period, due partly to a higher rate of growth in population, a faster increase in use per person, and more rapidly rising elements of cost increases. The average length of stay in Canadian hospitals is greater than in the United States.<sup>1</sup>

TABLE 4-2—COMPARISONS OF HEALTH CARE AND HOSPITAL EXPENDITURES AND HOSPITAL UTILIZATION, CANADA AND UNITED STATES

	Canada	United States
	(Percentage)	
Expenditures as Percentage of Gross National Product		
Health care <sup>1</sup>		
1955.....	3.2	3.8
1965.....	4.7	4.8
Hospital		
1955.....	1.8	1.5
1965.....	2.8	2.0
	(Average annual percentage increase)	
Growth of Hospital Expenditures and Use, 1950-67		
Hospital expenditures.....	13.8	10.8
Population.....	2.3	1.6
Use per person.....	1.5	1.4
	(Days)	
Average Length of Stay in Hospitals		
1950.....	10.4	8.1
1967.....	10.2	8.3

<sup>1</sup>Excluding expenditures on nonprescription drugs.

SOURCE: Based on R. Anderson and J. T. Hull, "Hospital Utilization and Cost Trends in Canada and the United States", *Health Services Research*, Fall 1969, pp. 198-222.

In an attempt to extend the measurement of hospital "outputs" beyond the conventional recording of patient-days, an effort was made to develop a composite weighted index which also included

<sup>1</sup>Two reasons that have been suggested for the typically longer hospital stay in Canada are a more ample supply of hospital beds relative to the population, and more severe winter weather—see R. Anderson and J. T. Hull, "Hospital Utilization and Cost Trends in Canada and the United States", *Health Services Research*, Fall 1969, pp. 198-222; and L. S. Reed and Willine Carr, "Utilization and Cost of General Hospital Care: Canada and the United States, 1948-1966", *Social Security Bulletin*, November 1968.

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various laboratory tests, treatments, operations, and emergency and outpatient services.<sup>1</sup> This permits a more penetrating evaluation of factors affecting hospital costs. The evidence suggests that average costs decline, although not sharply, as hospital size and utilization increase. Also, the occupancy rate tends to be higher for larger hospitals.<sup>2</sup> Furthermore, fuller utilization is usually associated with both greater frequency of specific types of cases and better quality of care. Travelling costs and travelling time of patients, doctors and hospital staff must be considered in determining the appropriate size of hospitals.

### TOWARDS MORE ECONOMICAL HEALTH CARE

As stated at the outset of the chapter, our concern is with achieving an adequate and efficient system of health services for all Canadians. After outlining some of the principal factors contributing to soaring expenditures on health care, we suggest some possible ways of accomplishing more economical health services.

One of the obvious causes of rising expenditures on health care is an increase in the quantity of services provided. Not only are health services increasing to meet the needs of an expanding population, but also the amount of health care per capita is growing with increasing incomes and urbanization, and with accelerating technological advances.

A less tangible source of increasing costs is improved quality of health care. Although quality of health care is difficult to measure, a few indicators are: the declining incidence of communicable diseases (due partly to better preventive care) and of infant mortality; more-intensive training of doctors, nurses, and other personnel; and a wider range and availability of diagnostic tests and other services. There is also an increased variety of services, closely associated with the advent of new medical and allied specialists, new drugs, and more sophisticated equipment and facilities.

A third factor contributing to rising costs of health care is increased prices of inputs, especially wages and salaries which account, on the average, for about 80 per cent of health care expenditures. Starting from relatively low postwar levels, wages of many categories of personnel employed in medical institutions and occupations have

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<sup>1</sup>The calculations will be included in R. D. Fraser, *Canadian Hospital Costs and Efficiency*, Economic Council of Canada Special Study No. 13, Ottawa, Queen's Printer, forthcoming.

<sup>2</sup>The length of stay also tends to be longer in the larger hospitals, but this may be due to a higher proportion of serious cases.

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been involved in a catching-up process in a variety of ways. Also, hours per shift and per week have declined, and fringe benefits have been extended. Reduced hours, together with other factors, have contributed to an increasing ratio of hospital personnel to patients. Moreover, the more productive other industries become, and the higher the wages paid elsewhere, the more onerous the catching-up process is for labour-intensive service industries such as health care.

Other explanations for rising costs are of a motivational and institutional nature. There are few incentives for economic efficiency. Primary control over health services rests with the doctor and indirectly with various boards and agencies. Administrative skills, managerial efficiency and cost-consciousness have not generally been highly regarded or strongly supported in health care institutions and services. Either as cause or result, attitudes to both the use and provision of health care tend to limit choices to those in which clinical considerations may become so predominant that little attention may be given to economic considerations. In other words, a "pricing mechanism" to encourage economic use of resources may be weak or missing altogether. It is essentially a cost-plus system, biased towards health care in hospitals. Adequate but less-expensive alternatives outside hospitals for less-intensive kinds of care have generally not been covered by insurance plans. Moreover, the use in hospital insurance plans of yearly average per diem hospital rates as the basis for reimbursement makes the later less-intensive days of a patient's care financially attractive to hospitals, and may well have tended, in some cases, to lengthen the stay of many patients in hospitals.

It is sometimes alleged that professional licensing and the accreditation of training centres, as well as educational and institutional constraints on occupational mobility, tend to limit the supply of health care professionals below what is desirable for the protection of patients from incompetence and quackery, and to restrict competition.<sup>1</sup> Doctors are attached to particular hospitals, and they want a complete range of facilities and services on hand. Co-ordination among institutions and organizations is generally underdeveloped. Also, long-range planning in the health care field has been very limited.

We do not believe that rapidly rising health care costs should be constrained by efforts to limit universality and comprehensiveness of coverage of Canada's population for health care services. Indeed, we

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<sup>1</sup>For our views on competition policy relating to the service industries in general, and the medical field in particular, see Economic Council of Canada, *Interim Report on Competition Policy*, Ottawa, Queen's Printer, July 1969, especially pp. 151-153.



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believe that there should be wide access to such services and even greater efforts to help to assure ready utilization of available services among all Canadians. This is important, in our view, for *economic reasons*, as well as for *human and social reasons*, because lack of comprehensive coverage tends to distort the supply of health care services. For example, inadequate coverage or utilization of health care services may mean postponement of medical attention until health problems may have become serious, not only with consequent added discomfort to individuals, but also with resulting added economic costs to society. Moreover, it is important to have comprehensiveness of coverage for a wide range of health care services, so that the system does not simply work in a biased way towards treatment in the more expensive components, such as hospitals.

At the same time, the administration of a comprehensive health care system requires close attention to the avoidance of unnecessary demands on the system. In this context, we believe that a small deterrent to the unnecessary use of health services may not be inappropriate. One form which this could take—and, in fact, a form already existing in some provinces—is that of charging patients a nominal amount, or “utilization charge” for such services. Any such arrangement, however, should include adequate safeguards to exempt individuals and families with low incomes.

But the matter which requires most urgent attention in our view is that of achieving more economical health care through more effective use of the country's health care resources. We do not have a detailed blueprint for this. But we believe that the following suggestions directed to this end merit careful consideration. The suggestions are grouped by their relevance, first, to health care systems in general, and, second, to internal operating efficiency of specific treatment agencies, especially hospitals.

Probably the most important proposal for economizing on limited resources is to avoid wasteful underutilization of highly trained professionals by shifting tasks to less costly personnel wherever this can be done while maintaining competent service. We believe that there is considerable scope for the development of more economical “team approaches” in various forms, involving various “mixes” of general practitioners, specialists, paramedical personnel, nurses, social workers, psychologists, and other professionals. Such a team approach will normally mean greater specialization, increased delegation, and greater group responsibility. It has pervasive implications for job definitions, education and training, and the traditional physician-



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centred system of health services. But we believe that it would be useful to promote more experimentation with such approaches in the future—experiments such as those now being explored jointly by the Canadian Hospital Association, the Canadian Medical Association and the Canadian Nurses' Association regarding the transfer of responsibilities among health professions. Also, the incorporation of the team approach into medical education is appearing in training centres, with the development of health sciences centres in some Canadian universities.

If appropriate changes were made in the licensing laws to enable supporting paramedical personnel to carry out routine procedures under professional supervision, it could facilitate more effective use of resources in the health care field. Medical schools would need to step up training in the techniques of using the team approach, and appropriate remuneration procedures would need to be developed to encourage more use of medical social workers, psychologists, public health nurses, and paramedical personnel.

A search is under way in Canada for more effective and efficient systems of delivering health care, including consumer-organized group practices. Examples of consumer-sponsored group plans are the Saskatoon Community Clinic and the group health centres in Sault Ste. Marie and St. Catharines. Reports indicate a resulting substantial reduction in the use of hospitals. The Kaiser Foundation Medical Care Program in California, a prepaid group practice that is comprehensive and self-sustaining, has been able to achieve substantial savings, mainly because it has provided incentives to individual physicians to curb the cost of providing medical care.<sup>1</sup> Although there were also some savings in connection with investment, purchasing, and administration, standard medical practices and procedures were used. As a result of built-in incentives for each physician to keep costs down, Kaiser Plan patients pay significantly less for high-quality medical care than other California residents.

Health care systems usually differ considerably in the services they provide, however, which makes valid comparisons difficult. The *net* effect on all health care costs is what matters. A current joint study by the Ontario Government and the World Health Organization, comparing the Sault Ste. Marie Group Health Plan with a similar private insurance company plan, may provide some helpful insights

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<sup>1</sup>*Report of the National Advisory Commission on Health Manpower*, vol. 2, Washington, U.S. Government Printing Office, 1967, pp. 197-228

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into the impact of different organizational patterns on the use, costs, and quality of health services.

Also required is identification of the reasons why certain systems are more economical than others. More teams comprising health professionals, management consultants, and social scientists are needed to explore and evaluate alternative health care systems, with the objective of developing improved systems suited to the Canadian scene. There is considerable scope for increased research into socio-economic aspects of health care, with particular attention to the development and implementation of comprehensive incentive arrangements. In this context, the Ontario Committee on the Healing Arts concluded: "What is needed is experimentation in modes of providing general health care to the public through pilot projects with the energy and imagination that has been applied to the scientific and clinical aspects of medical care."

Better planning and co-ordination of treatment systems are required to avoid gaps and overlaps in services. Both needs and opportunities exist for making more sophisticated assessments of future health care requirements by using longer-term planning horizons and taking into account, in a systematic way, data about population trends, urbanization, incomes and other socio-economic factors affecting the pattern of utilization.

A patient should be cared for at the most economic level consistent with his medical needs. This implies the provision of less-expensive but adequate alternative facilities for mild, chronic, geriatric, ambulatory and convalescent cases outside hospital wards—in out-patient clinics, nursing homes, homes for the elderly or in private homes. If such additional facilities and services were available, costly hospital accommodation and treatment could be generally more restricted to acute and emergency cases. When cases treated in hospitals cease to be critical, they could be moved to the less costly facilities. Indeed, development of such facilities, with appropriate procedures for making them an integral part of overall health care systems, might release as much as 25 to 30 per cent of existing beds in many hospitals for patients requiring intensive care. Perhaps this change could be accomplished by means of financial incentives originating from the government health agencies but extending beyond the hospital throughout the entire health care system. This approach would require a highly competent and efficient screening procedure (i.e. testing and referral), perhaps as an integral part of expanded hospital out-patient departments. The potential savings from such

reorganization, while they should not be exaggerated, may still be considerable. In this context, careful consideration should be given to enlarged public support for more adequate nursing-home facilities, as well as for limited nursing care, as may be required, for individuals in their own homes.

