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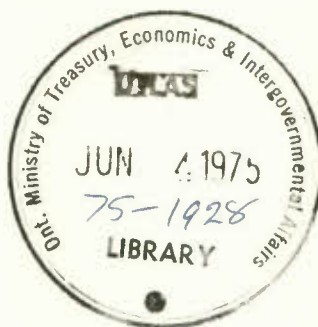


Eleventh Annual Review

**Economic Targets and  
Social Indicators**

## ECONOMIC TARGETS AND SOCIAL INDICATORS

Due



ECONOMIC COUNCIL OF CANADA

**Eleventh Annual Review**

**Economic Targets and  
Social Indicators**

1974

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## *Introduction*

A major duty assigned to the Economic Council of Canada under the Act establishing it is the regular assessment of medium- and long-term economic prospects in relation to the growth potential of the Canadian economy. The Council complied with this requirement from 1964 until 1969 by devoting a chapter of its Annual Reviews to economic performance. In 1970 and 1971, special reports assessed and analysed achievements in the Canadian economy. Since 1972, the analysis of performance has been the only subject of the Annual Review.<sup>1</sup> The *Eleventh Annual Review* continues this analysis, taking into consideration recent worldwide inflationary pressures and the implications of the world energy situation.

The Economic Council, in its last two Reviews, put forward an approach to medium-term economic decision-making that could be summed up in the four words: *target, assessment, recommendation, and concertation*. The *targets* proposed were a set of fifteen quantitative medium-term economic performance objectives against which the Council undertakes its regular *assessment* of Canadian economic developments and prospects. Among the Council's *recommendations* was the adoption of a set of performance targets for the period three years ahead and of certain measures designed to secure an improved degree of *concertation* in Canadian economic policies.

Such proposals included the convening of an annual National Economic Conference to facilitate an exchange of views within the private sector on future prospects and possibilities; the establishment, by the federal and provincial governments, of one or more indicators of the desired level of increase in public expenditures in each future three-year period; and an annual parliamentary review of Canada's economic situation in the light of quantitative estimates of achievable medium-term economic performance.

<sup>1</sup> Studies on special subjects are now released without a predetermined timetable. A report on cyclical instability in the construction industry was released on July 18, 1974. See Economic Council of Canada, *Toward More Stable Growth in Construction* (Ottawa: Information Canada, 1974). The preparation of the Annual Review of the Council is the responsibility of the Performance Research Group.



## 2 Introduction

The first National Economic Conference was held on December 13 and 14, 1973.<sup>2</sup> This Conference was exploratory, and spectacular progress was neither anticipated nor achieved. It did, however, yield some important results. The prior organization of the sixteen industry committees permitted representatives of those industries to explore in depth the major issues and problems confronting them, and the Conference itself provided an opportunity to evaluate the elements of consensus emerging from their work.

Perhaps the single most important theme to come out of the Conference was the widespread uncertainty that exists in the private sector about the future environment for private enterprise and the future role of governments. It was apparent that this concern took precedence over the problem of establishing the feasible medium-term performance of the economy, to which the Council had primarily addressed itself. The Conference also reinforced the Council's recommendation that governments establish a clear conception of their own medium- and longer-term needs and priorities, both to facilitate their own planning and to reduce the degree of uncertainty underlying key decisions that need to be made now in the private sector, in such areas as energy, mining, transportation, and agriculture.

In its preparation for the second National Economic Conference, to be held in December 1974, the Council has endeavoured to encourage an exchange of technical information between its staff and the Conference committees. It is hoped that, as a result, not only will the Conference discussions proceed on the basis of broadly shared views about future developments in the Canadian economy, but the Conference will also be able to devote a major porportion of its time to discussing substantive issues. Increased participation by labour representatives on the committees and at the Conference, and broader representation of other interested groups, has been sought this year in response to suggestions made during the first Conference. The Economic Council, as sponsor of the Conference, cordially invites all participants in this year's meetings to take advantage of the unique opportunity it affords to discuss economic issues, difficulties, and opportunities in a constructive and co-operative milieu. The Council wishes to record its deep appreciation of the time and effort devoted by both the committee chairmen and members and the Conference participants to making the National Economic Conference a significant and useful Canadian institution.

2 For a report on the proceedings and a view of the papers prepared in advance by the staff of the Economic Council and the Conference committees, see *The Outlook from 1973* and *Papers of the National Economic Conference, 1973* (Ottawa: Information Canada, 1974).



At the federal-provincial meeting of Ministers of Finance on January 24 and 25 of this year, the ministers moved towards acceptance of the Council's recommendation to establish indicators of future government expenditure by referring the matter for study to a standing committee of officials, in consultation with the Chairman of the Economic Council. This represents, in our view, a significant and gratifying first step. The Council hopes that the ministers will, as a result, find themselves in a position in which they can endorse and give effect to the full recommendation. We wish to stress once again the importance of seeking better co-ordination of federal and provincial financial policies as an effective means of reducing uncertainties while moving towards attainment of national economic objectives.

While there has been little response in Parliament to the Council's recommendation to establish an appropriate parliamentary setting in which to discuss and assess Canada's medium-term economic priorities and prospects, we understand that the major difficulty lies in the competition for time that already exists in Parliament and in the very heavy workloads that the Members of Parliament have to shoulder rather than in any fundamental disagreement with the Council's proposal. To provide for the additional task we have proposed, certain existing rules and procedures would possibly have to be altered and consideration of other important issues sacrificed.

In these circumstances, it is, of course, for Members of Parliament to determine the issues they wish to consider. We merely reiterate our belief that an annual assessment such as we have proposed would contribute in a major way to improved evaluation of Canada's economic stabilization policies and provide broad guidelines for the preparation of the Budget. It would also assist Members of Parliament to assess the economic effects of the financial measures proposed by the Government and contribute to raising the standard of public discussion of economic matters.

While the Council continues to promote the co-ordination of economic policy-making and its objective of developing, revising, and updating the economic performance indicators, it is also devoted to the extension of the indicator framework. This year, a general approach to social indicators is outlined and some measures are proposed in the areas of housing, health, and the environment. This Review also reflects the Council's continuing interest in major economic issues, and chapters are devoted to discussions of energy, prices, trade, and industry prospects.

The *Eleventh Annual Review* is divided into two parts. The first presents the Council's approach to, and analysis of, economic events within the framework of the performance indicators introduced in its *Ninth Annual Review*. Chapter 1 discusses the characteristics of, and the proposed extensions to, the indicator framework. Chapter 2 contains an analysis and appraisal of recent economic performance in light of the interim objectives

#### 4 Introduction

proposed in last year's Review. Chapter 3 presents our general conclusions and recommendations. It also contains a new set of indicators relating to the years 1973 to 1977. These three chapters constitute Part 1 of the Review.

Part 2 contains five chapters that provide supporting analysis for a range of important topics. Chapter 4 contains specific proposals for particular social indicators following the general approach to the development of these indicators presented in Chapter 1. Chapter 5 outlines some economic implications of future energy developments. Chapter 6 discusses the world economic outlook as the context within which the performance objectives for 1973-77 have been established. Chapter 7 discusses future price prospects and a number of related issues. Finally, Chapter 8 sets out some of the prospects and problems confronting individual industries over both the future three-year period covered by the performance objectives and the longer term to 1982.

There are also three appendixes. Appendix A discusses in more detail the social indicators presented in Chapter 4. Appendix B contains the tentative results of simulations to 1982 of the impact on the Canadian economy of the three energy scenarios discussed in Chapter 5. Appendix C presents data on Canadian trade.

## **PART 1**

## *Extending the Indicator Framework*

In the *Eighth Annual Review*, the Council recommended "the development of a comprehensive set of statistical measures to monitor the changing conditions of our society over a broad spectrum of concerns." The measures most frequently used to gauge the state of our society have been generally economic in nature, such as growth, real output per person employed, and price indexes. But, while unquestionably essential, they do not fully or adequately reflect many of the major dimensions of the social system. As was noted in this earlier Review, "the concerns of our society have greatly broadened in recent years. Economic growth and stabilization are still important, but...a variety of other issues have come to demand increasing attention."<sup>1</sup>

To take account of these other concerns, there is a need for a broader framework within which it should be possible to say something concrete, from the viewpoint of overall well-being, about the ultimate ends of the socio-economic activity of the nation, the means to achieve these ends, and the degree to which they are being achieved.<sup>2</sup> Ideally, one would like to be able to treat the social system in an integrated way. However, the capacity to do this implies the existence of an overall model or theory of the social system. In fact, although there are a number of approaches to conceptualizing a general social system theory, none of these has yet been developed to a level that would permit a simultaneous comprehensive examination of the impact of particular activities on all facets of the social system.<sup>3</sup> Such a model – which would make possible a form of "social accounting" – cannot even be said to be on the horizon, in any practical sense.

This lack of such an operational theory of the social system necessitates an alternative approach to a more extensive examination of the nation's

1 Economic Council of Canada, *Eighth Annual Review: Design for Decision-Making* (Ottawa: Information Canada, 1971), pp. 70-71.

2 The term "socio-economic," as employed here, refers to the combined social, political, economic, environmental, and technological aspects of society.

3 See, for example, T. Parsons; E. Shils; K. D. Naegle; and J. R. Pitts (eds.), *Theories of Society*, vols. 1 and 2 (New York: Free Press of Glencoe, 1961).

socio-economic activity. The outlines of one such possible approach are sketched in this chapter and, in Chapter 4, we present "first approximations" of some principal social indicators for a few areas.<sup>4</sup> Although the bulk of the material in this Review is economically oriented, the presentation of this work on the development of social indicators emphasizes, in practical terms, our belief in the necessity of adopting a wider perspective.

The broader conceptual approach we have employed to look at the social system involves, first, a delineation of society's basic goals and the division of the system into areas of social concern. These areas may then be considered individually, each within the context of its own ends and objectives, for the purposes of gaining a better understanding of their internal processes and of developing indicators that measure the state of, and changes in, these areas. Even though, in practice, the indicators for the economically oriented areas are more interrelated and advanced in their development than those for the socially oriented areas – and thus are discussed separately here – in principle, both the economic and social indicators are part of the same basic continuum of measures of the social system.<sup>5</sup>

### SOCIETY'S BASIC GOALS

Each individual has certain needs, and these range from the most fundamental, such as survival, to the more complex psychological ones, such as self-realization. These needs are really the *basic goals* of individuals.<sup>6</sup> From the point of view of society, these can be restated in terms of two basic goals – *well-being* and *equity*. All subsidiary objectives contribute to the attainment of these basic goals.

The degree of well-being is determined by the extent to which the material, socio-cultural, psychological, and other needs of society are met. Equity, on the other hand, is an appropriate distribution of well-being among members of society. There are several views about what constitutes equity and how it might best be achieved. Among these, *equality*

4 See also D. W. Henderson, *Social Indicators: A Rationale and Research Framework*, Economic Council of Canada (Ottawa: Information Canada, 1974). This study presents the essence of this approach in more detail.