Planning and co-ordination at the regional level is a promising development that should be accelerated. One of the regional patterns being proposed is the "satellite" system, centred on a metropolis and applying the principle of progressive patient care. The focus of the satellite system would be the efficient provision of comprehensive health care to its regional constituency. The less serious or less difficult medical cases would be handled by the "outer", cheaper, and more accessible health facilities of the system. These would, in turn, refer the more serious cases to inner-ring community hospitals or to a research and teaching hospital at the core. It should become possible under such a closely co-ordinated system to determine the role and most efficient size for each satellite institution within the system, and devise incentives for achieving better results. Performance could be rated according to other institutions with comparable patterns of patient care. The satellite system should also be able to achieve economies—for example, in bulk buying of drugs and supplies and in the use of a master computer. The special needs of hospitals that have important teaching and research functions will need to be taken into account.

Perhaps mindful of the historically very strong emphasis on "curative medicine", proponents of "preventive medicine" contend that some shift in emphasis towards *prevention* would economize on the use of scarce manpower and capital resources in the medical field in the long run. Although this would be very difficult to quantify, it is potentially very important, as is also industrial health. How to keep people healthy is, in fact, a question of major economic significance—for example, the economic loss due to sickness is very substantial, far in excess of that due to industrial disputes.

Turning now to the problem of raising the operational efficiency of hospitals and other health care agencies, we urge a more deliberate and concerted administrative approach to this objective. This amounts to a recommendation for better management, encompassing such things as: work studies; staffing according to workloads and patient needs; scheduling of diagnostic services; improved hospital design; use of computers for patient records, accounting, payroll and inventory control; electronic communication; electronic monitoring of patients;



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more automated utility services; more economical catering and laundering; standardization of certain supplies; and volume buying. The approach also implies more sophisticated administration and long-range investment planning by government health agencies, as well as individual institutions. Five-year budgeting, for example, should become a widespread and normal practice, rather than the rarity which it now is in this field. To implement these proposals for better administration, it would also be necessary to train and hire a larger number of skilled managers with a professional interest in efficiency, and give them greater scope for reconciling clinical and economic efficiency.

Attention should also be given to devising more effective incentives for efficient use of health personnel and facilities. The Report of the Task Forces on the Cost of Health Services suggested that governments amend their legislation so that part of any operating savings could be retained by hospitals for payment of incentive bonuses to employees and professional and administrative staff. Capital funds should be more readily provided for acquiring cost-curbing equipment.<sup>1</sup>

Incentives such as travel subsidies for patients might be employed in some situations to increase the use of existing medium-size and large hospitals before new hospitals are built. This recommendation stems from the finding that cost efficiency tends to improve as the size and capacity utilization of hospitals increase. There would appear to be considerable scope for action in this regard, since there are still hundreds of small hospitals and the average occupancy rate varies among public hospitals.

Financial incentives also are suggested to encourage faster "throughput" in hospitals, and the use of expensive facilities and equipment more fully on weekends, late afternoons and evenings, and to discourage overuse of diagnostic tests. Reducing the average length-of-stay of patients in hospitals by one day would be a substantial economy in the use of limited resources.

In conclusion, it is worth remembering that health care is for people. In placing heavy emphasis in this chapter on the need for more effective use of resources in health care, we do not mean to imply any disregard for human considerations. Increased efficiencies must not be achieved at the expense of dehumanizing health care. But now that health care activities are moving to absorb such a

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<sup>1</sup>Beginning in 1970, the Ontario Hospital Services Commission established an incentive program which permits hospitals to retain part of any savings made out of their operating budgets, and also removes disincentives impeding cost-reducing capital expenditures.



## *Health Care*

large and rapidly rising proportion of our national resources, it is both inevitable and desirable that the wider economic and social aspects of health care should become a matter of growing public concern. Individuals, both as consumers of health care services and as taxpayers supporting the rapid expansion of such services, are clearly becoming much more interested in this subject. Such interest, especially about the effectiveness of the health care system, has been too passive and indirect in the past. The main purpose of our discussion here is to provide a basis—admittedly still a very limited one in many respects—for better-informed public discussion about economic aspects of health care.

# 5

## *Higher Education*

**S**INCE THE beginning of the work of the Council, we have repeatedly emphasized the important role that education can play in furthering the social and economic well-being of Canadians. This role has many elements—some related to the fact that education has intrinsic value, and some related to the fact that education can help to promote economic growth and thereby help to satisfy more fully the broader economic and social needs, wants and aspirations of Canadians. One of the principal themes of our earlier analysis is that education, considered as an investment in human beings, tends to improve the employability and the productive capacities of individuals. In this Review, we turn to another important economic aspect of education—the effectiveness of the large and rapidly growing volume of productive resources being used *within* the educational system itself.

Although education in Canada is largely a provincial matter, it has a pervasive impact on the economy as a whole. By almost any measure, education now is Canada's biggest "industry".<sup>1</sup> There are about 6.5 million full-time students and teachers—nearly a third of Canada's population—involved in education (as well as hundreds of thousands more on a part-time basis) both in the formal education system and in a great variety of training programs. Expenditures on formal education and vocational training now account for about 8 per cent of the Gross National Product. As in the case of health care, a growing proportion of education expenditures have been shifting from the private sector to the government sector of the

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<sup>1</sup>In Chapter 2, education is included with "community, business and personal services".

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economy. Education is the largest category (over 20 per cent) of total government spending in Canada and now exceeds \$6 billion. Moreover, as indicated in our last Annual Review, such expenditures are expected to continue to increase at an average annual rate of about 8.5 per cent in constant dollars over the eight-year period 1967-75. This rate of increase is expected to be exceeded only in the case of government spending on health care.

We have concentrated attention in this Review on the *post-secondary* level of education, mainly comprising universities and community colleges. This is the level of education at which expenditures have been rising most steeply. During the last decade, postsecondary enrolment has almost tripled. Government spending on postsecondary education has been growing faster than 20 per cent annually in recent years. The rising demands and expectations for higher education are coming into sharper confrontation with alternative claims upon scarce resources. It is no less important here than in the health care field to ask questions about possible ways of making more effective use of resources.

As in the preceding chapter on health care, our concern here is with encouraging more efficient use of whatever resources are allocated to this service "industry". Until recent years, efficiency was largely a matter of feel and flair on the part of some dedicated educational administrators. But in the light of current and prospective developments, it is important that more widespread, systematic and intensive efforts be aimed at increasing the effectiveness of these expenditures.

Effectiveness in education needs to be measured against the goals and expectations set for it by society. When these goals are not clear, or not adequately understood, the result is likely to be a serious wastage of resources and considerable frustration. A much clearer consensus among Canadians is needed concerning appropriate goals for postsecondary education. The purposes of higher education consist, in our judgment, mainly of teaching, research, and service to the community (including, for example, applied research). "Service to the community" is stressed because of the increasingly widespread conviction that it is not sufficient to pursue knowledge for itself but that it must be put to work for social purposes, and that postsecondary educational institutions—especially when they are being so heavily supported by society as a whole—should be actively exploring a variety of ways in which knowledge can be more effectively applied to deal with the wide range of problems and needs of the modern society.

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We realize that "productivity in higher education" is a complex and sensitive subject. Higher educational institutions serve a variety of purposes and needs that are difficult to define or clarify with any degree of precision. Although expenditures on higher education can be regarded mainly as "investment in human capital", they also fulfil a consumption role. Intangible quality dimensions, as well as very difficult conceptual and measurement problems, are involved. Some people fear that autonomy and academic freedom are threatened by the growing insistence of governments on accountability. Since the taxpayer is supplying over 85 per cent of the funds for operating and capital expenditures in higher education, the real issue is what form the accountability should take. Additional complexities and sensitivities arise from the fact that intergovernmental relations are also involved—about half of the public funds for postsecondary operating expenditures are provided by provincial governments and about half by the federal government.

Among the questions increasingly being asked about higher education are the following: Are existing funds being expended wisely? Can economies be effected? Is there duplication of facilities and unused capacity? Does tenure of faculty have undesirable side effects on productivity? In view of the non-commercial nature of education services, can a more effective system of incentives for increasing productivity be instituted? Are decisions about the use of productive resources in universities becoming too decentralized to be consistent with high degrees of overall effectiveness in the use of such resources in these institutions? Many of these questions cannot yet be easily or satisfactorily answered—clarification would be required about the public purpose of postsecondary education, and more needs to be known about the economics of postsecondary institutions.

To provide a better understanding of some of the economic issues, and to focus attention on the importance of the effectiveness of the resources being used to generate "output" in universities and community colleges, this chapter outlines the growth of enrolment and expenditures for postsecondary education as a whole, and for universities and community colleges separately. It also includes some observations concerning the efficiency with which resources are used and suggests some possible ways in which greater efficiencies could be achieved. The chapter deals mainly with formal, rather than non-formal, postsecondary education, although the distinction is becoming less clear-cut all the time.

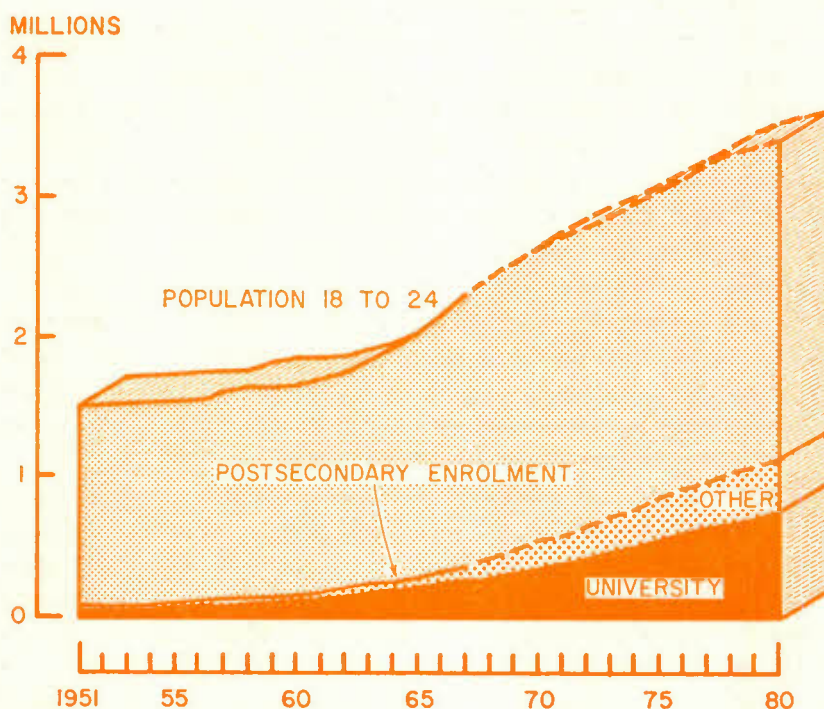


## Patterns of Growth

### GROWTH OF ENROLMENT AND EXPENDITURES

Full-time enrolment in postsecondary education is currently about half a million, compared with 165,000 a decade ago and 90,000 two decades ago. In other words, most of the increase in postsecondary enrolment took place during the 1960's. The rate of increase in recent academic years has ranged from about 10 to 15 per cent annually. As shown in Chart 5-1, an enrolment of over one million has been projected for 1980<sup>1</sup>. (There will also be rapid increases during this decade in part-time postsecondary enrolment.) It is expected that by 1980 the annual flow of graduates from postsecondary institutions may be nearing a quarter of a million. However, the *rate of increase* in postsecondary enrolment is expected to moderate during the 1970's.

CHART 5-1  
POSTSECONDARY ENROLMENT AND POPULATION  
IN 18-24 AGE GROUP



Source: Based on data from Dominion Bureau of Statistics and estimates by Economic Council of Canada.

<sup>1</sup>For details see Z. E. Zsigmond and C. J. Wenaas, *Enrolment in Educational Institutions, by Province, 1951-52 to 1980-81*, Economic Council of Canada Staff Study No. 25, Ottawa, Queen's Printer, 1970.

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A factor contributing to the tremendous growth in postsecondary enrolment in the 1960's—and a factor that will continue to contribute to substantial further growth in the 1970's—is the rapidly rising *number* of young people in the 18-24 age group. This, in turn, reflects the very high birth rates in the late 1940's and the sustained high birth rates in the 1950's. But the rising *proportion* of Canada's population attending postsecondary educational institutions has had a much greater impact on enrolment. About 20 per cent of the 18-24 age group now is enrolled in these institutions, compared with 10 per cent a decade ago, and the proportion is expected to exceed 30 per cent by 1980 (these proportions are lower than in the United States). Yet, even with the tremendously high rate of expansion in the *proportion* of the 18-24 age group enrolled in institutions of higher education anticipated for the 1970's, it is expected that there will be at least as many young people in this age group who are *not* enrolled in higher education in 1980 as in 1970.

The major postsecondary educational institutions are universities, technical institutes, community colleges, the CEGEP<sup>1</sup> and some other colleges in Quebec, and agricultural colleges. Throughout this chapter, these technical institutes, the CEGEP, and the community and agricultural colleges, are referred to as "community colleges". Although the increases in university enrolment have been rapid and sustained, the rate of expansion in community colleges has been even more dramatic, especially during the latter part of the 1960's.

The current level of government expenditures on higher education exceeds \$2 billion. These expenditures have been expanding rapidly due to soaring enrolment and increasing expenditures per student. It has been estimated that government expenditures on postsecondary education will expand to 1975 at about 15 per cent a year in constant-dollar terms, compared with about 5 per cent at the elementary and secondary levels. On the basis of the analysis in our *Sixth Annual Review*, such an increase in expenditures on postsecondary education would amount to about \$1 out of every \$7 of increased government revenue which rising taxable incomes would yield to all governments under conditions of strong and sustained economic growth.

Although most of the expenditures on higher education are being increasingly absorbed by governments rather than by individuals directly, individual students also make various outlays for their education. Their cash expenditures consist of tuition fees, residence or lodging expenses, purchases of books and other instructional supplies,

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<sup>1</sup>Collèges d'Enseignement Général et Professionnel.

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as well as education-related travelling costs. But by far the largest economic cost to these students is the potential earnings they forgo while continuing their education. If they were employed instead of attending universities or community colleges, their potential average earnings could well be in the range of \$2,000 to \$3,000 or more for the eight- to nine-month period of the academic year.<sup>1</sup>

### *Universities*

Full-time enrolment in universities is currently about 355,000, compared with less than 115,000 in 1960. It may rise to about three-quarters of a million students in 1980. By 1975 one out of every five in the 18-24 age group may be enrolled full-time in a university. Government expenditures on university education are close to \$1.3 billion, and have been rising about three times faster than potential Gross National Product.

A university's annual output could be said to consist of the total skills and knowledge which its students have acquired during the year. But such intangibles are very difficult to measure, except by certain "proxies" that are partial or indirect measures. For example, in some of our earlier analyses, part of the differentials in lifetime earnings between those who attended universities and those who did not were assumed to reflect the economic value that individuals derived from their university education.

Another way of measuring university output is to focus on students who have completed a formal course of education. An attempt was made by the Council to develop a measurement of the instructional output of a large group of 49 universities, based on the number of students who graduated with a degree or diploma over the 12-year period 1956-57 to 1967-68.<sup>2</sup> These graduations are compared with enrolment and expenditures of the same universities, taking into account enrolment shifts between university programs.

Table 5-1 provides information on the production of degrees and diplomas for the 49 universities.<sup>3</sup> The total number of degrees increased at about 12 per cent a year from the mid-1950's to the late

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<sup>1</sup>The other side of this coin, of course, is that to the extent that people are in the educational system rather than in employment, there is at least a short-term social cost in the form of output forgone for society as a whole.

<sup>2</sup>Details will be included in Walter Hettich, *Expenditures, Output and Productivity in Canadian University Education*, Economic Council of Canada Staff Study No. 33, Ottawa, Queen's Printer, forthcoming. The 49 universities account for about 85 per cent of total enrolment.

<sup>3</sup>It has not been possible to include students who leave university without completing their degrees, since there are unfortunately no adequate statistics available on the number of such withdrawals.



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1960's. The output of graduate degrees has been growing most rapidly. Master's degrees increased at a rate of 17 per cent a year, and doctoral degrees increased at a 12 per cent annual rate. Undergraduate degrees—in absolute numbers, almost seven times graduate degrees—increased at a rate of 11.5 per cent a year.

The table also reveals that the average annual rate of increase in graduate enrolment (about 21 per cent) has been almost double that of undergraduate enrolment. The growth in absolute numbers was much larger at the undergraduate level, of course. Wide variations in growth rates occurred in various undergraduate fields—ranging from about 18 per cent per year in science to 4 per cent in engineering.

The preceding paragraphs refer to full-time enrolment. For a complete description of university activity, information on part-time and summer programs should be added. In 1967-68, there were over 95,000 part-time enrolments in the 49 universities. Part-time enrolments increased during the mid-1960's at a rate of approximately 18 per cent a year.<sup>1</sup> In 1967-68, there were about 75,000 summer students enrolled in universities. Summer school enrolment has been increasing in recent years at a rate of about 8 per cent a year.

In general, university operating expenditures have been growing at almost twice the rate of enrolment and degrees. Table 5-1 presents information on the growth of operating expenditures for the 49 universities. All major expenditure categories have experienced very rapid increases—annual growth rates range from 22 per cent for academic purposes to 40 per cent for "other" items such as library operation, scholarships and alumni.

The very rapid increase in university expenditures reflects both the rapid growth of enrolment and rising expenditures per student. Operating expenditures per student in the 49 universities (excluding assisted research) increased at a rate of about 10 per cent a year during the 1960's, reaching about \$3,000 in 1968-69. Rising expenditures per student result from higher prices of human and material inputs, due in part to quality improvements and in part to inflation. Student costs vary considerably from province to province, faculty to faculty, and course-year to course-year; but changes in the mix of enrolment between less-expensive and more-expensive courses do not appear to have been a major contributing factor to increasing costs per student. Part of the explanation for this result appears to be that the relative shift towards more-expensive graduate

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<sup>1</sup>Part-time enrolment is concentrated in arts courses. In 1968-69, for example, the distribution of part-time enrolment by courses was: arts, 57 per cent; education, 12 per cent; commerce, 10 per cent; science, 5 per cent; engineering, 3 per cent; and all others, 13 per cent.



TABLE 5-1—GRADUATIONS, FULL-TIME ENROLMENTS, AND  
OPERATING EXPENDITURES IN 49 CANADIAN UNIVERSITIES

				Rate of Growth	
				1956-57	1959-60
				to	to
	1956-57	1959-60	1967-68	1967-68	1967-68
(Per cent per year)					
Graduations					
Degrees.....	14,002	17,392	49,581	12	14
Undergraduate.....	12,428	15,120	41,250	12	13
Arts—General.....	3,428	4,507	16,347	15	17
—Honours.....	645	768	2,523	13	16
Science—General.....	684	903	3,744	17	19
—Honours.....	254	428	1,229	15	14
Engineering.....	1,533	1,868	2,272	4	2
Education.....	1,179	1,822	5,689	15	15
Commerce.....	758	973	2,041	9	10
Health fields.....	1,730	1,871	3,808	7	9
Other <sup>1</sup> .....	2,217	1,980	3,597	4	8
Graduate.....	1,574	2,272	8,331	16	18
Master's.....	1,281	1,986	7,332	17	18
Arts & Science.....	614	833	3,255	16	19
Other <sup>2</sup> .....	667	1,153	4,077	18	17
Doctoral.....	293	286	999	12	17
Arts & Science.....	234	235	705	11	15
Other <sup>2</sup> .....	59	51	294	16	24
Diplomas.....	4,873	3,584	9,971	7	14
Enrolment					
(Thousands)					
Total.....	60.7	79.7	211.2	12	13
Undergraduate.....	57.6	75.1	187.2	11	12
Arts.....	16.7	22.5	65.9	13	14
Science.....	5.0	7.9	31.3	18	19
Engineering.....	11.3	12.6	18.0	4	5
Education.....	4.4	8.7	24.0	17	14
Commerce.....	3.9	5.1	11.5	10	11
Health fields.....	8.9	9.4	17.3	6	8
Other <sup>1</sup> .....	7.4	8.8	19.1	9	10
Graduate.....	3.0	4.7	24.0	21	23
Arts & Science.....	1.6	2.6	15.2	23	25
Other <sup>2</sup> .....	1.4	2.0	8.8	18	20
Operating Expenditures					
(Millions of dollars)					
Total.....	n.a.	115	627		24
Academic.....	n.a.	72	353		22
Assisted research.....	n.a.	18	103		24
Plant maintenance.....	n.a.	13	64		22
Administration.....	n.a.	6	34		24
Other <sup>3</sup> .....	n.a.	5	73		40

n.a.—not available.

<sup>1</sup>Including agriculture, architecture, fine arts, forestry, household science, journalism, law, library science, music, secretarial science, social work, and theology.

<sup>2</sup>Including education, engineering, and business administration.

<sup>3</sup>Including expenditures on libraries, scholarships, and alumni activities.

Source: Based on data from Dominion Bureau of Statistics.

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programs has been at least partly offset by the relative decline in enrolment in certain expensive undergraduate programs.

Research and "service to the public" have been omitted from the discussion of output in universities so far, because there is no practical way of measuring them satisfactorily in quantitative terms on the basis of available information. There is no doubt, however, that research output has increased considerably—some indirect evidence of this can be found in the data in Table 5-1 on assisted research expenditures. "Assisted research" represents funds received by the universities for the express purpose of doing research. The funds originated mainly from the federal government, which supports research through the National Research Council, the Medical Research Council, and the Canada Council, as well as through various government departments and agencies. Assisted research has grown in step with other major expenditure items and almost twice as fast as the number of degrees.

The rapid growth in university expenditures is also reflected in figures on capital investment. Such investment increased at about the same rate as operating expenditures in the 1960's—that is, at a rate of close to 25 per cent a year—and reached an estimated \$375 million in 1969. Construction of university buildings was one of the most conspicuous activities in many Canadian cities during the decade. These expenditures typically are about 80 per cent for construction and 20 per cent for machinery and equipment.

Our study shows that capital-intensity (i.e. volume of capital per full-time university teacher) has increased gradually over the past decade and a half. Similarly, the volume of capital per graduating student has also been rising. The output of graduates per full-time university teacher has remained fairly constant.<sup>1</sup> There may, of course, have been an increase in the *quality* of the graduates, resulting from the gradual upgrading of faculty and facilities, previously indicated to be factors contributing to rising expenditures.<sup>2</sup>

### Community Colleges

During the 1960's another form of higher education achieved prominence in Canada—community colleges. Their functions differ

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<sup>1</sup>A pioneering study of productivity trends in British universities, in which the number of degrees granted was used as a proxy for output, found no evidence of any increase in productivity between 1938 and 1962. See Maureen Woodhall and Mark Blaug, "Productivity Trends in British University Education, 1938-1962", *Minerva*, Summer 1965.

<sup>2</sup>Only quality improvements attributable to university education are relevant to trends in university productivity—the quality of graduates may also have improved as a result of better primary or secondary education, or of other factors.

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somewhat among the provinces where they exist, and where they are still at an experimental or evolutionary stage. In general, they can perhaps best be described as multipurpose institutions making post-secondary education more readily applicable to manpower needs by meeting the rapidly expanding skill and training requirements of an advanced industrial and service-oriented society, and, for an increasing number of students, becoming a bridge between secondary education and university. As the term "community college" implies, these institutions are generally more oriented to the local community than universities, especially in terms of the student population which they serve, and the scope and nature of the study programs they offer.

Community colleges are a mixed collection of some old, but mostly new, institutions totalling well over 100. In the rapid development of these institutions during recent years, considerable adaptability has been displayed in meeting the changing needs of society and the economy, with the result that a wider range of educational options has been opened up to high school students and adults. A larger proportion of students enrolled in community colleges are from lower-income families than in the case of students in universities, and the education level of the parents of university students tends to be considerably higher.