5 Although these indicators are all socio-economic in nature, the terms "economic indicator" and "social indicator" have received wide currency and are useful in distinguishing their general orientation.

6 There are several other terms that should be clarified. *Goals*, as noted in the *Eighth Annual Review*, are considered to be general aspirations upon which a large degree of consensus can often be reached, such as with respect to health or justice. *Targets* or *objectives* refer in more specific terms to what is hoped will be achieved at some point in the future. *Indicators*, as noted above, are a means of measuring (or "indicating") the state of, or changes in, a particular area. An indicator might reasonably have a target associated with it and be used to measure progress towards that target, but it is not, in itself, a target.



*of opportunity* has probably been, in principle, the most widely accepted approach to equity. This approach attempts to provide everyone with the same opportunity of access to well-being. Another view of equity, *equality of results*, has also come to receive a certain amount of attention.

These two goals are too general to provide specific guidelines for the formulation of policies. For this, more detailed divisions of the social system and their objectives must be defined. Nonetheless, these basic goals do provide the skeletal outlines of a broader framework for viewing the ultimate ends of society's activities.

### THE MAJOR AREAS OF CONCERN

Since the absence of an operational social system theory precludes treating all socio-economic activities in an integrated fashion, this suggests the need to subdivide the social system into areas that can be dealt with more readily in terms of our present understanding. This, of course, can be done in several ways. However, there are good reasons for doing so in such a way that the division conforms reasonably well to institutional realities; for example, it would permit better correspondence between the areas and on-going policy formulation. A recent revision of the set of *areas of concern* put forward tentatively in the *Eighth Annual Review* resulted in the designation of nine major areas that cover most socio-economic concerns, each of which includes a number of components:<sup>7</sup>

- 1 individual rights and responsibilities (legal rights, including security of life and property; and participation in public decision-making);
- 2 social rights and national identity (domestic social rights, including the protection of group rights; and international relations, including defence);
- 3 health (positive health, morbidity, and mortality);
- 4 command over knowledge and skills (basic and higher education, other training, artistic creativity, research and development, and information networks);
- 5 the natural environment (air, water, and soil);
- 6 the man-made environment (social, including leisure; and physical, both rural and urban, the latter including housing, land use, and transportation);

<sup>7</sup> Henderson, *Social Indicators*, Chart 1, p. 27. In this chart, most of the components shown in parentheses are further disaggregated. In the *Eighth Annual Review*, "areas of concern" were referred to as "goal areas."

## 10 Extending the Indicator Framework

- 7 employment (market for labour, labour-management relations, job security and satisfaction, and occupational mobility);
- 8 the production and consumption of final goods and services; and
- 9 financial status (income and assets).

The last three areas listed above are economically oriented in the traditional sense, while the others – in which market forces generally play a lesser role and government plays a larger role – are more socially oriented. Although this distinction serves certain practical purposes, it is not intended as, and cannot be considered, a precise one. For example, unemployment is a factor of major economic importance, but it may have many harsh social consequences associated with it. Health, on the other hand, has a strong social orientation; at the same time, however, the objectives of this area and the means to attain them have considerable economic implications. It is this overlap between the various areas that leads us to regard them, in a broad conceptual sense, simply as different facets of the same general socio-economic system.

It has been possible to learn something concrete about the internal processes involved in some of these areas. Besides the considerable and growing knowledge that exists of the economically oriented areas, some progress has also been made in the understanding of certain other areas, such as education. However, much remains to be learned.

A certain level of understanding also exists about the way in which some of these areas – such as the economically oriented ones – interact among themselves. However, very little is known about how they interact within the total socio-economic system. A systematic understanding of the interactions among all areas – necessarily within the context of a general social system theory – will not come soon or easily. As a result, in treating the socially oriented areas individually, external factors can be introduced into the analysis only in those cases in which the interactions are clear. Thus a number of important interactions may be missed. However, as an understanding of the various subsystems of society increases, so will the ability to detect and take into account these interactions.

### ECONOMIC INDICATORS AND OBJECTIVES

It will now be clear that the economic indicator framework underlying the interim performance objectives set out in the *Ninth* and *Tenth Annual Reviews* fits into, and constitutes part of, the more comprehensive framework of socio-economic indicators initially proposed in the *Eighth Annual Review*.

Objectives in the economic area are generally defined in relation to growth, stabilization, and the distribution of income and wealth, which in

turn are intended to contribute to the two basic goals, well-being and equity. The fifteen "performance indicator" values proposed in the Council's *Ninth* and *Tenth Annual Reviews* are a set of medium-term *economic performance objectives* for a given future time period.<sup>8</sup> We refer to them as a set because they form a consistent interrelated array of values. Within this particular set, three of the performance objectives – real output per person employed, relative prices, and the unemployment rate – are taken to be genuine economic targets for the relevant medium-term time period. Four others – total investment; investment in machinery and equipment and in nonresidential construction; housing construction; and government expenditures – are what we presently regard as instruments that have a strong influence on productivity growth and provide the necessary link between stabilization and longer-term objectives. The remaining performance objectives in the set have values consistent with the above targets and instruments.

The development of the economic indicator framework has been very much an evolutionary process. At present, the objectives cover the period three years ahead and describe the main dimensions that the economy can assume while moving towards a more distant future, their purpose being to serve as a guide to stabilization policy in the public sector and as an input to the decision-making process in the private sector. However, the present performance objectives do not cover all matters of concern to decision-makers. The three-year horizon is relevant for stabilization purposes, but it is too short a time period for decisions being made on many other matters such as investment or market development. Extension of the framework to include a longer time period than that presently covered would, however, be premature, as the system is still in the development stage. As a limited and provisional alternative, we propose later in this Review to explore the long-term impact of various assumptions in the energy area. An attempt is also made to relate these overall perspectives to industry output, employment, and capital stock.

We turn our attention now from economic indicators and objectives to social indicators. Although the discussion in the following section is directed largely to the socially oriented areas, what is said applies, in principle, to *all* areas of concern.

8 The term "performance indicator" was used as a comprehensive expression connoting any of three concepts: the first is the way in which a factor of importance within a given area is measured (e.g., growth is measured by the rate of change in GNP); the second refers to the actual past and present values of the indicator; and the third refers to the values determined for this measure at specific points and intervals in the future (the performance objectives), assuming a particular set of conditions. See *Ninth Annual Review: The Years to 1980* and *Tenth Annual Review: Shaping the Expansion* (Ottawa: Information Canada, 1972 and 1973, respectively).



### THE DEVELOPMENT OF SOCIAL INDICATORS

In this section, a basic conceptual approach to the development of social indicators is outlined. For a particular area of social concern, the first step is to select the outputs corresponding to the area's basic objectives. This task will be easier for some areas (such as health) than for others (such as individual rights and responsibilities), given our present level of knowledge, since the basic objectives associated with the former areas are comparatively straightforward. Once an area's outputs have been defined, the next step is to determine the factors (inputs) associated with changes or differences in these outputs. These outputs and inputs are referred to as the *social indicators* for the area. Thus, from a quantitative point of view, *social indicators are those variables that play an active role in a particular area of socio-economic concern.* To state it in other words, the development of social indicators involves the measurement and analysis of aspects of social welfare that enhance our understanding of a given area. The trends of, and changes in, the relevant outputs and inputs over time reflect the evolution that is taking place in this area.

An example should serve to set the above discussion in more concrete terms. Primary and secondary education, a subcategory of the major area "command over knowledge and skills" referred to earlier, is generally considered to produce four major outputs: personality development, and the development of cognitive, socialization, and psychomotor skills in the student.<sup>9</sup> Once these have been defined more specifically, determination of the inputs that have a significant influence on them is the next step. These outputs and inputs are the social indicators for education. The variables to be tested in this instance would include teacher characteristics (such as experience or level of education), school characteristics (such as class size and availability of certain facilities), peer group variables (such as the level and distribution of intelligence in a class), individual variables (such as the basic intelligence of a student), and home and community variables (such as the parents' occupations and levels of education). From a policy viewpoint, it is important to know what variables are associated with changes and differences in the outputs, since those in the first two groups (and, to some extent, the third group) are more amenable to policy actions than those in the last two.

Besides the *quantitative* social indicators discussed above, there exists another category of indicators that can be described as *qualitative* or *subjective* social indicators. These are measures of how individuals or groups view the state of, or changes in, various areas of concern and what the aspirations and expectations of these members of society are with

9 B. S. Bloom (ed.), *Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook I - Cognitive Domain* (New York: David McKay, 1956).

respect to the evolution of these areas; such measures can be derived from attitudinal surveys, psychological studies, and the like.

Besides showing how people feel about various aspects of the social system (which, in itself, is important), these measures aid in the normative interpretation of the quantitative indicators, suggesting whether the value, or a change in the value, of an indicator should be viewed as "good" or "bad". The values of quantitative indicators do not themselves possess an *intrinsic* normative character; they simply measure social conditions and changes. It is the judgments placed on them that render them normative.<sup>10</sup> In some cases, the appropriate judgments appear relatively obvious (for instance, good health is preferable to illness) but, in other cases, the appropriate judgments are less clear (for example, with respect to measures of the social environment). In the latter cases, subjective indicators can be of help in determining the public's attitudes and aspirations. They can also help to establish the appropriate trade-offs, from the public's viewpoint, between conflicting objectives. Our work, however, is basically quantitative in nature, and thus the indicators proposed in Chapter 4 treat areas for which normative judgments, at least with respect to the "right" direction of change, appear relatively uncontroversial.

Generally, there will be more than one measure of output for a given area, and each measure will treat a different facet or the same facet in a different way. In any systematic analysis, one would consider as many of its outputs and relevant inputs as could reasonably be done in order to obtain as complete a picture as possible. However, the broad outlines of the state of, and trends in, a particular area of concern will then prove difficult to grasp from this large number of measures. Therefore, it would be advantageous to have certain summary or *principal* social indicators (largely output-oriented) that would synthesize and represent the overall situation with respect to a given area, taking external interactions into account.

However, the present limited knowledge of the processes involved in the social system does not allow the development of such complete summary measures. Nonetheless, there is a need for interim proxies for principal indicators dealing with important facets of at least some of the more consequential areas, from both a public and decision-making viewpoint. These *first approximations* of the principal indicators should reflect, to a reasonable extent, the state and trends over time of these key aspects, since they are intended to fill the gap until the development of a better and more comprehensive set of measures becomes possible. Because they are first approximations, these measures are naturally subject to future redefinition and reorientation. Where and when it becomes feasible in

10 There are, of course, normative judgments of a broader nature implicit in the choice of particular areas for attention, and in the selection of outputs for these areas.

the future, targets will be associated with these indicators, although, because of the generally slower-changing nature of social phenomena, targets for these areas will tend to be set in a longer-term framework than are the present medium-term economic objectives.