Despite wide differences among them, these institutions have certain educational characteristics in common. The completion of high school is generally required for admission to the diploma programs, but facilities are frequently provided for adults to acquire this prerequisite. Certain other programs do not require completion of high school. Unlike universities, community colleges grant diplomas or certificates rather than degrees.

In Ontario, the principal emphasis in these institutions is on occupation-oriented programs of one to three years' duration. Quebec has two streams—the career programs and the two-year transfer course to university. In Alberta and British Columbia, the equivalent of a two-year university program is offered in addition to occupational training. Some community colleges in Canada also offer general education without specific preparation for university or job orientation. In addition, many community colleges perform an important service by training manpower under government programs for apprenticeship and trades, and by providing remedial courses and retraining.

One of the most important functions of community colleges is adult education—providing many adults with an opportunity to

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continue learning on a part-time basis and to take preparatory courses for further formal study. These colleges also frequently serve their communities by enabling local groups to pursue their educational, social and recreational interests in public lectures, seminars, cultural workshops, athletics, and artistic performances, at nominal costs.

The community colleges expanded at an even faster rate than the universities in the 1960's, although the growth started from a very small base at the beginning of the decade.<sup>1</sup> Full-time enrolment in community colleges increased very rapidly in the latter part of the 1960's as systems began to emerge and flourish in some provinces. By 1969-70, such enrolment was approximately 140,000. (Part-time enrolment also expanded quickly and is approaching full-time enrolment in numbers.) Full-time enrolment in community colleges had risen to over 9 per cent of the population in the 18-21 age group. Although the rapid rate of expansion is expected to moderate during the 1970's, full-time enrolment in these institutions may advance to about 250,000 students in 1975 and perhaps to 350,000 by 1980.

The number of graduates from community colleges reached 17,200 in 1968-69, and may exceed 100,000 by 1980. Especially high rates of growth are evident in graduations in vocational courses such as business, electronics, and engineering technology. Recently, graduations in socially oriented programs, such as child-care training and recreation leadership, have also risen substantially. Thus far, the graduates of community colleges have generally encountered little difficulty in finding remunerative employment.

Expenditures of community colleges have grown extremely rapidly in recent years, mainly as a result of the surge in enrolment, but also due to rising costs per student. Total operating expenditures for community colleges in 1968-69 are estimated at \$200 million, and could be five times as great by 1980 in constant-dollar terms. Operating costs per student in 1968-69 are estimated at \$1,500. As in the case of universities, most of the expenditures of community colleges are borne by taxpayers.

Community colleges are offering an increasing range of choice in course programs, and have been expanding quickly into such fields as computer technology, library science, and social work. There appears to have been a shift in enrolment towards more expensive

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<sup>1</sup>Details will be included in Max von Zur-Muehlen, *Development of Community Colleges in Canada*, Economic Council of Canada Staff Study No. 34, Ottawa, Queen's Printer, forthcoming.



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programs. Very few programs are dropped, however, and in certain communities there may be unnecessary duplication in course offerings. Student-faculty ratios and teaching hours appear to have been reduced; and maintenance, administration, library, counselling, public relations, and community service costs have been increased substantially.

Capital expenditures by community colleges have also increased sharply. A considerable number of new institutions were founded during the past decade and the majority of existing colleges have been expanded or substantially changed. The heavy concentration on vocational courses requires relatively large investment in equipment and supplies. Moreover, obsolescence of some of the equipment is rapid, and replacement costs are rising. Advances in educational technology such as educational TV and programmed learning have not reduced costs noticeably. Unit costs in some new colleges are high because an efficient scale of operation has not yet been reached. On the other hand, in virtually none of these institutions are residences required; and expenditures on facilities for faculty and for extracurricular activities of students have also tended to be modest.

Questions are arising as to whether closer co-operation between these institutions and industry should be given greater emphasis and encouragement, to achieve the most effective results. Although in many European countries apprenticeship training and technical and business education have traditionally been conducted in industry, supplemented with formal education, Canada has not followed this pattern extensively. Recently, some European countries have moved more towards the Canadian emphasis on institutional education in which, in a shorter time period, students can acquire a broader general education and in which theoretical and practical education are combined. An appropriate combination of formal and practical training enables students to become more adaptable and potentially more mobile members of the labour force, and also provides a better basis for subsequent retraining.

### SOME SUGGESTIONS CONCERNING EFFICIENCY

Over the past decade, tremendous efforts have been devoted to achieving a massive expansion of higher education, in part reflecting a catching-up process from an unsatisfactory level in the earlier postwar period. These efforts have resulted in a huge enlargement of educational plant and equipment (including the establishment of a substantial number of new institutions); the enhancement and

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improvement of facilities available to students and staff; an extraordinarily large growth in staff, many of whom have had to be recruited and retained under the difficult circumstances of severe shortages of professional manpower in many fields; and dynamic growth and change in the scope and content of higher education at a time of accelerating expansion of knowledge.

During this decade, extraordinary progress was made in providing a more up-to-date and sophisticated system of higher education in Canada. In part, the catching-up process involved quality improvements, such as higher faculty qualifications and better facilities, including new forms of technology such as the computer. In general, these provided more and better education services, but did not result in cost reductions. Large salary increases also occurred in institutions of higher learning during the 1960's, in part reflecting adjustments to bring these more in line with comparable professional incomes, and in part reflecting the severe shortages of professional manpower. Moreover, the dynamics of the expansion involved a certain amount of building ahead in anticipation of continued substantial expansion of enrolment in the future.

The energies of the decision-makers who have carried responsibilities for achieving the remarkable advance of higher education have often been taxed to the limit—as they grappled with the complex problems of enlarging campuses in congested urban areas or starting up completely new institutions; of preserving universities as institutions dedicated to free inquiry while becoming increasingly government-financed institutions; and of coping with student unrest and the dissatisfactions of faculty members. Indeed, it is surprising under the circumstances that the question of achieving efficient use of resources has not been buried in the welter of these other problems. Yet, in fact, there has been a growing consciousness among administrators, both in the educational institutions and in government, that they are responsible not merely for “producing education” but also for systematic management and efficient use of the resources involved.

It is our purpose to encourage still wider awareness and more deliberate and urgent attention to this basic question of achieving more economical use of resources in postsecondary education. As already emphasized, higher education has been claiming a growing share of the nation's productive resources, both in terms of capital and in terms of its most valuable manpower. Moreover, despite the prospective moderation in the *rate of increase* of student enrolment in institutions of higher learning during the 1970's, very large

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continuing increases in numbers are in prospect. These institutions, therefore, may continue to claim a growing share of the nation's productive resources for some years to come. Against the background of high and rising wants and aspirations of Canadians in many different fields, and of inadequate economic resources to satisfy all of these wants and needs, strong growth in postsecondary education can only be accommodated by slower growth than would otherwise be possible in the use of resources to serve other purposes.

A quarter of a century ago, when postsecondary institutions were a very small factor in the use of resources in our system, and when a substantial proportion of these resources was paid for through private expenditures, this question was much less important. But now these conditions have changed. At an annual rate now exceeding \$2 billion, government expenditures on postsecondary education are approximately the same order of magnitude as total expenditures of hospitals, or total government transfer payments to elderly people under the existing old-age security and pension plans, or total spending by consumers on new automobiles—and in the past decade, all of these have been growing more slowly than expenditures on postsecondary education.

The fact that university operating costs and capital spending have been growing at twice the rate of enrolment and degrees granted raises the question as to whether resources are being used as effectively as they could be. There are, of course, no simple or easy prescriptions for achieving more effective resource use in postsecondary institutions. The clarification of society's goals and objectives for higher education is almost a prerequisite to any meaningful assessment of this matter. This is especially so because education is a long-term process. Yet the specification of goals and objectives for higher education is a very difficult task. Postsecondary institutions have become highly complex organizations, differing widely in the scope and nature of their activities, serving a wide variety of purposes and needs, and attempting to accommodate a very broad range of demands for different kinds of education and training for individuals who have widely differing capacities and interests. Despite these complexities, however, it is urgent that strong and continuing efforts be made to define and clarify the aims and objectives of postsecondary education—both of particular institutions and of the larger systems in which they operate. The institutions themselves should play a major role in these efforts, but in any event, the



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community at large, through its elected representatives, will undoubtedly press for clarification.

The difficulties in clarifying goals do not obviate the need for pursuing efficient use of resources in postsecondary education in the light of existing objectives, discussed in the preceding sections on universities and community colleges. What is needed most, in the first instance, is in our view an increased consciousness on the part of all those who have responsibilities affecting the commitment of resources in this field (including, incidentally, many decision-makers who do not have any responsibility for raising such resources) that the achievement of efficiencies and economies must stand near the apex of considerations brought to bear on the decisions they make. The fundamental issues concern the efficient utilization of manpower, economies in the use of capital and other materials and services, and the mobilization of productive resources to best advantage. In this context, there must be adequate scope and authority for administrative decision-making at various levels. This has relevance both to wider decisions relating to the development of postsecondary systems and to those affecting the use of resources within particular institutions.

At the aggregate level, the rapid expansion of higher education has forced provincial governments to develop new financing policies. Perhaps the most striking innovation has been the introduction of "formula grants" in an attempt to deal equitably with universities. Six provincial governments now employ formulas of some kind in allocating funds for university operating expenses. Ontario and Alberta are also developing formulas for capital grants.

Although formula grants have much to be said for them, especially on grounds of equity, they may also pose economic problems. A formula makes adjustments by attaching different weights to student programs—weights that are intended to reflect relative student costs. A problem emerges, however, if these weights are unintentionally out of line with actual unit costs, or if there is a substantial difference between average and incremental costs. In such a situation, the universities may tend to stress those programs which are overweighted in order to get extra money.

It is occasionally argued that such formulas can provide a means of curbing the rise in education expenditure. This claim appears to be unfounded. Formulas are designed to ration out government grants to universities on the basis of the number of students enrolled in



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approved programs. As long as the number of students keeps increasing, and unless quality and price increases of inputs are offset by improvements in productivity (which does not appear to have been the case during the 1960's), total expenditures on higher education will continue to rise.

As emphasized earlier, postsecondary education is a sector of the economy in which the proportion of private financing has declined very considerably, while the degree of public support has grown substantially. The major driving force behind this shift has clearly been to remove financial barriers impeding access to higher education, and to help to assure that all young Canadians can have an opportunity to go on to higher education if they have the ability and will to do so. But this large shift to government financing is giving rise to a growing array of questions about its implications for our society—for example, implications about its distributional effects (upon different income groups, different regions of the country, and especially between generations), and even about its possible implications for effective use of resources within postsecondary institutions.

Some curtailment of the growth of *public* expenditure on higher education might be accomplished without any significant adverse effects on the quantity and quality of higher education by reversing the trend towards a declining proportion of expenditure covered by student fees. But under any arrangements that might be adopted to this end, it would be essential to make sure that no young person who has the ability and motivation for higher education should, as a result of inadequate current access to financial resources, be deprived of an opportunity to proceed with higher education. A number of such arrangements for replacing some public financing with larger private financing have been proposed and discussed in recent years—for example, income-related assistance programs which let the student borrow freely for his education while committing him to the repayment of a stated percentage of his income to the loan fund after graduation.<sup>1</sup>

Possibilities also exist for increasing efficiency in the systems of postsecondary education. For example, while there should be appropriate competition between postsecondary institutions (not dissimilar

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<sup>1</sup>A proposal along these general lines has, for example, been explored by a Subcommittee of the Council of Ministers of Education. Also, for a description of such a proposed scheme for Ontario, see Gail C. A. Cook and David A. Stager, *Student Financial Assistance Programs, A Report to the Ontario Committee on Student Awards*, Institute for the Quantitative Analysis of Social and Economic Policy, University of Toronto, 1969.

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to the kind of healthy competition that needs to be encouraged between firms in the same industry as a means of spurring efficient resource use for the benefit of consumers), there is also the danger of rivalry among institutions that could result in unnecessary duplication of specialized programs. The possibilities for specialization and co-ordination between institutions in various regional groupings should therefore be kept under constant review—preferably, as has already emerged in some regions, on the basis of co-operative arrangements among the institutions themselves.

Although there are indications that community colleges and universities have catered to somewhat different socio-economic levels of the population, a question that deserves more careful exploration is whether there may be additional possibilities for the community colleges to provide, at least equally effectively, and perhaps at lower cost, some of the educational programs previously available only at universities. As the community colleges develop and a more adequate basis emerges for assessment of their activities, there may also be the opposite question—whether universities could more effectively provide programs initially developed in the community colleges. More generally, there is obviously a need for closely co-ordinated development between the university and non-university institutions in the interests of making the most effective use of all of the productive resources in higher education.

More widespread consideration also should be given to increasing the effectiveness of postsecondary education by the use of courses that alternate periods of on-campus instruction with practical experience.

Turning now to resource use within postsecondary institutions, we believe that, as in health care, the role of management requires upgrading. Methods of administration require modernization and adaptation to new needs. In contrast with the United States, where there are a considerable number of educational programs for training university administrators, no such programs have apparently yet been established in Canada. Such programs are needed in Canada to train and develop a much larger number of administrators for postsecondary institutions. High degrees of administrative skills and competence are now essential for effective operation of these very large and complex institutions. The special training, moreover, should be provided in faculties of administrative studies.

Average class size and teaching loads are key factors affecting expenditures per student. When quality considerations are also taken

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into account, however, it is possible that the most effective utilization may not always be positively associated with relatively large sizes of classes or heavy teaching loads. More widely used team teaching with the aid of student assistants may offer possibilities for some economies. But good information about, and continuing objective scrutiny of, such matters is needed. Average teaching loads vary considerably among institutions, but appear to have been light in emerging institutions, and declining generally (apparently reflecting many factors, including a trend in universities to increased research activities in relation to instruction, and the relative growth of graduate studies for which more lecture preparation may be required).

Also, there has been a noticeable tendency towards proliferation of new courses and resistance to discarding old courses whose relevance to changed conditions may be increasingly questioned. Tighter evaluation of program priorities is needed. It is unrealistic and wasteful for each institution to try to develop programs in all, or even most, fields of study or training. Two other matters which deserve attention are the possibility of alternating course offerings from year to year and a careful monitoring and evaluation of the costs and benefits of auxiliary services.

It has been said that the last great educational breakthrough was the printed book. More recent efforts to economize on such expensive inputs as teachers by introducing modern technology have been largely a matter of trial and error. Closed-circuit TV appears to work well for specialized technical instruction, but requires further development to be effective for large basic classes. The cost-effectiveness of TV and other forms of audio-visual instruction in higher education needs further study. Expensive computer services should be "priced" or otherwise rationed to users. More generally, the impact of technology on cost merits analysis by major items as an integral part of the decision-making process.

Objective standards or incentives to encourage more economical construction and utilization of buildings appear to be needed. Also, we believe that greater attention should be paid to the design of buildings in such a way as to permit greater flexibility for unpredictable future uses.

Although a few universities and several community colleges may not have reached their most economical size, in general, further significant growth in the size of most postsecondary institutions does not appear to offer a promising source of economies. As in the case of health care, the alternative of transportation subsidies (for students)

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merits study. Preliminary steps are being taken to centralize specialized library facilities on a regional basis with efficient interlibrary loan arrangements, and this development should be more widely extended and strengthened.

Part-time study and summer sessions have important implications for the efficient use of plant and buildings. Most part-time students attend classes in off-hours (evenings and weekends) when buildings might otherwise be empty. Summer sessions take place after the regular semester has come to an end. Thus both types of programs facilitate fuller and more efficient use of the invested capital. In addition, because training and knowledge can become obsolete, it is desirable to offer people who are already part of the labour force an opportunity to continue, complete, or update their studies on a part-time basis.

In more general terms, postsecondary education—in fact, all education—must be responsive to basic social needs. One of these needs is to provide education more economically, so that other needs in our society may be more adequately met.



# 6

## *Commercial Policy Issues in the 1970's*

**C**OMMERCIAL policy is one important influence on the kinds of industries a country has, their relative size, growth, and regional distribution. The postwar industrial changes discussed in earlier chapters have been substantially affected by basic shifts in the trade policies of Canada and other large countries since the 1930's. Canada will soon face major commercial policy issues that could have a significant bearing on the country's economic development in the 1970's and beyond. There is a need to focus attention on these before the time for decisions arrives. That is the main purpose of this chapter.

### CANADIAN TRADE IN BRIEF PERSPECTIVE

Against the background of a substantial reduction in trade barriers since the Second World War, Canada, like other industrial countries, has come to rely more and more on foreign trade to sustain and improve its economic performance. Many factors besides commercial policy have, of course, contributed to Canada's trade growth, including the growth of domestic markets which have provided a stronger base for successful export expansion in various industries. Exports now equal about half the output of Canada's goods-producing industries, and nearly half the goods supplied to Canadians are imported. Growth of exports and imports facilitates more efficient use of productive resources, permits greater specialization, and helps to reduce costs and to increase real income per capita.

Despite the many economic differences between industrial nations in the modern world, there is a remarkable common denominator

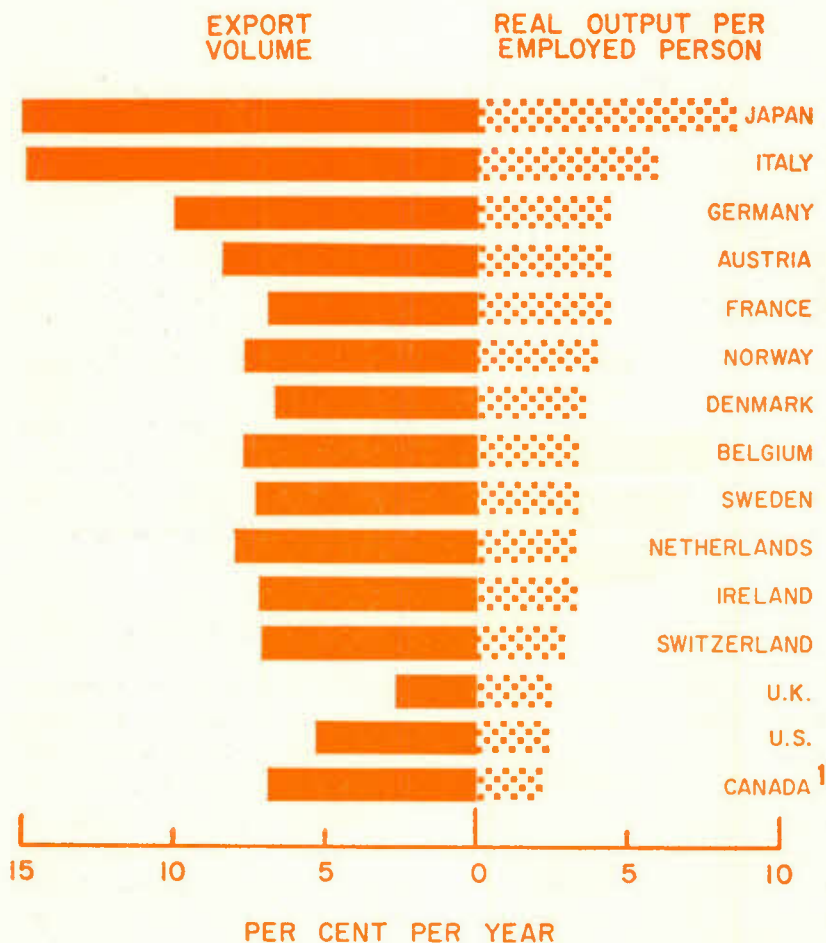
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among them—high (or low) growth of output per person goes with high (or low) growth of exports, as illustrated in Chart 6-1. The

CHART 6-1

### GROWTH OF EXPORTS AND REAL OUTPUT PER EMPLOYED PERSON, SELECTED COUNTRIES, 1955-67

Among industrial states, higher growth of real output is associated with higher growth of exports . . .



<sup>1</sup>In Chapter 2 of our *Fifth Annual Review* and in Staff Study No. 23, some of the reasons for Canada's relatively slow productivity growth were examined. See also Staff Study No. 28 which updates the information and analysis of Canada's productivity growth contained in Staff Study No. 23.

Source: Based on data from Organization for Economic Co-operation and Development, and Dominion Bureau of Statistics.

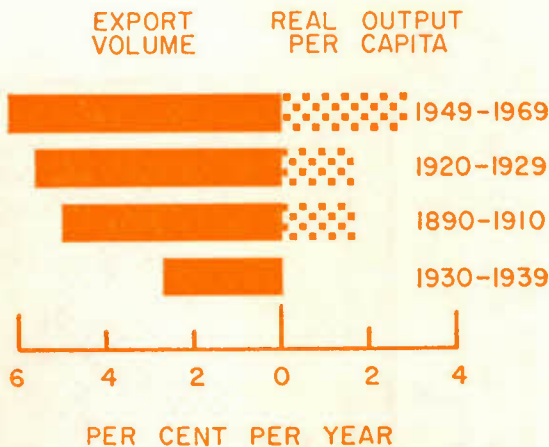
same sort of picture would appear for import volume if it had also been charted. Trade volume has typically grown about twice as fast as real output per person. The growth of world trade has been a multilateral affair, featuring a rapid rise in the exchange of manufactured goods among industrial countries, and a close two-way connection between rising trade and rising productivity.

Chart 6-2 shows that a similar kind of relationship has existed historically in Canada—high growth in real output per capita occurs side by side with high growth in trade; conversely, as in the Great Depression of the 1930's, both slow domestic economic growth and slow trade growth occur together.

CHART 6-2

GROWTH OF CANADIAN EXPORTS AND REAL OUTPUT PER CAPITA, SELECTED PERIODS, 1890-1969

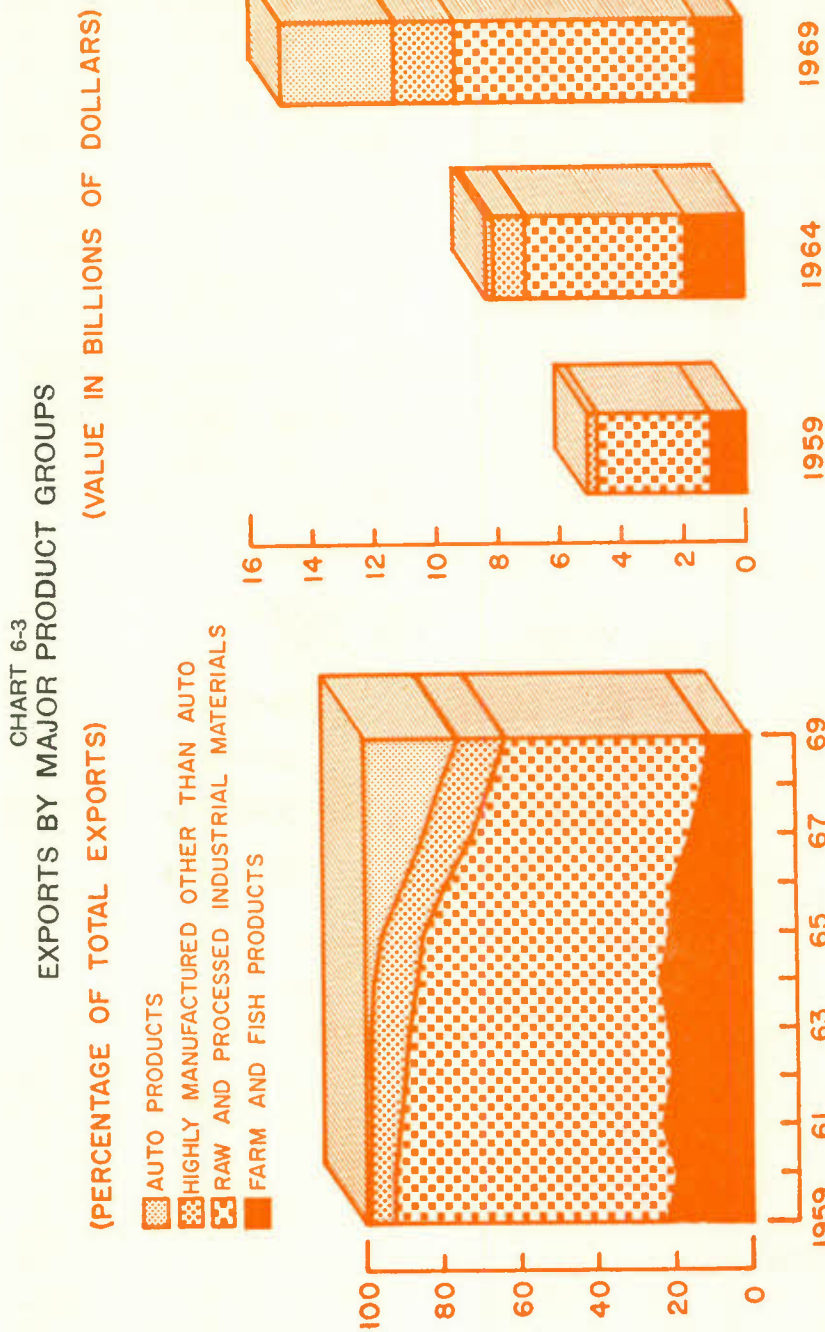
... and for Canada, a similar association is seen over the decades.