We have undertaken some initial work on the development of such indicators for certain important areas of concern and have also attempted to determine, or put in perspective, some of the factors influencing these measures. The preliminary results of this work, presented in Chapter 4, relate to the areas of housing, health, and the natural environment. We feel that the feedback obtained from putting these indicators forward at this time should help to guide future work, both at the Council and elsewhere. While work is continuing on the development of these principal indicators, research is also being done at the Council on certain other areas of concern, following the basic methodology described earlier in this section.

To conclude, there are a number of purposes and benefits associated with the development of social indicators. First, they will lead to a better understanding of the socio-economic processes at work within the various areas, as well as the interactions between these areas. Second, besides monitoring basic trends in particular areas, these indicators will help trace progress towards specific policy objectives; as a consequence, the problem areas in society will be made more visible. Third, knowledge of the inputs associated with the outputs of a particular area will help suggest those factors that should most probably be treated by policy and program actions. Fourth, the development and dissemination of social indicators will give the public more information upon which to base its decisions and with which to provide more articulate and meaningful feedback to decision-makers about the effects of various programs and policies. In essence, by broadening the framework for viewing the spectrum of socio-economic activities, we are really attempting to extend the understanding of what constitutes and affects the "quality of life" in our society.

## 2

### *An Appraisal of Canadian Economic Performance*

Despite the recent widespread economic turmoil, the economy in 1973 again performed, in terms of overall growth of demand and output, broadly in line with the Council's expectations. Again, however, price increases were larger, productivity increases smaller, and the growth in the labour force and employment substantially greater than we had anticipated. Among the components of overall demand, domestic demand – including imports, consumer durable spending, and residential construction – was stronger than we had allowed for, but this was offset by a lower-than-projected volume of exports.

The pattern of divergence between actual and expected economic performance suggests that the economy, under the impetus of exceptionally strong domestic demand, experienced physical constraints on the expansion of output. This took place at a time when the unemployment rate – the most commonly used indicator of economic slack – still indicated scope for significant further expansion. The phenomenon tends to confirm the conclusion reached in the *Tenth Annual Review* that significant changes have occurred in the degree of reliability of aggregate unemployment as an indicator of overall labour market tightness. The combination of stronger domestic demand, severer constraints on supply than the unemployment rate indicated, and the highly disappointing growth of productivity, added to the pressures of inflationary forces emanating from abroad and possibly prevented the full achievement of export opportunities. There is a need for a careful inquiry into why the growth of labour productivity has slowed down, for many personal and collective aspirations depend upon its continued improvement.

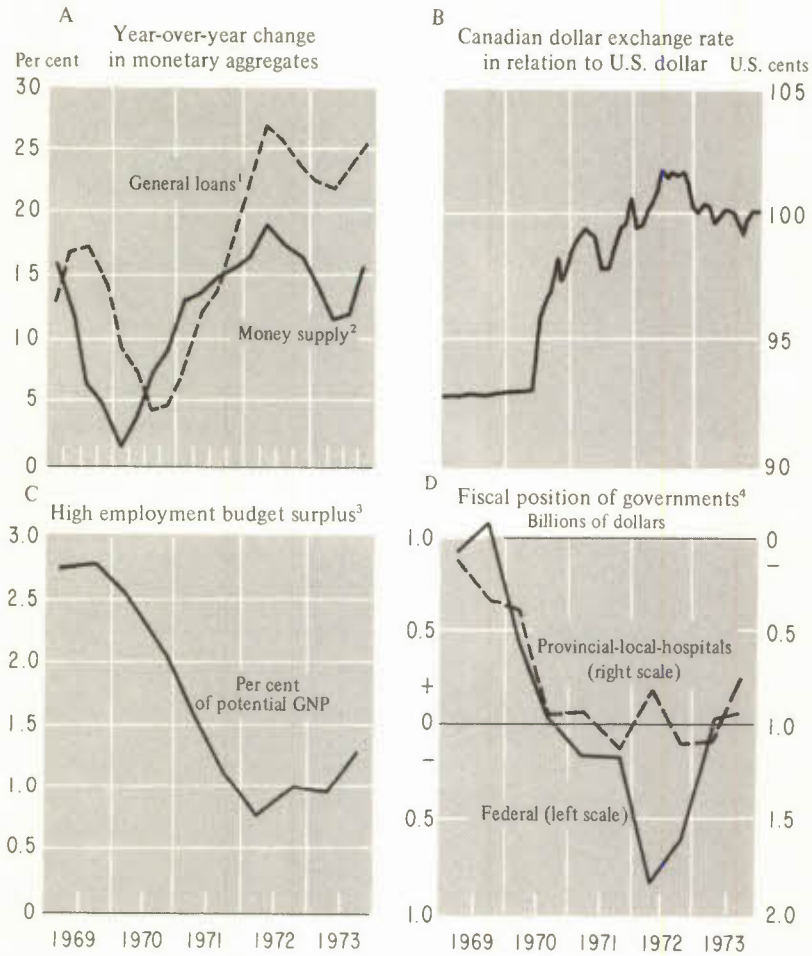
Against this summary background, we turn to a descriptive overview of recent developments in the Canadian economy. We then compare recent performance with the targets for Canadian medium-term performance proposed in our *Tenth Annual Review*.

#### REVIEW OF RECENT ECONOMIC DEVELOPMENTS

During 1973 the growth of demand and output accelerated in the major industrialized countries. The stimulative effects of this strength on the



**Chart 2-1**  
**Selected Indicators of Economic Policies, 1969-73**



- 1 "General loans" include personal loans and those to institutions, businesses, and farmers.
- 2 "Money supply" is defined as currency outside banks and Canadian-dollar chartered bank deposits held by the general public.
- 3 "High employment" is defined for this purpose as the level of employment associated with attainment of potential GNP. The high-employment budget position is calculated on a National Accounts basis and is derived from estimates of the revenues that would be realized at potential; expenditures are assumed to remain unchanged.
- 4 On a National Accounts basis.

**SOURCE** Based on data from Statistics Canada, Bank of Canada, and estimates by the Economic Council of Canada.

Canadian economy were reinforced by the impact of the 1972-73 devaluation of the North American currencies vis-à-vis those of the overseas industrial countries. Demand was further intensified by the expansionary domestic monetary and fiscal policies that were maintained for most of the year. The result was an exceptional increase in real output, an unprecedented rise in employment, and the elimination of most of the shortfall of realized output in relation to the economy's potential. But, as the year progressed, bottlenecks were encountered with increasing frequency; deliveries became slower; backlogs developed; selective labour shortages appeared; and the price of many goods and services surged rapidly upwards, following the more narrowly based inflationary increases recorded earlier for meat, vegetable, and wood products. Despite the strength in demand and the accompanying rise in employment, the aggregate unemployment rate remained relatively high. Canada has thus experienced strong output and employment growth, but yet deteriorating price performance and a disappointing reduction in aggregate unemployment.

Both monetary and fiscal policies during 1973 were conducive to sustaining the expansion that was actively stimulated in 1971 and 1972. On the monetary side, stated central bank actions were largely directed towards providing less stimulus to demand. The authorities attempted to moderate chartered bank lending activities, while avoiding any sharp deceleration in the rate of credit expansion. They also allowed the bank rate to increase in five consecutive steps, following a period of almost a year and a half of stability. Average growth of the supply of privately held money (Chart 2-1a) slowed down from the rates registered in the previous two years and, with loan demand showing little sign of abatement, expansion in chartered bank holdings of liquid assets was checked. As a result, the ratio of free liquid assets to major assets fell below the levels reached during the 1969 period of monetary restriction.

On the foreign exchange market, the Canadian dollar in 1973 continued to trade within a fairly narrow band, close to parity with the U.S. dollar (Chart 2-1b). However, it shared in the February 1973 devaluation of the U.S. dollar and its subsequent float against the European and Japanese currencies. For most of 1971 and 1972, a major purpose of monetary actions was to maintain low interest rate levels in Canada in relation to other countries in order to avoid large inflows of capital and prevent upward movement in the exchange rate, which would have threatened the competitive position of certain industries. During 1973, however, short-term interest rates rose substantially as a result of rapidly rising demand for funds under conditions of reduced availability of credit, although not to the extent encountered in the United States and abroad. The international differential in interest rates also appears to have been managed in such a way that, except for brief periods, both large

outflows and inflows of capital were avoided, thereby limiting movements in the external value of the Canadian dollar.

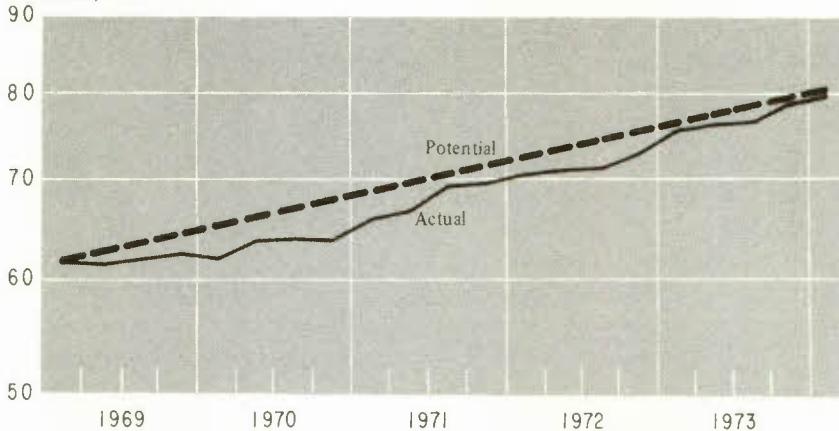
On the fiscal side, the degree of ease was reduced. The high-employment budget position of all levels of government, calculated on a National Accounts basis, built up to a surplus in excess of 1 per cent of potential GNP in the second half of 1973 (Chart 2-1c). Late in 1972, federal fiscal policy gradually moved away from its strongly expansionary position. Revenue accelerated, reflecting the overall strength of personal and corporate income, coupled with increasing inflation; and the rise in federal spending slowed appreciably, largely because of a lower rate of growth in transfer payments to persons following two years of exceptional increases. As a result, the net budgetary position of the federal government improved by about \$750 million. This occurred despite income tax concessions, increased personal exemptions, the abolition of various tariffs, and sales and excise taxes in the February 1973 Budget, and the improvement and indexation of major transfer programs in the course of the year. In contrast, provincial and municipal governments and hospitals recorded about the same overall deficit as in 1972 but, by year-end, the stance of policy, at this level as well, was clearly providing less stimulus to the economy (Chart 2-1d).