Source: Based on unpublished data from K. A. H. Buckley; A. Maddison, "Growth and Fluctuation in the World Economy, 1870-1960", *Banca Nazionale del Lavoro Quarterly Review*, June 1962; Dominion Bureau of Statistics; and Economic Council of Canada.

A strong upsurge of Canadian exports in the 1960's was led for the first time by advanced manufactures, and sustained by rising sales of industrial materials. Annual exports of goods nearly tripled in the 1960's, outstripping the sharp rise in imports, so that the trade balance improved by nearly \$1.5 billion. At the same time, Canada's annual deficit on services increased by \$0.5 billion. There has been a rising

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Source: Based on data from Dominion Bureau of Statistics.



## Commercial Policy

surplus of goods exports offsetting a rising deficit in service transactions.<sup>1</sup>

Chart 6-3 shows the decline in the percentage of exports accounted for by resource-based products (including grain), and the rise in automotive and other highly manufactured products to about 40 per cent of the export total in 1969.

Table 6-1 shows the distribution of exports in 1969, in terms of commodity components and country of destination. The United States is not only the largest market, but also grew rapidly throughout the 1960's. It is by far the largest market for highly manufactured and processed resource products; exports to overseas industrial countries are mainly resource-based products. In the 1960's Japan constituted the fastest-growing export outlet, and the United Kingdom the slowest, among big countries.

TABLE 6-1—PERCENTAGE OF CANADIAN EXPORTS OF  
COMMODITY GROUPS, BY COUNTRIES, AND EXPORT  
VALUE IN 1969

Commodity Group	Percentage of Group to:						Value of Group (\$ million)
	U.S.	U.K.	EEC	Japan	Other	Total	
Farm and fish items.....	41.7	17.5	8.6	6.7	25.5	100.0	1,486
Raw industrial materials.....	55.7	9.6	12.6	11.4	10.7	100.0	2,474
Processed industrial materials...	69.5	10.2	6.0	4.4	10.0	100.0	5,241
Highly manufactured products..	86.8	1.4	1.7	0.3	9.8	100.0	5,630
All commodities.....	71.0	7.5	5.7	4.2	11.6	100.0	
Value by destination (\$ million)	10,556	1,113	851	626	1,724		14,870 <sup>1</sup>

<sup>1</sup>Includes some special commodity exports not shown separately here.

SOURCE: Based on data from Dominion Bureau of Statistics.

## CANADIAN COMMERCIAL POLICY

Major historical changes have occurred in Canadian commercial policy—in particular, Canada's national tariff policy of 1879, its involvement in the general escalation of trade barriers in the 1930's and the creation of a preferential tariff system among Commonwealth

<sup>1</sup>See Economic Council of Canada, *Sixth Annual Review*, Ottawa, Queen's Printer, 1969, pp. 79-81. To even out special influences, the comparisons are based on averages of 1958-59 and 1968-69. Service transactions include payments and receipts for transport, tourism, interest, dividends, business services, and others.

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countries, and its participation in the world movement towards freer trade over the past quarter century. In these past situations of major shifts in commercial policy, external changes in the trading policies of other nations—especially the United States and the United Kingdom—had a large influence on Canada's actions.

Several factors together signal the approach of another period of major commercial policy issues in the 1970's. British entry into the European Economic Community (EEC) would imply a potential shift in world trading patterns and would raise questions about how the GATT countries as a group would respond to such a change. This major consideration arises at a time when advancing technology means that large markets are becoming more important than ever for productive and competitive performance of manufacturing industries. The rising role of the multinational firm in organizing world production and trade reflects, among other things, the importance of technology combined with relative freedom to move goods across national borders. The Canadian economy and its world ties are incomparably larger and more complex than they were even a decade ago, and our responses to fundamental changes occurring in the world must be well-informed and carefully articulated if they are to be adequate for our needs. In this context, we urge that increased attention be devoted to Canada's current and prospective trade problems and opportunities, both in the federal government and among private groups and individuals.

In the past, Canadian commercial policy focused strongly on two themes: (a) negotiation of reduced tariff and other barriers to our exports to foreign countries, particularly for resource-based products in which it was considered that Canada had a "natural advantage"; and (b) the maintenance of protection for a considerable range of manufactured products, mainly on the premise that protection was required if the country was to maintain various lines of industrial activity and employment. The highest tariffs have generally been imposed on final products, and higher tariffs have been set for partly manufactured goods than for raw materials used in manufacturing. This tariff structure tends to keep raw material costs relatively low. It does, however, permit processing and manufacturing activities to be conducted at costs that are high relative to production costs in other countries with large internal markets or tariff-free access to large external markets.

Only in more recent years, with the advent of the Kennedy Round and of special trade arrangements with the United States, has there

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been some tendency to focus on *free* trade opportunities for exports and imports of manufactured products in order to gain the benefits of specialization and large-scale production in the more advanced manufacturing industries.

There are good economic reasons for dissatisfaction with some of the results of Canada's commercial policies—in particular the emergence of a high-cost structure of production for advanced manufactures. Canada's manufacturing industries are often characterized by small-scale—and, more important, by rather unspecialized—production, and by high unit costs, despite our advantages in supplies of basic materials and labour, and our access to first-rate technology. A central consideration for commercial policy in the 1970's must be how best to obtain a better cost performance in manufacturing.

### THE CHANGING TRADE ENVIRONMENT

In the 1940's there was a powerful commitment by leading countries, including Canada, to change the restrictive trade policies that had been so costly during the 1930's. In 1947, the General Agreement on Tariffs and Trade (GATT) was negotiated, and large-scale tariff cuts were agreed upon. Negotiation of further multilateral tariff cuts continued thereafter, but at a slower pace, until the Kennedy Round in 1964-67.

The Kennedy Round negotiations stemmed from the U.S. response to the prospect of free trade within most of Western Europe. The agreed tariff cuts are large, although they fall short of the initial objectives of creating large sectors of multilateral free trade and cutting both U.S. and European tariffs in half. The big countries undertook to cut tariffs on 70 per cent of their *dutiable*, nonagricultural imports, and the average reduction was about 35 per cent of existing rates of duty. In most industrial countries, tariffs on *most* manufactured imports will not exceed 10 per cent by 1972, though some substantial duties remain.

Both the 1947 and 1967 GATT tariff reductions meant major changes in the climate for world (and Canadian) trade. In the interim, there were four smaller tariff negotiations, and important reductions in the use of import quotas, especially when European currencies became convertible in 1959. These steps maintained the movement towards freer trade, minimizing the risks of a return to protectionism by big countries such as the United States.

One of the principal features of the modern trading world is the fact that most industrial nations, singly or in groups, now comprise



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tariff-free markets of at least 100 million consumers each. In the 1950's, six countries formed the European Economic Community (EEC), and Britain and other nonmembers formed the European Free Trade Association (EFTA) to remove tariffs on industrial trade among themselves and to bargain with the EEC. After earlier difficulties, it seems likely that Britain and other European countries will join the EEC in the 1970's, and that Western Europe will thus become an industrial free-trade unit maintaining a common tariff against nonmembers.

Questions now arise about the course of world trade policy after the Kennedy Round tariff reductions are completed in 1972, and in view of the prospective enlargement of the EEC. These involve the commercial interests of Canada, the United States and many other non-European countries, so that some broad adjustments in trade relations will no doubt be required. The basic issue is whether the emerging EEC group and the United States will respond by further movements towards freer trade, or whether there may be a swing towards protectionism for industries inside these huge markets.

In addition, there are four essentially unresolved problems from the 1960's that remain to be tackled internationally:

1. *Improved arrangements for agricultural trade, particularly wheat, feed grains, and beef.* Trade in most farm products has not shared in the reduction of trade barriers for industrial products under GATT. This has imposed costly problems of adjustment on Canada's grain economy and created a need to find profitable markets for alternative products. Virtually all countries, including Canada, impose severe restrictions on agricultural imports, and some use massive export subsidies. These agricultural programs impose heavy and rising economic costs on consumers or taxpayers in various countries. As these become more apparent, it should be possible to develop new initiatives aimed at more efficient agricultural production and marketing on a world scale. Canada has a large stake in such progress.

2. *The reduction of nontariff distortions in trade.* Such distortions may result from the use of a great variety of measures by governments, such as subsidized exports and very easy credit terms, discrimination in purchasing practices, unnecessary health or safety requirements, discriminatory tax measures, informal guidelines for importers, and others. As tariffs have been cut, such devices have caused increasing concern. Since they are not regulated nearly as well as tariffs by international agreement, there is a temptation for governments to employ them for protective purposes. A GATT working



party is preparing the way to negotiate this issue. The painful lack of progress in reducing distortions in agricultural trade, against the background of national programs to support agriculture, serves as a warning that the reduction of nontariff distortions to industrial trade may be difficult to achieve. But here, too, Canada has much to gain, especially if its more advanced manufacturing industries are to have an opportunity to grow in a strong and sustained way over the next decade or two.

3. *Special trade arrangements for developing countries.* Such arrangements have been evolving as a result of activity in the United Nations and GATT since the mid-1950's, and more recently in the OECD. The industrial countries have recently offered preferential tariff rates on many imports from developing countries. But high-income countries generally continue to restrict some low-cost imports. This is a further area for negotiation. More two-way trade is widely considered to be a requirement for stimulating more satisfactory growth in the developing countries, and for increasing the effectiveness of aid granted to them by the more advanced countries.

4. *The modification of the preferential tariff system and the resolution of other trade problems that would arise from British entry into the EEC.* Britain's share of Canadian exports declined from 16 to 8 per cent during the 1960's, as the relative importance of the United States and Japan rose. Thus British entry into the EEC could pose significantly fewer difficulties for Canada in the 1970's than a decade ago, but it would still raise serious problems for some exports, including grain and several processed forest products and minerals. Perhaps 50 per cent or more of existing Canadian exports to Britain would experience some deterioration in their competitive position if Britain were to adopt the existing EEC tariff and nontariff systems for regulating imports. The terms of GATT provide an opportunity to seek changes in these systems, to ensure that any European merger would not reduce market access for exports of other countries. Accompanying such adjustments, revision of the Canadian preferential tariff system, stemming from the withdrawal of Britain as a preferential trade partner, might be used to facilitate some accommodation to Canadian interests. Such revision might involve abolishing preferences on certain products, and reducing the most-favoured-nation tariff on such products. Moreover, such revisions could perhaps also have attractions for trading partners such as the United States and Japan, and facilitate further accommodation of

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Canadian commercial interests in negotiations with these other partners in the event that any enlargement of the EEC were to be accompanied by a general round of commercial policy adjustments among the GATT countries.