For the third consecutive year, the economy expanded faster than the potential rate, reducing to only a fraction the large GNP "gap" that emerged during the slowdown in 1970. The level of real output over the year averaged about 1.5 per cent below the potential ceiling, comparing favourably with gaps of 3.7 per cent in 1970, 3.5 per cent in 1971, and 3.0 per cent in 1972. The economy experienced constraints on its physical capacity by the first quarter of 1973, following the very strong spurt of expansion at the end of 1972 and in early 1973. After a pause in the second and third quarters, the pace of growth rose again in the closing months of the year, bringing the economy very close to full capacity once again (Chart 2-2). On an annual basis, the volume of GNP rose 6.8 per cent, up from a 5.8 per cent increase in 1972; this rise compares with a long-term potential rate of growth of about 5.0 to 5.5 per cent.

The economy in 1973 was characterized by strains on capacity but a relatively high rate of unemployment. Inadequate additions to productive capacity in recent years contributed to this. Outlays for plant and equipment have not increased significantly since the investment boom of the mid-sixties. Between 1966 and 1972, private fixed investment increased by an average of about 1.8 per cent per year, while growth in output averaged close to 5 per cent. The sharp acceleration in the growth of the Canadian economy in 1973 was achieved mainly through strong increases in employment growth. The rate of labour productivity rose at a rate well below the long-term average. In turn, the increased demand for labour tended to produce larger increases in participation rates than

**Chart 2-2**  
**Potential and Actual Gross National Product, 1969-73**

Billions of 1961 dollars  
 (ratio scale)



**NOTE** For the 1966-77 period, the estimate of potential growth is about 5.3 per cent, which is the rate implicit in data obtained from simulations of the CANDIDE model underlying the revisions to the performance indicators presented in Chapter 3 of the *Tenth Annual Review*. The rate was obtained by passing a smooth trend through the estimated levels of output associated in 1966 and 1977 with 3.8 per cent aggregate unemployment. This estimate of potential is thus a measure of the long-term growth rate of the economy under conditions of balanced growth over time of the labour force, the capital stock, and productivity. This definition of potential implicitly assumes that a 3.8 per cent aggregate unemployment rate is achievable without imposing excessive demands on labour markets, and that this rate represents the same degree of overall economic slack irrespective of time. Neither of these assumptions has been verified, and there are some grounds for believing that, for any given unemployment rate, there is less slack in the labour market today, and in the economy as a whole, than a decade ago. Consequently, such estimates of potential are approximations only.

**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

in the past (Chart 2-3), and the unemployment rate did not fall to the levels typically associated with periods of strain in the economy.

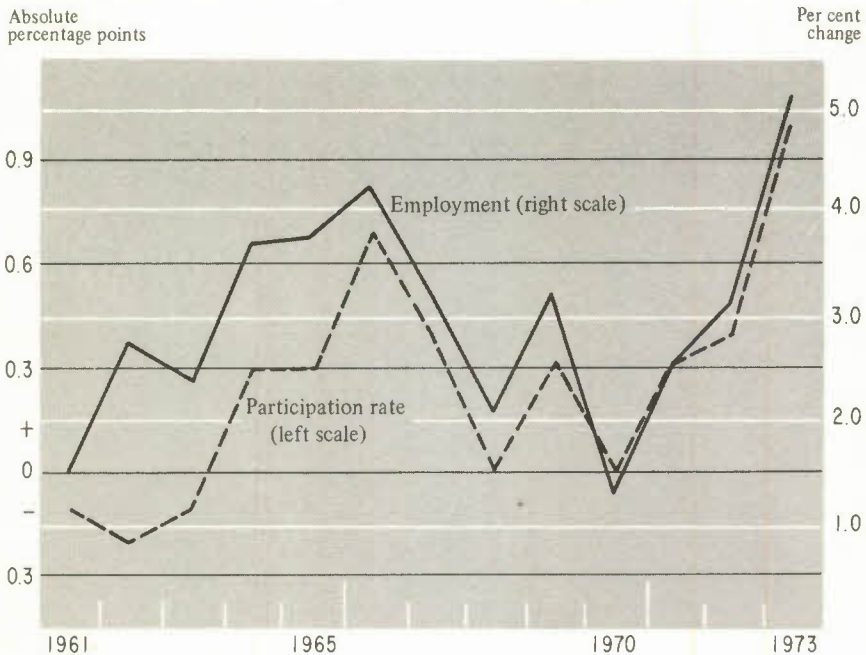
Along with stubbornly high rates of unemployment, inflation was the other distressing aspect of performance in 1973. Increases in the GNE price deflator – the broadest measure of price change in the economy – accelerated from 4.8 to 7.6 per cent between 1972 and 1973. A closer look at the data also indicates that price increases tended to be larger in the early stages of the production process; for example, wholesale prices, which are closely connected with primary commodities, rose 21.5 per cent in 1973; industry selling prices increased 12.0 per cent; and consumer prices were up 7.6 per cent.

Underlying this latter phenomenon was the rise in international commodity prices during the recent round of inflation. The Organisation for Economic Co-operation and Development (OECD), in a recent report,



Chart 2-3

## Annual Changes in Employment and the Participation Rate, 1961-73



SOURCE Based on data from Statistics Canada.

drew attention to the strong and coincident upswings occurring in the major industrialized countries of the world as an important factor in the upsurge of world commodity prices. In Canada, the depreciation of the dollar against major currencies other than the U.S. dollar accentuated the effects of foreign growth by making the prices of many of Canada's farm, forest, metal, and mineral products more attractive to foreign buyers than previously. Also important were the special conditions that existed during the year – for example, the speculative and precautionary demands for basic commodities encouraged by international monetary instability, the short supply of agricultural commodities arising from a fall in world per capita farm production in 1972, the increasing monopoly profits of oil producers, the response of primary producers to years of declining relative prices, and the shift in the technological-ecological availability of primary commodities.<sup>1</sup>

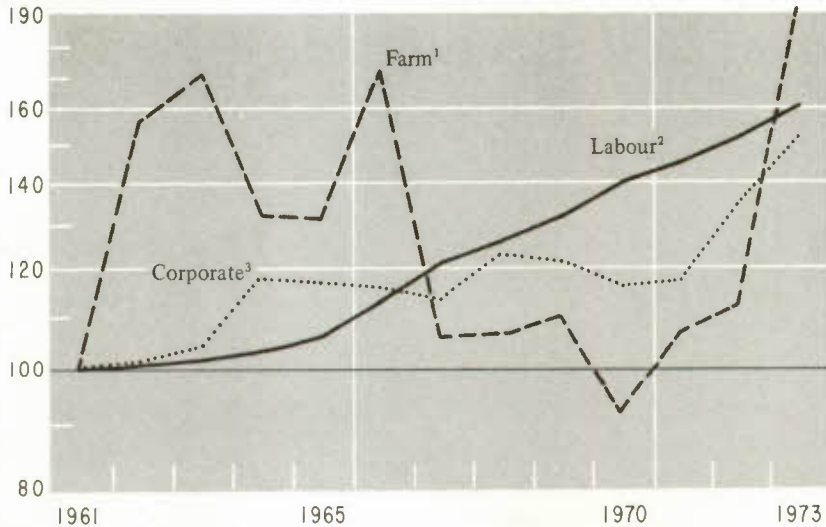
Domestically, there was a rapid restoration of corporate profit margins. With strongly rising food and grain prices, farm revenues also caught up after a number of years of lagging growth in income (Chart 2-4). The

<sup>1</sup> For a more detailed account, see "The Role of Commodity Prices in the Current Inflation," in the *OECD Economic Outlook*, December 1973.

Chart 2-4

## Index of Labour, Corporate, and Farm Income per Unit of Output, 1961-73

1961=100  
(ratio scale)



1 Farm income includes accrued net income of farm operators from farm production.

2 Labour income includes wages, salaries, supplementary labour income, and military pay and allowances.

3 Corporate income includes corporate profits before tax, adjusted for inventory valuation.

SOURCE Based on data from Statistics Canada.

increase in wages, salaries, and other labour income accelerated in relation to previous years but reflected the larger rise in the number of persons employed in the economy.

Typically, increases in unit labour costs slow down in the early stage of a recovery period, as the labour market is not yet active enough and productivity gains are large; consequently, profits have a tendency to accelerate. As the expansion proceeds, productivity increases tend to diminish; labour markets become tighter; wage increases accelerate; and the growth in profits slows down. Since 1970, there has been little indication of any check in the rate of rise of unit labour costs (Chart 2-4), while the rate of productivity growth, in comparison with earlier cyclical periods, has been conspicuously slow.<sup>2</sup> Profits, however, followed a more traditional pattern (Chart 2-4). After reaching a low point during the period of contraction in 1970, growth in profits accelerated. After tax,

2 It is worth noting the close relationship between wage, profit, productivity, and price changes. As a general observation, to prevent any further acceleration in the rate of price inflation, the change in income per unit of output will need to decelerate from recent levels unless the rate of productivity growth is markedly stepped up.

and excluding inventory gains attributable to rising prices, corporate profits rose 25.1 per cent in 1973, after having increased 23.8 and 5.5 per cent in 1972 and 1971, respectively. In relation to Gross National Product, corporate profits moved from a postwar low of 9.0 per cent in 1970 to 12.0 per cent in 1973. This is a higher share of national output than the business sector held during the middle sixties, before expansion peaked.

The increase in wages, salaries, and supplementary labour income, on the other hand, was 12.5 per cent in 1973. Although this is more than the increase registered in recent years, it is fairly modest in relation to the growth in employment. Earnings per worker in 1973 rose only 7.0 per cent, the smallest year-to-year gain since 1968, and below the increase in the consumer price index (CPI). This would suggest that, for wage- and salary-earners as a whole, real income declined in 1973. However, when income is deflated according to current expenditure as in the National Accounts, wage- and salary-earners appear on average to have enjoyed a small increase in their real earnings in 1973.

The Canadian economy continued to expand rapidly in the opening months of 1974. Real GNP in the first quarter rose at an annual rate of close to 7 per cent, well above the potential rate of output in the economy. This is in sharp contrast to the situation that prevailed in the United States, where output declined over the same period. The strength of the economy in the early part of 1974 was also reflected in a strong increase in employment. By June 1974, the aggregate unemployment rate was down to 4.9 per cent of the labour force. However, some moderation from the first-quarter rate of economic expansion was generally expected for the remainder of 1974. At time of writing, estimates of likely growth in 1974 are around 4 to 5 per cent.