From a long-term point of view, the markets in the enlarged EEC and other overseas countries are of considerable importance. Although two-thirds of Canada's exports are destined for the United States, which will remain the dominant market, it is also true that Western Europe, Japan, and other overseas countries are large and growing markets for many products that Canada can produce competitively (Table 6-1). For some products, overseas markets are the chief export outlet. Exports to overseas countries more than doubled in the 1960's from \$2.0 to \$4.3 billion. An enlarged EEC (including Britain and some small countries) would account for about 50 per cent of Canada's exports to overseas countries.

Beyond these more immediate tasks, *there is the more fundamental issue* of how Canada will respond to the "new generation" of big industrial markets, big international firms, and the acceleration of technological change. Access to a large market for industrial products will undoubtedly be even more important in the future than it has been in the past.

It is relevant to recall that Canada's position among industrial countries has special features:

—*Canada is one of the few industrial countries without duty-free access to a large market for all of its manufactured products.*

—*Canada has some special trade arrangements with the United States which provide an integrated market for some manufactured products*, most notably the Automotive Trade Agreement of 1965. There is also the defence production-sharing arrangement, which aims at improving productivity and minimizing trade deficits in defence-related goods. In the primary products area, both Canada and the United States have policies regulating trade in oil, and U.S. import regulations have applied in special ways to Canadian oil during the 1960's. The possibility of bilateral arrangements for energy products has been raised at official levels.

—*Canadian duties in several trade sectors are sufficiently high for this country to be regarded now as having a relatively high tariff*, at least among the more industrially advanced nations. Moreover, the structure of the tariff, with import duties ranging from free to 25 per cent (or more in a few cases), is widely held to foster an inefficient pattern of manufacturing production with relatively high unit costs

## Commercial Policy

of output, which are reflected in turn in generally high costs of input for industries purchasing components for *their* production.

These basic points will be considered in turn.

### *Access to a Larger Market*

After 25 years, the world climate favouring freer trade has become a basic factor in business investment decisions and the flow of trade. The Canadian economy has been shaped in many ways by a relatively open world economy. But the continuing gap between Canadian and U.S. levels of income, and the experience of European countries participating in large market areas, has focused attention on the possibilities of more rapid gains in Canadian productivity through participation in a large free-trade area.<sup>1</sup>

Many economists believe that free trade with the United States would raise Canadian productivity and average real living standards substantially. Their analyses suggest that consumers in all parts of Canada would benefit from such an arrangement. They also suggest that there would be further significant benefits arising from improved production efficiencies. Some of the latter would undoubtedly emerge in both eastern and western provinces, perhaps especially in coastal locations with access to large seaboard markets, but a very substantial part of these production opportunities would accrue to favourably located manufacturing industries in Central Canada.

Because of the economic benefits envisaged, the idea of a Canada-U.S. free-trade arrangement has been a recurrent one in Canadian history—in fact, one which has been promoted or explored, on some occasions at Canadian initiative, since the U.S. abrogation of the free-trade arrangement existing between these two countries in 1854-66. But any such arrangement in today's world would involve far-reaching political, social and cultural, as well as economic, considerations, including very complex realignments of Canada's relations with overseas countries as well as with the United States. In view of such complexities, many Canadians who have studied free-trade possibilities for gaining access to big markets for Canadian industry have appeared generally to prefer the idea of participating in an arrangement encompassing several industrially advanced countries.

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<sup>1</sup>In addition to studies initiated by various individuals, the Private Planning Association of Canada has sponsored a series on *Canada in the Atlantic Economy*. These books deal essentially with the implications of Canadian participation in a large free-trade area, including the United States and other countries.



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Economic benefits to Canada from joining a large free-trade area would be realized mainly after a period of adjustment. Some sectors of the economy could conceivably adjust rapidly; others would require more time. If Canada were to pursue this path, adequate adjustment programs must be available for the industries and workers concerned to assure that national efficiency goals are achieved and that groups temporarily hurt by the change are helped to adjust. In principle, this is little different from the approach we have recommended to deal with adjustment problems which arise in any case in a dynamically changing economy.

The possibility of entering a large free-trade area depends, of course, on the attitudes of prospective partners. The world position of the United States may mean that any free-trade area including that country would require special arrangements with nonparticipating countries, including the less-developed countries. Since there is a general movement to ease trade barriers for the less-developed countries, this might well happen anyway. But more difficult adjustment questions would be posed in connection with other nonparticipating countries. The practicability of any early move to a free-trade area involving several countries is, however, open to serious question, especially if enlargement of the EEC with its attendant negotiations and adjustments becomes a major concern of international commercial affairs in the 1970's.

### *Selective Trade Arrangements with the United States*

Another conceivable route towards economically beneficial access to larger markets for Canadian goods is through additional special or selective arrangements with the United States. There would clearly be considerable problems involved in any such approach, since it would be difficult to anticipate the attitude of the United States, as well as that of overseas countries whose interests would also be affected. Within the Canadian economy, there would be the complex and formidable task of deciding which industries to select for special arrangements, and with which protected industries they would coexist. It would also be well to recognize that, if this approach were to be pursued, the United States might want to broaden the arrangements to include industries and products of special interest to them.

Another major issue for Canada would arise if U.S. trade policy were ever to shift seriously in a protective direction. There are some strong internal forces in the United States working in the direction of



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increased protection. Any strengthening of these influences would increase the possibility that the present fairly free flow of goods could be impeded.

U.S. commercial policy since 1947 has generally been outward-looking. This has benefited the United States, as well as Canada and many other countries. We believe that Canadian influence ought to be deployed as persuasively as possible so as to maintain an outward-looking posture on the part of our large neighbour. But if the United States were ever to adopt significantly more protective measures adversely affecting the Canadian economy, we believe that it would be essential for Canada, in its own interests, to press for special exemption on the basis of the high degree of economic interdependence between the two countries. This would be analogous to the exemption sought by Canada when the United States imposed controls on capital exports in the 1960's.

### *Canadian Tariff Structure*

Canadian tariff policy will be particularly important if Canada does not become part of a larger industrial market. Changes in technology and other factors can make tariff provisions obsolete, or produce results not intended by tariff-makers years before. Canada revised and overhauled extensive sections of the tariff at the time of the Kennedy Round. Tariffs remain an important regulator of imports and of competitive conditions within the country, and it is only prudent to undertake more frequent and more comprehensive reviews aimed at promoting internal efficiency. The object of such reviews would be to evaluate alternatives in a dynamic world of low tariffs, of keen international competition under which unit costs of industrial inputs may be the crucial factor, and of the rapid growth of multinational firms which are swiftly coming to play a greater role in transferring goods, technology, and capital.

There is currently a great deal of pessimism about further GATT negotiations on the scale of the 1947 or 1967 agreements. In this context, however, two points must be borne in mind: that a similarly gloomy outlook existed in 1960 and proved to be inaccurate, and that it is essential to maintain some forward movement to minimize the risks of protectionist trade policies which would be highly damaging to the Canadian economy. Canada should therefore encourage and exploit any major new opportunities that may arise in the 1970's.

It has been suggested that free trade for selected industrial materials may be one appropriate goal for future GATT tariff negotiations.

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There are two main problems involved in this approach. The first is to get agreement on the commodity groups to be negotiated, since export interests of the GATT countries vary widely. The second is that free trade only in products that are industrial inputs, while maintaining existing levels of protection for related final products, could increase effective protection and might foster inefficient production of more highly manufactured products. There seem, however, to be good reasons for exploring this approach for all it is worth, if these considerations are kept in view and carefully weighed.

Although economic analysis has frequently indicated that a national economy might derive general economic benefits from unilateral tariff reductions, no major country's commercial policy has been based upon this concept since the heyday of the British industrial revolution in the nineteenth century. However, several countries have used such reductions in a limited and selective way over the past decade to counter inflation. Canada, in 1969, unilaterally accelerated implementation of the Kennedy Round tariff reductions for this reason. If persistent and unacceptably high increases in industrial costs and prices occur in the 1970's, we believe that an appropriate use of unilateral tariff reductions should be considered as a potentially useful instrument in a well-balanced armoury of anti-inflation weapons, providing that these are not used in punitive ways for such purposes.

### *The Multinational Firm*

A feature of industrial organization and trade among advanced countries is the emergence of more and larger firms that have manufacturing operations, frequently on a specialized and integrated basis, in several countries. In general, such firms have significant competitive advantages arising from their ability to combine large amounts of capital, competent management, skilled professionals and advanced technology, and to move these to economic locations for production. In a word, they are competitive and flexible organizers of economic resources. The potential impact of this form of private economic organization has been described as follows:

"... in 20 years, the internationally owned sector could easily equal the size of the U.S. Gross National Product or that of the Rest of the Free World, accounting for half of Free World GNP compared with about 15 per cent currently."<sup>1</sup>

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<sup>1</sup>J. N. Behrman, *An Essay on Some Critical Aspects of the International Corporation—a Background Study to the Interim Report on Competition Policy of the Economic Council of Canada—Ottawa, January 1970, mimeo, p. 7.*

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Thus the rising importance of the international firm, with its potential for contributing to efficiency, is a major new factor bearing on commercial policy decisions. Two important problems are posed: how to foster more effective Canadian-based participation in the rapid growth and development of multinational corporations, and how to make the capabilities and potentials of such firms best serve Canadian economic goals when their future development and even their present activities can perhaps be readily shifted elsewhere.

We must not, however, forget the important role that other types of firms must play in Canada's economic progress. Among these, relatively small domestic firms have frequently proved themselves to be highly capable of vigorous, competitive innovation, and of contributing to the economy in ways that enhance its growth and technical capability.

In summary, we discern three broad *alternative* paths along which world commercial policy could develop:

1. *A continued, gradual reduction of trade barriers such as occurred between 1947 and 1967.* Such "gradualism" implies fairly moderate, but important, adjustments in response to the enlargement of the EEC, as well as steps to contain nontariff distortions of industrial trade and to obtain better trade conditions for farm products. Steps such as these represent virtually *a minimum condition* for the long-term, healthy development of Canada's international trade. Even so, they will not occur automatically, but will require vigorous participation by Canada in international negotiations, including willingness to provide meaningful reductions in barriers to imports in return for better conditions for exports.

2. *A positive and constructive response by the United States and the EEC to the issues raised by the creation of a huge trading bloc in Western Europe.* It is in Canada's interest to do what we can to promote such a response, and to participate wholeheartedly in negotiations analogous to the Kennedy Round. This would imply willingness to reduce substantially barriers to imports, in line with the scale of opportunities that would be provided through foreign reductions of trade barriers for restructuring and rationalizing Canadian industry and increasing its long-term viability and productivity.

3. *A possible turn towards protectionist trade policies on the part of the United States and/or the EEC.* As already indicated, protectionism in the United States could have a particularly severe impact on some parts of Canada's economy. There are strong forces in all

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the big countries favouring the maintenance and expansion of an open world economy, and Canada must use its influence constructively in support of this economically enlightened viewpoint. If protectionist policies were adopted, however, it would be essential for Canada to preserve as much access as possible to foreign markets, especially for manufactured products. This would imply special accommodations primarily with the United States.