### ACTUAL VERSUS POTENTIAL PERFORMANCE

The Council, in its *Tenth Annual Review*, proposed an updated set of target values for fifteen selected performance indicators, covering the 1972-76 period (Table 2-1).<sup>3</sup> In most cases, these target values took the form of proposed average annual rates of change in certain key measures of activity. The targets were based on simulations of future developments aimed at reducing the overall unemployment rate to 4.5 per cent in 1976,

3 The target values proposed for the Council's performance indicators represent what is judged to be a feasible set of medium-term economic objectives, the attainment of which would constitute good overall economic performance. These targets are proposed as an aid to government and private decision-making. They are revised and updated annually. The initial set of indicator values proposed in the *Ninth Annual Review* covered the period 1973-75.

using the CANDIDE econometric model of the Canadian economy. These simulations, in turn, incorporated various forecasts of economic activity in the United States and overseas countries. By comparing actual changes in 1973 with those changes simulated earlier with the aid of our model, we were able to form some judgments about the changes, about our model, and about the attainability of the targets. In this way, we attempt to detect, at an early stage, any deviation of the actual growth of the economy from the desired medium-term time-path and also to discover why the deviation has occurred and whether our targets need modification. With this perspective in mind, we now turn to a detailed examination of the economy's performance by comparing the actual and projected results for each of the performance indicators.

**Table 2-1**  
**Performance Indicators, 1972-76**  
(Calculated in 1961 dollars)

	Proposed Average Annual Change, 1972-76
	(Per cent)
<b>Part 1</b>	
Gross National Expenditure	6.0
Consumer expenditure	5.9
Total investment	9.0
Investment in machinery and equipment and nonresidential construction	12.0
Residential construction	1.5
Government current expenditures	5.0
Exports of goods and services	6.0
Imports of goods and services	7.5
<b>Part 2</b>	
Real disposable income per capita	4.2
Total output per person employed	2.4
Output per person employed in manufacturing	4.5
Total employment	3.4
Differential between Canadian and foreign prices	0
	(Yearly averages)
Number of housing starts (thousands)	245
Rate of unemployment in 1976 (per cent)	4.5

SOURCE Economic Council of Canada, *Tenth Annual Review: Shaping the Expansion* (Ottawa: Information Canada, 1973), p. 61.



### Gross National Expenditure

The target rate of growth proposed in the *Tenth Annual Review* for real Gross National Expenditure was 6.0 per cent in 1972-76. In 1973, the realized growth rate was 6.8 per cent (Chart 2-5). Although this was higher than the average target rate to 1976, it was broadly in line with our expectations at this stage of the expansion. Thus achievement of the target rate for the period as a whole would call for a slowdown in the years 1974 to 1976 to a growth rate of about 5.7 per cent. Given 1973 performance, achievement of 6 per cent growth from now to 1976 would not be desirable because it is unlikely that it would be accompanied by an acceptable degree of absolute or relative price stability. Recent experience suggests that if 6 per cent growth were achieved, increases in participation rates and expansion of the secondary labour force, shortages of skilled workers, bottlenecks, and domestic price pressures would continue.

A moderate scaling-down of the medium-term growth target thus appears to be called for in the interests of securing a better overall balance among the competing objectives of demand management policies. The Canadian economy was evidently operating virtually at potential in 1973 and can only grow as potential itself expands, normally between 5 and 5½ per cent a year. In the short to medium term, the growth rate of plant and machinery capacity is the limiting factor in the growth of potential. This critical issue is discussed further below.

### Consumer Expenditure

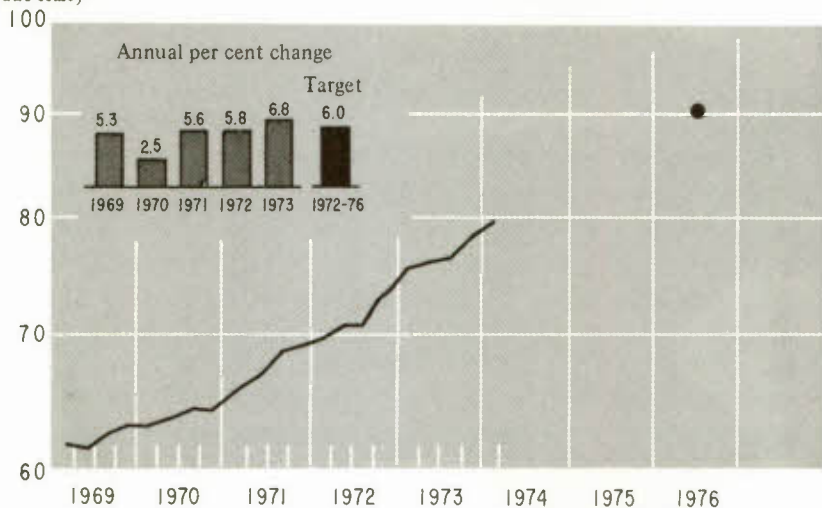
The target rate of increase for 1972-76 in real consumer expenditure was 5.9 per cent per year. The realized rate in 1973 was 8.0 per cent, about in line with our projections (Chart 2-6).

Spending on durable goods increased substantially, up 16.8 per cent in real terms over the 1972 level. This followed strong increases in 1971 and 1972 (Table 2-2). The size of the overall surge in such expenditures in the past three years was previously matched only in 1948-50 and probably reflected both the continued strong increase in personal disposable income (13.8 per cent) and the availability of credit. It may also have reflected the relatively high personal saving rates recorded in 1971 and 1972, which, we pointed out last year, could well lay the basis for substantial further increases in consumer spending.

Increases in the main categories of constant-dollar consumer spending are summarized in Table 2-2. The nondurable goods category of expenditure, in which prices rose the most, was the only one to show a smaller increase in volume in 1973.

**Chart 2-5**  
**Gross National Expenditure, 1969-76**

Billions of  
1961 dollars  
(ratio scale)

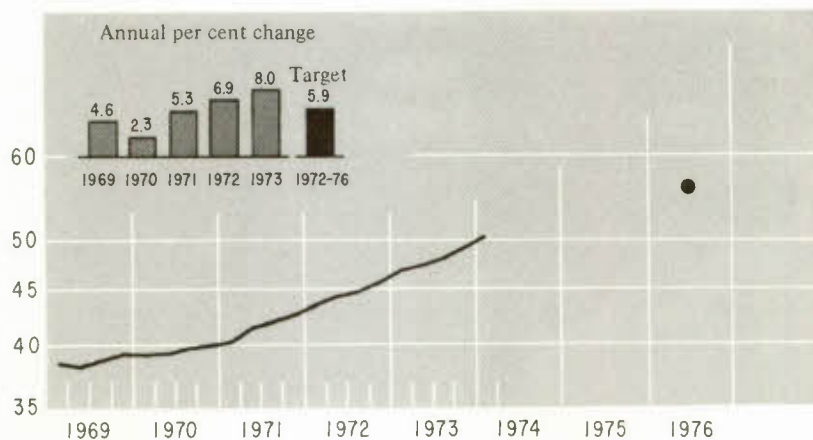


**NOTE** The black dot in the charts in this chapter represents the 1976 target level implicit in the average rate of change recommended last year.

**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Chart 2-6**  
**Consumer Expenditure, 1969-76**

Billions of  
1961 dollars  
(ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

The recent high rates of increase in total consumer spending are compatible with the overall 1972-76 target rate of 5.9 per cent, only if average increases over the remaining three years are reduced to about 5.0 per cent per year.

**Table 2-2**  
**Increase in Real Consumer Expenditure, 1971-73**

	1971	1972	1973
	(Per cent)		
Durables	13.3	14.7	16.8
Semidurables	6.5	9.4	11.8
Nondurables	6.0	6.0	5.6
Services	1.0	3.2	4.3
Total	5.3	6.9	8.0

SOURCE    Based on data from Statistics Canada.

### **Total Fixed Investment**

For all types of fixed investment combined, the proposed target rate was 9.0 per cent per year for the 1972-76 period. The increase actually registered in 1973 was 10.4 per cent (Chart 2-7). This was somewhat higher than expected for 1973, but mainly because housing, with continued easy credit and exceptionally heavy demand, was considerably stronger than projected. The performance of the various components of fixed investment over the past five years is summarized in Table 2-3.

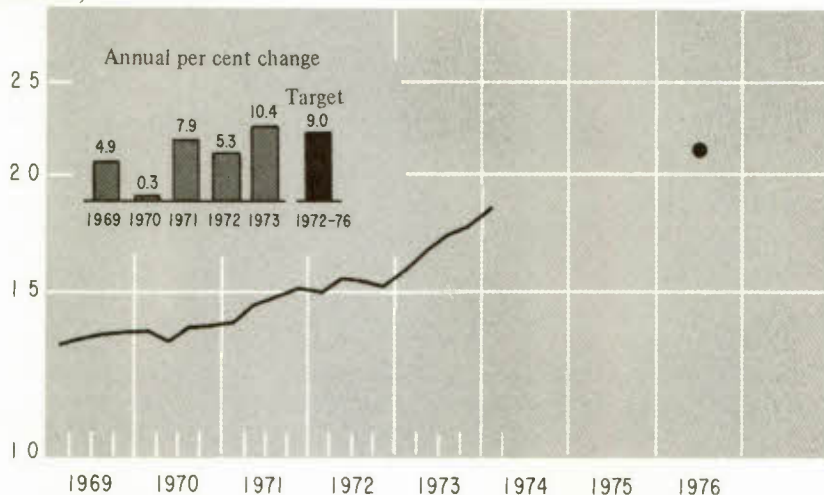
**Table 2-3**  
**Change in Total Real Fixed Investment, by Component, 1969-73**

	1969	1970	1971	1972	1973
	(Per cent)				
Government gross fixed capital formation	-2.4	-0.6	12.8	1.1	4.4
Residential construction	12.8	-11.0	18.6	10.9	12.8
Nonresidential construction	-0.6	7.3	4.2	-1.9	7.9
Machinery and equipment	9.1	2.3	2.6	10.3	13.9
Total	4.9	0.3	7.9	5.3	10.4

SOURCE    Based on data from Statistics Canada.

**Chart 2-7**  
**Total Fixed Investment, 1969-76**

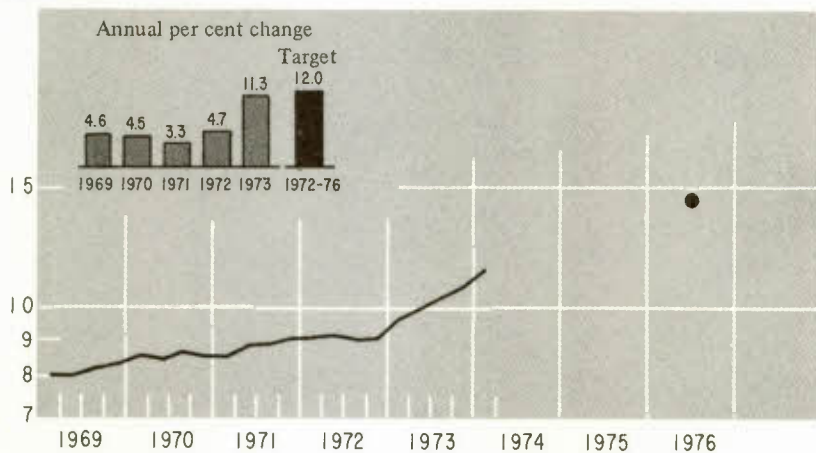
Billions of  
 1961 dollars  
 (ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Chart 2-8**  
**Investment in Machinery and Equipment and  
 Nonresidential Construction, 1969-76**

Billions of  
 1961 dollars  
 (ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.