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## STATISTICAL APPENDIX



TABLE A-1  
CONTRIBUTIONS TO GROWTH OF REAL OUTPUT, 1946-67

	Agriculture, forestry, fishing	Mining, oil and gas	Manufacturing	Construction	Utilities	Transportation, storage, communication	Trade	Finance, insurance, real estate	Community, business and personal services	Public administration	Nonagricultural goods	All services	Total economy
Real Domestic Product...	1.74	8.34	4.98	6.00	8.89	4.62	4.47	3.83	4.15	3.77	5.49	4.22	4.61
	(Trend rates, per cent per year)												
	Percentage Points												
Contribution of:													
Total factor input.....	-1.71	6.04	2.95	3.72	6.35	1.83	3.34	5.39	5.15	3.01	3.43	3.50	2.36
Labour input.....	-2.53	.81	1.37	2.97	1.63	.92	2.01	2.18	3.74	2.26	1.45	2.39	1.24
Employment.....	-2.50	.69	1.25	2.85	1.53	1.16	2.33	2.36	4.35	2.64	1.34	2.85	1.51
Education.....	.16	.20	.20	.18	.15	.22	.15	.15	.30	.15	.19	.24	.30
Age-sex composition	.08	.04	.16	.12	.09	.15	.20	.12	.31	.11	.15	.22	.06
Hours of work.....	-.27	-.08	-.24	-.18	-.14	-.61	-.27	-.21	-.60	-.64	-.24	-.48	-.49
Capital input.....	.82	5.23	1.58	.74	4.73	.91	1.32	3.21	1.41	.75	1.98	1.11	1.12
Machinery and equipment.....	.60	1.53	1.08	.66	1.13	.46	.70	.61	.32	.03	.93	.29	.37
Construction.....	.22	3.70	.50	.08	3.60	.45	.62	2.60	1.09	.72	1.05	.82	.75
Factor productivity....	3.45	2.30	2.03	2.28	2.54	2.79	1.13	-1.56	-1.00	.76	2.06	.72	2.25

Note: Capital stock excludes residential sector.

Sources: Wolfgang M. Illing, *Sources of Growth in Canadian Industries, 1946-68*, Economic Council of Canada Staff Study No. 29, Ottawa, Queen's Printer, forthcoming.

TABLE A-2  
PERCENTAGE DISTRIBUTION OF OUTPUT, EMPLOYMENT, AND CAPITAL STOCK

	Output (Value)		Output <sup>1</sup> (Volume)		Employment		Gross Capital Stock <sup>2</sup>	
	1946	1967	1946	1967	1946	1967	1946	1967
Agriculture, forestry, fishing.....	15.4	5.1	10.4	5.5	27.8	9.0	10.0	8.1
Mining, oil and gas.....	3.4	3.9	2.2	4.5	1.6	1.5	2.6	6.0
Manufacturing.....	26.2	24.9	23.9	27.0	24.6	23.8	19.6	18.8
Construction.....	4.1	6.5	4.0	6.0	4.5	6.4	0.8	1.2
Utilities.....	2.1	2.7	1.4	3.3	0.7	1.1	7.0	11.5
Transportation, storage, communication.....	9.9	8.9	10.0	10.4	8.2	7.9	24.5	16.4
Trade.....	12.9	12.4	12.7	12.4	13.3	16.6	4.3	5.0
Finance, insurance, real estate.....	7.8	11.4	10.7	10.9	2.7	4.2	1.9	2.8
Community, business and personal services.....	9.9	17.1	14.9	13.8	11.9	23.5	7.8	10.9
Public administration.....	8.3	7.2	10.0	6.5	4.8	6.0	21.4	19.3
Nonagricultural goods industries.....	39.1	39.2	33.5	42.1	33.7	34.3	30.9	38.3
All goods industries.....	51.3	43.1	41.7	46.2	59.2	41.8	40.1	45.5
All service industries.....	48.7	56.9	58.3	53.8	40.8	58.2	59.9	54.5
Total economy.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

<sup>1</sup>Based on data in 1961 dollars.

<sup>2</sup>Based on 1961 prices. Excludes residential structures.

SOURCE: Based on data from Dominion Bureau of Statistics, adjusted to 1960 Standard Industrial Classification.

TABLE A-3  
REAL OUTPUT, INPUTS AND PRODUCTIVITY IN MANUFACTURING INDUSTRIES, 1947-56

Industry <sup>a</sup>	Real Output (1)	Labour Input <sup>b</sup> (2)	Capital Input <sup>c</sup> (3)	Combined Labour and Capital Inputs <sup>d</sup> (4)		Labour Productivity (1)-(2)	Factor Productivity (1)-(4)
				(Per cent per year)			
Total Manufacturing.....	5.5	1.6	5.3	2.8		3.9	2.7
Food and beverages.....	3.6	1.0	5.2	2.6		2.6	1.0
Tobacco products.....	5.6	-1.2	5.8	1.5		6.8	4.1
Rubber products.....	2.4	-0.7	3.8	0.3		3.1	2.1
Leather products.....	0.7	-1.9	0.7	-1.4		2.6	2.1
Textiles.....	3.2	-1.2	3.2	0.2		4.4	3.0
Clothing.....	3.3	0.2	1.9	0.6		3.1	2.7
Wood products.....	4.3	0.8	3.0	1.4		3.5	2.9
Pulp and paper products.....	4.9	1.1	5.9	3.3		3.8	1.6
Printing and publishing.....	7.3	2.3	4.2	2.8		5.0	4.5
Iron and steel.....	5.7	1.2	5.5	2.5		4.5	3.2
Transportation equipment.....	5.9	3.2	3.5	3.3		2.7	2.6
Nonferrous metals.....	4.7	3.2	3.9	3.5		1.5	1.2
Electrical products.....	9.2	5.2	6.2	5.5		4.0	3.7
Nonmetallic mineral products.....	9.2	3.5	10.2	6.4		5.7	2.8
Petroleum and coal products.....	12.1	3.9	9.8	7.2		8.2	4.9
Chemicals and products.....	8.7	2.8	8.3	5.3		5.9	3.4
Miscellaneous manufacturing.....	10.5	2.4	3.3	2.7		8.1	7.8

<sup>a</sup>1948 Standard Industrial Classification data.

<sup>b</sup>Man-hours.

<sup>c</sup>Average of gross and net fixed capital stock data.

<sup>d</sup>Calculated on the basis of shares of labour and capital in Gross Domestic Product at factor cost in these industries, on the basis of the DBS 1949 input-output table.

Source: Based on data from Dominion Bureau of Statistics and estimates by Economic Council of Canada.



TABLE A-4  
REAL OUTPUT, INPUTS AND PRODUCTIVITY IN MANUFACTURING INDUSTRIES, 1957-67

Industry <sup>a</sup>	Real Output (1)	Labour Input <sup>b</sup> (2)	Capital Input <sup>c</sup> (3)	Combined Labour and Capital Inputs <sup>d</sup> (4)	Productivity	
					(1)-(2)	(1)-(4)
					(Per cent per year)	
Total Manufacturing.....	5.4	1.6	4.6	2.5	3.8	2.9
Food and beverages.....	4.6	0.9	4.7	2.2	3.7	2.4
Tobacco products.....	4.4	-1.0	6.4	2.0	5.4	2.4
Rubber products.....	3.6	1.2	3.4	1.9	2.4	1.7
Leather products.....	1.6	-0.4	0.7	-0.4	2.0	2.0
Textiles.....	6.9	0.9	2.3	1.3	6.0	5.6
Knitting mills.....	5.6	-0.4	1.0	-0.2	6.0	5.8
Clothing.....	2.7	0.6	0.0	0.6	2.1	2.1
Wood products.....	4.3	0.6	3.6	1.2	3.7	3.1
Furniture and fixtures.....	5.8	2.0	4.4	2.4	3.8	3.4
Pulp and paper products.....	3.9	1.6	5.4	3.4	2.3	0.5
Printing and publishing.....	4.0	1.3	4.1	2.0	2.7	2.0
Primary metals.....	4.7	1.4	5.1	2.7	3.3	2.0
Metal fabricating.....	4.9	1.9	3.6	2.3	3.0	2.6
Machinery.....	8.0	3.1	4.8	3.6	4.9	4.4
Transportation equipment.....	6.1	1.9	5.5	2.7	4.2	3.4
Electrical products.....	7.6	2.3	3.7	2.8	5.1	4.8
Nonmetallic mineral products.....	4.4	1.9	4.6	2.8	2.5	1.6
Petroleum and coal products.....	5.2	-0.1	3.6	2.4	5.3	2.8
Chemicals and products.....	6.7	1.6	6.1	3.6	5.1	3.1
Miscellaneous manufacturing.....	7.2	3.8	7.0	4.7	3.4	2.5

<sup>a</sup>1960 Standard Industrial Classification data.

<sup>b</sup>Man-hours.

<sup>c</sup>Average of gross and net fixed capital stock data.

<sup>d</sup>Calculated on the basis of shares of labour and capital in Gross Domestic Product at factor cost in these industries, on the basis of the DBS 1961 input-output table.

SOURCE: Based on data from Dominion Bureau of Statistics and estimates by Economic Council of Canada.

TABLE A-5

CANADA-UNITED STATES RATIOS OF OUTPUT, INPUTS AND  
PRODUCTIVITY FOR SELECTED MANUFACTURING INDUSTRIES, 1963<sup>1</sup>

	Volume of Gross Output	Inputs			Gross Output per Unit of:		
		Labour	Capital	Materials and Fuels	Labour and Capital	Labour, Capital, Materials and Fuels	
(Canada as percentage of United States)							
Slaughtering and meat packing.....	7.9	12.2	14.2	8.6	65	61	85
Dairy products.....	10.5	12.6	11.8	11.9	83	86	88
Confectionery.....	8.0	12.9	14.4	7.6	62	58	81
Rubber industries.....	7.1	8.6	13.5	7.4	83	66	81
Wool yarn mills.....	5.5	12.6	10.5	6.8	44	47	67
Sawmills.....	27.8	23.8	27.1	21.6	117	110	121
Veneer and plywood.....	14.2	19.6	18.5	11.9	72	74	98
Pulp and paper.....	23.5	29.4	28.0	23.5	80	82	91
Other paper converters.....	5.8	8.6	8.4	5.9	68	68	85
Iron and steel.....	5.6	6.6	4.9	4.5	85	99	111
Petroleum refining.....	7.9	8.2	15.7	8.8	96	58	83

<sup>1</sup>Calculations are based on Canadian weights.Source: United States and Canadian 1963 Census of Manufactures and estimates by Economic Council of Canada. Gross capital stock estimates derived from *Source Book Statistics of Income* for the United States and *Taxation Statistics* for Canada.

TABLE A-6  
HEALTH CARE EXPENDITURES,<sup>1</sup> CANADA AND UNITED STATES<sup>2</sup>  
1955 AND 1967, WITH PROJECTIONS TO 1975

	1955	1967	1975	Percentage Increase		Average Annual Percentage Change	
				1955-67	1967-75	1955-67	1967-75
<i>Canada</i>							
Total expenditures (millions of dollars) . . .	953	3,429	8,000	260	133	11.3	11.2
Total expenditures per capita (dollars) . . .	61	168	344	175	105	8.8	9.5
Total expenditures per capita (in constant 1967 dollars) . . . . .	96	168	256	75	52	4.8	5.4
<i>United States</i>							
Total expenditures (millions of dollars) . . .	17,315	48,929	94,000 <sup>3</sup>	183	92	9.0	8.5
Total expenditures per capita (dollars) . . .	103	242	428	135	77	7.4	7.4
Total expenditures per capita (in constant 1967 dollars) . . . . .	159	242	331	52	37	3.6	4.0

<sup>1</sup>Excluding capital expenditures.

<sup>2</sup>United States figures are believed to be slightly more comprehensive than those for Canada, since the U.S. data include such categories as expenditures on patent medicines and nursing-home care. The figures for Canada may therefore be understated, by comparison, by about 10 per cent.

<sup>3</sup>This would appear to be a rather conservative figure. Actual expenditures in 1969 apparently increased to about \$15 billion above 1967.

Source: Canada: *The Canada Year Book*; and estimates by Economic Council of Canada. United States: Estimates based on Dorothy P. Rice and Barbara S. Cooper, "National Health Expenditures, 1950-1966", and "National Health Expenditures, 1950-1967", *Social Security Bulletin*, April 1968 and January 1969, respectively; *Report of the National Advisory Commission on Health Manpower*, vols. I and II; and estimates by Economic Council of Canada. U.S. population for 1955 and 1967 from Annual Reports of the Council of Economic Advisers; 1975 estimate from Bureau of Census "Population Estimates", Series P. 25, no. 381, December 1967.

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