The target rate of 9.0 per cent for total fixed investment is, of course, compatible with a considerable degree of continuing strength in 1974 and the following years, especially in business investment.

### **Business Fixed Investment**

The target for business fixed investment proposed for 1972-76 was an average increase of 12.0 per cent. This very high rate reflected the need to add to capacity in a wide range of industries in order to produce the high target output levels. The actual increase realized in 1973 was 11.3 per cent (Chart 2-8), slightly above our expectations for that year. Our underlying work suggested that there could be rising rates of increase in real demand for several years beyond 1973. Among the components, business nonresidential construction was not as strong as expected. Spending on machinery and equipment, on the other hand, was significantly higher. This divergence may be explained, in part, by the tax incentives that came into effect early in 1973, which could have had a quick impact on machinery and equipment purchases. Continued sluggishness in nonresidential construction could also well reflect the lagged effects of the uncertainties that surrounded investment decision-making through 1971 and 1972, as well as selective shortages of labour and materials. The recent growth record of these two components of business fixed investment is provided in Table 2-3.

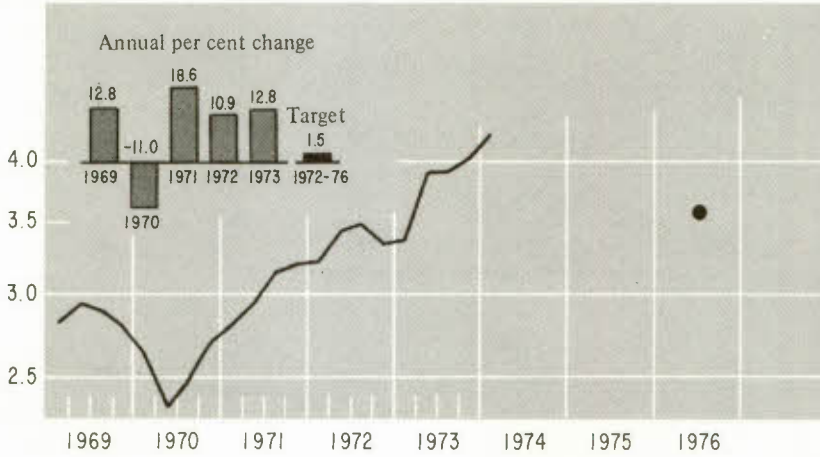
The insufficient growth of nonresidential construction in the past several years suggests the possibility of further substantial increases, involving the necessity of some "catching-up" in the years ahead. It is worth noting that increases in the mid-1960s, following a surge in output growth similar to that recently experienced, were 16.2 per cent, 10.5 per cent, and 14.5 per cent in 1964, 1965, and 1966, respectively. In summary, business fixed investment in total is now increasing at close to the expected rate, and the targets proposed continue to appear realistic and appropriate. Of course, any scaling-down of the target for aggregate real GNP growth would, as a result of the 1973 performance, have some impact on the investment indicators, but continuing strong increases would nonetheless still need to be forthcoming.

### **Residential Construction and Housing Starts**

The performance indicators for housing called for a yearly average of 245,000 starts in 1972-76 and an average increase of 1.5 per cent per annum in real residential construction. In 1973, the increase in real residential construction expenditure was 12.8 per cent, and there were 268.5 thousand housing starts (Charts 2-9 and 2-10). This exceptionally

**Chart 2-9**  
**Residential Construction, 1969-76**

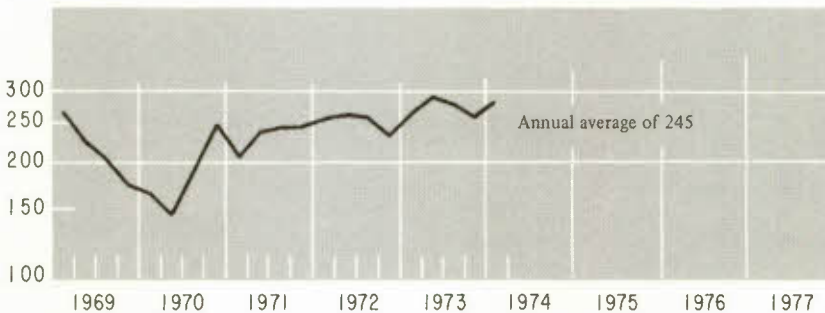
Billions of  
1961 dollars  
(ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Chart 2-10**  
**Number of Housing Starts, 1969-76**

Thousands of units  
(ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

strong performance was higher than we had expected on the basis of the results produced by the CANDIDE model, which takes into account only factors traditionally influencing housing demand.<sup>4</sup> Typically, housing activity is highly variable from one year to the next, as the charts indicate. The marked overachievement of housing demand, like other divergences between simulated and actual values, points to the presence of unusual elements in the recent situation.

Indeed, there appears to have been a high rate of nonfamily household formation in 1973, possibly related to the extensive growth in total employment and the consequent rise in internal migration. Net family formation is estimated to have increased by 123,000, less than half the level of housing starts and completions.

The continued easy availability of mortgage financing has no doubt facilitated the translation of demand for housing, but other factors must have contributed to this increasing demand and to sharply rising prices for accommodation. The tax reform legislation of 1970 accorded a preferred status to homeowners by exempting them from taxation on capital gains related to their principal residence. The taxation of all other forms of nominal capital gain resulting from the tax reform has altered the former neutrality of choice, for the mass of small investors, between owner-occupied housing and other forms of personal investment.<sup>5</sup> Also, continued increases in the price of housing, reflecting the relative shortage of serviced land, as well as rapidly rising material and labour costs, have made housing a hedge against inflation. Other vehicles for personal investment, which could protect an individual's real capital to some extent from erosion during periods of inflation, have become relatively less attractive, since half of these nominal gains are taxable. Of course, not all nominal or real gains on housing are nontaxable, and it must be recognized that many other factors have been involved in stimulating the demand for housing, including speculation.

The presence of inflation-induced distortions of demand makes the task of setting realizable medium-term economic objectives particularly

4 This is particularly so, when the rising number of mobile homes is taken into account, which the CANDIDE model does not do specifically. Statistics Canada estimates indicate that the numbers of mobile homes entering into use in 1972 and 1973 were 19,883 and 24,509, respectively. The estimated 24,509 mobile homes set up in 1973 represented roughly 19 per cent of the 131,552 single-detached-dwelling starts (exclusive of mobile homes) recorded in 1973.

5 By the same token, it has no doubt contributed to the diminished interest shown in other areas of investment, such as the market for common stocks, and hence to the lowering of price/earnings ratios. More generally, in today's environment of inflation and the taxation of nominal capital gains and interest receipts, the incentives to spending are high and the rewards to saving are low. This situation is a paradoxical one for Canada, particularly at a time when nationalistic sentiment is strong and the desire both to finance major investment projects in Canada and to attain a higher degree of domestic ownership is widespread.

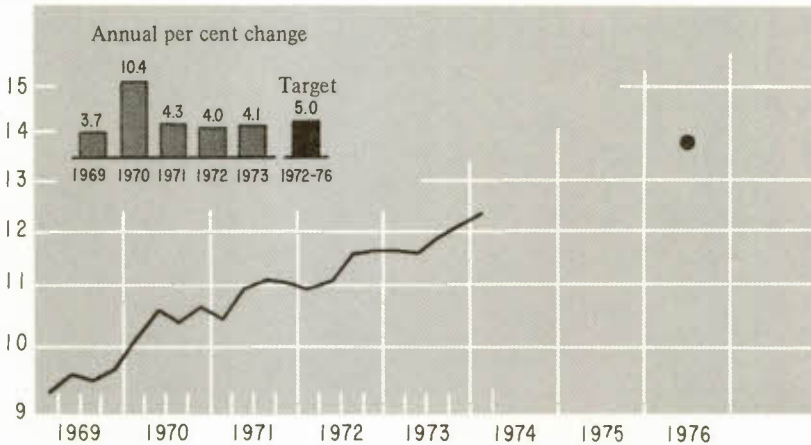
difficult.<sup>6</sup> It is not clear, in this situation, whether the higher-than-expected number of starts is a purely temporary development or not. For the time being, we do not propose any modification of our target on this account.

### Government Current Expenditures

The proposed target rate of growth of government current expenditures for 1972-76 was an average of 5.0 per cent in constant dollars. Actual spending in 1973 was 4.1 per cent (Chart 2-11). Only those government

Chart 2-11  
Government Current Expenditures, 1969-76

Billions of  
1961 dollars  
(ratio scale)



SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

expenditures often referred to as operating expenditures are included in this item: depreciation charges, purchases of goods and services from the private sector, wage and salary costs, and defence expenditures. Since the indicator is presented in constant-dollar terms, it actually measures the volume of government current spending. In the case of wages and salaries, the constant-dollar series measures the "volume" of labour employed

6 Since there is no single cause underlying the massive price increases in housing, there is no single remedy. A number of steps already taken at federal, provincial, and local levels may be effective in the coming months and years. Among factors that could lower the relative price of housing in the medium and longer term are a lower realized and anticipated future general rate of inflation, and the availability of comparable investment vehicles to protect real assets of individuals from erosion by inflation. It is worth noting that the relative price of housing should not be expected to rise indefinitely, but only to the extent necessary to establish a new equilibrium, given the rate of inflation, between housing and other assets.



(number of persons and man-hours worked) by the public sector since, in national accounting practice, constant productivity on the part of public employees is assumed. This "index" of labour input accounts for more than 50 per cent of total government current expenditures and for close to 60 per cent of nondefence expenditures, and therefore plays a preponderant role in determining the pace of total government current spending.

Overall, this 4.1 per cent increase in government current expenditures is lower than the average growth proposed for the period from 1972 to 1976, but it is broadly in line with our expectations, given the cyclical setting in which the Canadian economy has recently been operating. Typically, government current expenditures have shown a tendency to follow, with some delay, the course of the overall economy. Since, in 1972, the economy operated on balance below the target rate proposed for real GNP growth, it is not surprising to find government current expenditures in 1973 growing at a slower pace than the target rate for 1972-76. Given the strong performance of the Canadian economy in 1973, our expectation is that government current spending will show higher growth in 1974.

### Government Transfer Payments to Persons

Government transfer payments to persons were not part of the performance indicator framework proposed in the *Ninth Annual Review*. However, after careful examination of the macro-economic implications of continued rapid increases in transfer payments, the Council recommended in its *Tenth Annual Review* that increases of such transfers not exceed an average yearly rate of 11.2 per cent in the 1972-76 period. Actual increases since 1969 are shown in Table 2-4.

Table 2-4  
Increase in Transfer Payments to Persons, 1969-73

1969	1970	1971	1972	1973
(Per cent)				
12.6	13.4	18.3	19.7	13.0

SOURCE Based on data from Statistics Canada.

After increasing sharply in 1971 and 1972 following the extension of major federal transfer programs, government transfer payments to persons increased slightly faster than the recommended rate in 1973. In fact, the rate of increase in transfer payments in 1973 was slightly lower than that indicated for that year in the Council's projections set out in the *Tenth*

*Annual Review.* While federal transfers have grown in line with the projected rate, provincial and municipal transfers seem to have been significantly lower. Because of the unavailability of more disaggregated data at time of writing, it was impossible to determine in which area our projections were a little high.

Looking to the future, it would appear that the recommended rate has become almost impossible to achieve because of the rapid intensification of inflationary pressure. The Council has already expressed its awareness that, because of previous commitments, notably to family allowances, realization of the recommendation meant reduction in the rate of increase of payments under other social programs. With almost full indexing of federal and Quebec programs, in a much more inflationary environment, such reductions are not expected now unless inflation itself is contained.<sup>7</sup> This conclusion in no way modifies the basic judgment underlying our recommendation that gradualism in the rate of increase of transfer payments seems appropriate in a period of strongly rising capital expenditures and a high rate of inflation, so as not to add further impetus to wage and salary demands arising from stepped-up attempts by those adversely affected by taxes and inflation to preserve their after-tax real income.

### Exports of Goods and Services

For exports of goods and services, the target for the performance indicator called for an average rate of growth of 6 per cent in 1972-76. The actual rate realized in 1973 was 8.3 per cent (Chart 2-12.)

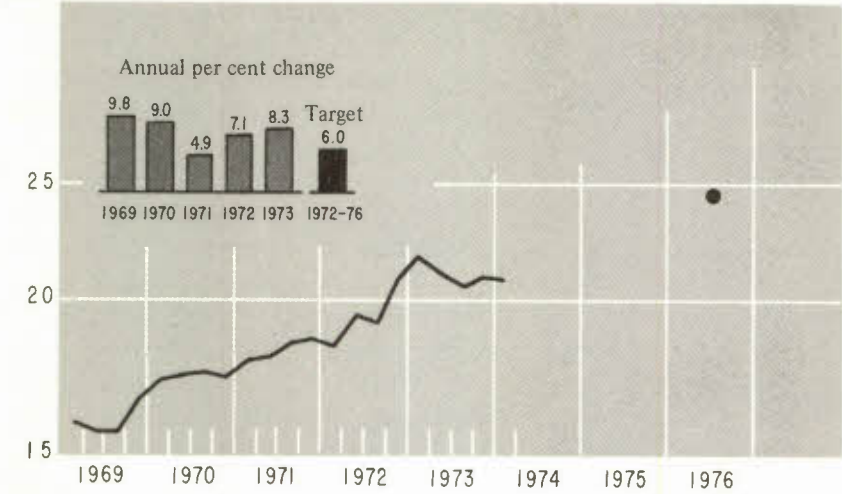
Although this performance exceeds the average target rate to 1976, the underlying pattern we had envisaged was of a stronger increase in 1973, followed by considerably reduced rates of increase thereafter. Grain and other food shipments were significantly lower in the last few months of 1973 than expected because of strikes, shortages of boxcars and, later, the severity of weather conditions in the West. Exports of other commodities were also affected in various ways. In the case of oil, gas, and sulphur, export licensing and the diversion of oil shipments to Eastern Canada caused some shortfall from anticipated export levels. Strikes, transportation difficulties, and capacity shortages affected exports of lumber, newsprint, iron and steel, and nonferrous metals. Canada's ability to recapture some of the losses of potential exports and to achieve the suggested export figures depends critically on the solution of present inland transportation, ocean shipping, and capacity difficulties. Over the

7 Our recommendation was clearly intended to be interpreted in context. The recommended rate of growth of transfer payments to persons was 11 per cent, in line with the growth rate projected for current-dollar GNP and total government expenditure (Table 3-3, p. 69, and also p. 71 of the *Tenth Annual Review*).

**Chart 2-12**

**Exports of Goods and Services, 1969-76**

Billions of  
1961 dollars  
(ratio scale)

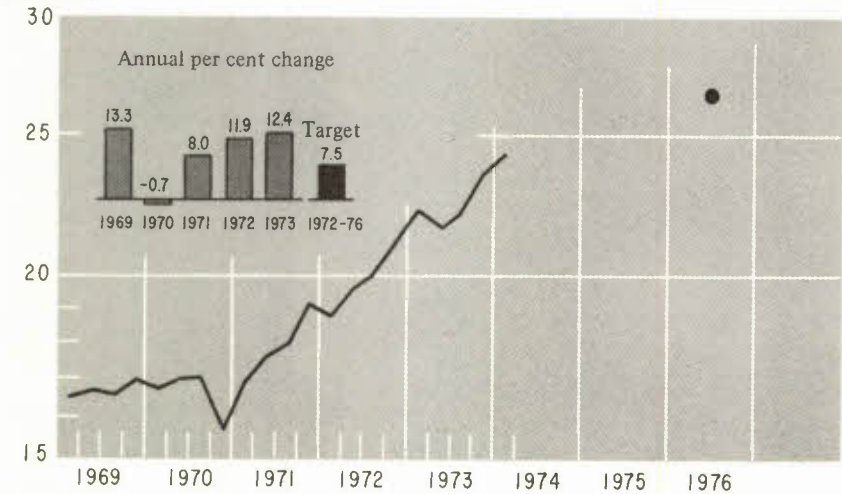


**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Chart 2-13**

**Imports of Goods and Services, 1969-76**

Billions of  
1961 dollars  
(ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.



longer term, reductions in Canadian and foreign trade barriers would be necessary to achieve substantial progress in Canadian exports.<sup>8</sup>

### Imports of Goods and Services

The indicator for imports called for a 1972-76 average target rate of growth of 7.5 per cent; the rate realized in 1973 was 12.4 per cent (Chart 2-13).

Such a large increase was anticipated for this particular year, in view of the strength of the Canadian economy as a whole and the extent of expenditures on machinery and equipment in particular. In fact, the recorded increase was only slightly above our expectations.

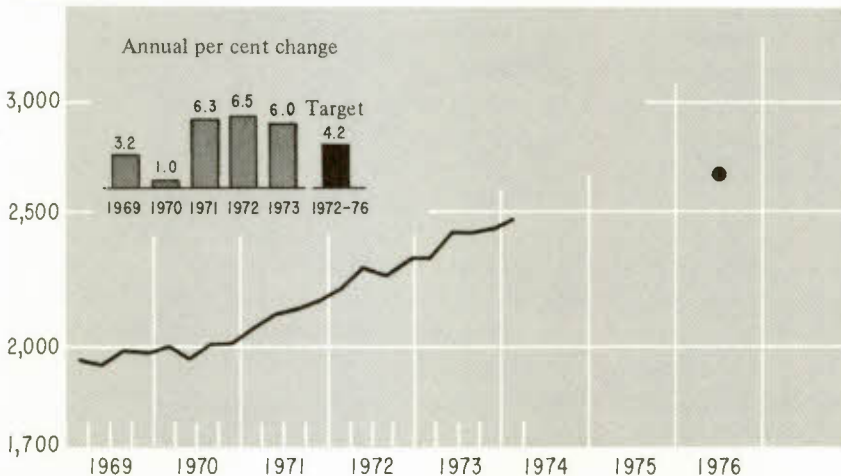
### Real Disposable Income per Capita

While the 1972-76 average growth proposed for this indicator was 4.2 per cent, the increase actually recorded in 1973 was 6.0 per cent (Chart 2-14). This percentage rise was significantly above what we anticipated for 1973. It is therefore useful to look at the components of this important measure in more detail (Table 2-5).

Chart 2-14

#### Real Disposable Income per Capita, 1969-76

1961 dollars  
(ratio scale)



SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

<sup>8</sup> For elaboration, the reader is referred to a forthcoming Council study on Canadian Commercial Policy.

**Table 2-5**  
**Change in Real Disposable Income per Capita,**  
**by Component, 1969-73**

	1969	1970	1971	1972	1973
	(Per cent)				
Wages, salaries, and supplementary labour income	12.0	8.5	9.9	11.0	12.5
Other personal income <sup>1</sup>	7.0	2.9	8.4	11.0	20.1
Transfer payments to persons	12.6	13.4	18.3	19.7	13.0
Personal income	11.0	7.8	10.5	12.0	14.0
Current transfers to governments <sup>2</sup>	23.0	15.9	12.1	11.0	14.7
(Income taxes included in current transfers)	(26.0)	(18.0)	(15.1)	(12.5)	(16.6)
Personal disposable income	8.7	6.1	10.1	12.2	13.8
Personal expenditure deflator	3.9	3.6	2.4	4.1	6.1
Real personal disposable income	4.7	2.4	7.6	7.8	7.3
Population	1.4	1.4	1.3	1.2	1.3
Real disposable income per capita	3.2	1.0	6.3	6.5	6.0

1 Includes military pay and allowances; net income received by farmers from farming; interest, dividends, and miscellaneous investment income; current transfers from corporations; current transfers from nonresidents; capital assistance; and net income of nonfarm unincorporated business.

2 Includes income taxes, succession duties and estate taxes, employer and employee contributions to social assistance, and government pension funds plus other current transfers.

SOURCE Based on data from Statistics Canada.

It is apparent that one of the main reasons for the strong growth in real disposable income per capita was the rise in the "other personal income" category, which climbed by 20.1 per cent in 1973. Wages, salaries, and supplementary labour income rose at a higher rate than in 1972, but this acceleration, as noted earlier, represented an increase in the number of employees rather than in the amount received per employee. On the latter basis, the rise in 1973 was 7.0 per cent compared with 7.6 per cent in 1972.

Outstanding increases in personal income are evident in the farm and investment categories (Table 2-6). Farmers have benefited substantially from higher domestic and world prices, particularly for grains, after six years of relatively depressed income, as shown in Chart 2-4. In the simulations presented in Appendix B we have tried to allow, in an approximate way, for the effects on farm incomes of higher world prices for agricultural products during and following the new target period 1973-77.

Real disposable income per capita is the broadest possible measure of the standard of living of a population. As the expression itself indicates, it is income after tax and adjusted for price changes. A 6 per cent annual increase in this indicator is substantial by any standard and well above

**Table 2-6**  
**Increase in Personal Income, by Component, 1972-73**

	1972	1973	Per Cent Change
(Millions of current dollars)			
Wages, salaries, and supplementary labour income	56,976	64,108	12.5
Military pay and allowances	979	1,039	6.1
Net income received by farm operators from farm products	1,597	2,972	86.1
Net income of nonfarm unincorporated business (including rent)	6,359	6,803	7.0
Interest, dividends, and miscellaneous investment income	6,254	7,467	19.4
Transfer payments to persons	9,891	11,180	13.0
Other transfers	384	423	10.2
Personal income	82,440	93,992	14.0

SOURCE Based on data from Statistics Canada.

what the Canadian economy can generate in the medium and long term. The fact that the 6 per cent increase in 1973 followed two successive years of similar advance is worth noting.

### Total Output per Person Employed

The indicator for output per employed person called for an average 2.4 per cent increase per year in 1972-76, in line with long-run experience in the postwar years. The actual increase recorded in 1973 was 1.6 per cent (Chart 2-15). While significant upward revisions to first estimates of output have taken place in the past, it would appear that during the last few years there has been a marked slowdown in the growth of output per person employed (Table 2-7).

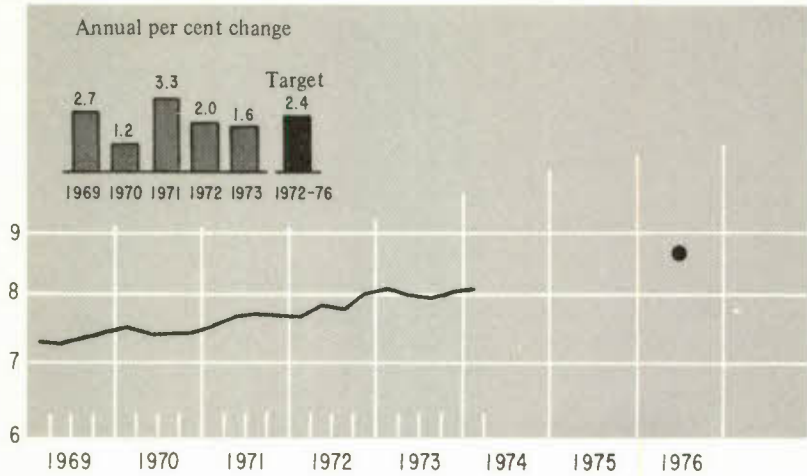
**Table 2-7**  
**Change in Output per Person Employed, Total Economy, 1961-73**

1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
(Per Cent)												
0.5	4.1	3.3	3.3	3.2	2.9	0.2	3.6	2.7	1.2	3.3	2.0	1.6

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Chart 2-15**  
**Output per Person Employed, 1969-76**

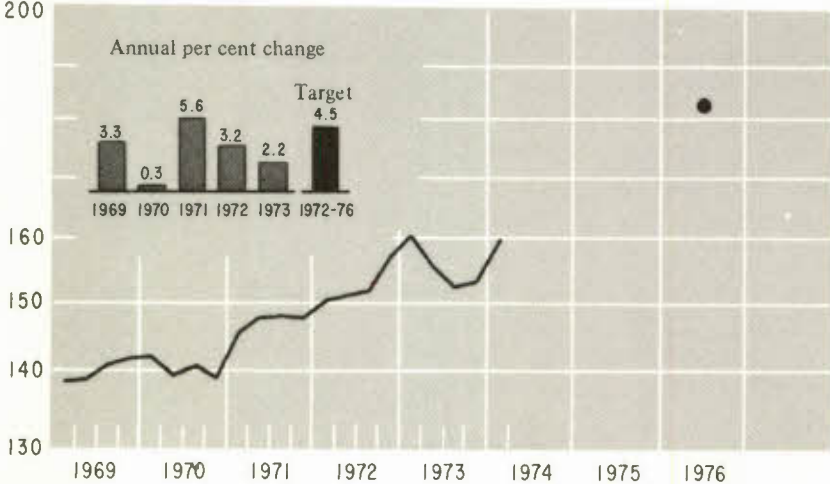
Thousands of  
 1961 dollars  
 (ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Chart 2-16**  
**Index of Output per Person Employed in Manufacturing, 1969-76**

1961=100  
 (ratio scale)  
 200



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

Rates of increase since the 1970 trough compare unfavourably with those experienced following the 1961 trough or even those following the general slowdown in the economy in 1967. The measured 1973 increase is particularly small when account is taken of the continued large expansion both of real demand for consumer durables and real purchases of machinery and equipment, and the consequent strong growth (8.2 per cent) in manufacturing output. The pattern of the productivity slowdown is somewhat different when looked at in terms of rates of increase in output per man-hour, but the poorer performance in the current expansion is again evident. It is clear that underlying the slowdown in the rate of productivity advance have been the rapid growth in employment of people in the low-wage, low-productivity categories and the excessive rates of utilization of capital stocks, with bottlenecks emerging in many areas, including a number of manufacturing industries. However, it is not clear whether these factors alone explain the moderation in productivity advances. This phenomenon of slowdown is apparent, as Chapter 8 indicates, in most sectors of industry.

We cannot be sure of the causes of this slowdown, and we cannot determine the extent to which it may be partly illusory, temporary, or permanent. This is clearly an area in which a great deal more information is needed. It is not attainable from our model, and we propose to seek it through further specific research and other sources, such as the National Economic Conference.

### **Output per Person Employed in Manufacturing**

The target rate of growth for output per person employed in manufacturing was an average of 4.5 per cent in 1972-76, while the actual increase recorded in 1973 was only 2.2 per cent (Chart 2-16). This performance was not only poor but was also substantially below what might have been expected in view of the strong 1973 increase in manufacturing output.<sup>9</sup>

9 In comparison with other countries, productivity, measured in terms of output per man-hour, has risen much more slowly in North America than in the major countries of the European Economic Community or Japan. Between 1966 and 1973, there was an average annual increase in manufacturing output of only 3.3 per cent in the United States and 3.8 per cent in Canada. The corresponding figures for the other countries were: United Kingdom, 4.6; France, 7.2; Germany, 6.2; and Japan, 12.7 (based on data from Statistics Canada and the National Institute of Economic and Social Research). In interpreting these data, however, attention should be drawn to the fact that productivity is a many-sided concept and that faster rates of growth in productivity in one country than another can reflect a large variety of different factors relating to the efficiency with which the factors are used or combined or to improvements in their quality. For example, the capacity to achieve economies of scale and specialization may well depend upon the size of a country's home market or its ability to penetrate export markets. In addition, the speed with which the skill level of the work force is upgraded or the quality and efficiency of the capital stock raised may also be among the factors contributing to differing rates of productivity growth among countries.



Very high rates of capacity utilization or even capacity shortages were experienced in a wide range of Canadian manufacturing industries: textiles, paper, printing and publishing, petroleum and coal products, chemicals, wood, furniture, metal fabricating, machinery, transportation equipment, electrical products, iron and steel, and nonferrous metals. The high rates of increase in real investment in manufacturing in 1973 indicate a strong response to the pressure of demand on capacity, to recent high profits and, possibly, to the manufacturing tax incentives. This expansion of capacity promises to alleviate shortages, and an improvement in productivity over the next few years is expected as a result. However, the 4.5 per cent average productivity growth target could well be somewhat overoptimistic as a medium-term objective under present circumstances. We, therefore, propose later a somewhat lower figure for the 1973-77 period but remain concerned at the poor performance in this sector and in the economy as a whole.

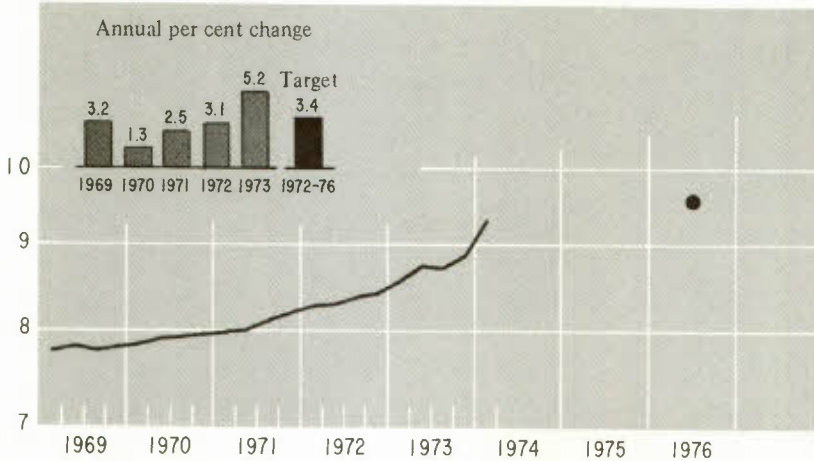
### Employment

The actual increase in employment in 1973 was a phenomenal 5.2 per cent (Chart 2-17). Although our work indicated that a large increase would be forthcoming, the size of the gain actually realized was still substantially in excess of what we had anticipated. The overachievement was associated with an unexpected jump in the labour force participation rate and the disappointing improvement of labour productivity. Here again, the divergence between the projected and the actual increase seems to point to the presence of abnormal forces. The CANDIDE model used in the simulations allows for changes in participation rates as the unemployment rate declines. The understatement of the rise in the participation rate thus may be partially related to the "stickiness" of the unemployment rate. In 1973, despite the large number of people classified as unemployed, the labour market appears to have been generally tight; increased employment was achieved mainly by drawing additional people into the labour force and not by thinning the ranks of the unemployed.

Of the total increase in the number of persons employed, the largest single increment – about 110,000 people – went into manufacturing, continuing the trend begun in 1972 (Table 2-8). The large increases in employment in manufacturing, trade, services, and construction no doubt reflect, to an important extent, the stimulus provided by the rise in consumer expenditures on durable goods and housing, and in the volume of machinery and equipment purchases.

**Chart 2-17**  
**Total Employment, 1969-76**

Millions of  
persons  
(ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Table 2-8**  
**Change in Employment, by Industry, as a Percentage of Total Change in Employment, 1970-73**

	1970-71	1971-72	1972-73
	(Per cent)		
Agriculture	-0.5	-11.6	-3.3
Forestry	0.0	-0.4	2.1
Fishing	1.0	0.0	0.7
Mining, quarrying, and oil wells	2.0	-2.0	-0.2
Manufacturing	2.5	24.8	25.8
Construction	12.0	2.4	11.2
Utilities	-1.0	2.4	1.4
Transportation, storage, and communications	6.0	8.8	8.6
Trade	5.0	32.0	20.5
Finance, insurance, and real estate	10.0	0.0	5.8
Community, business, and personal services	46.5	30.4	20.9
Public administration and defence	17.0	13.2	6.7
Total	100.0	100.0	100.0

**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

Employment for young people and women increased the most rapidly. The largest absolute increase, however, was recorded by prime-age men (126,000) – a group that in the past contributed more than average increments to productivity (Table 2-9).

**Table 2-9**  
**Increase in Employment, by Age and Sex, 1973**

		Thousands	Per Cent	Percentage Distribution of Increase
Men	14-19	59.9	13.0	13.9
	20-24	45.2	6.2	10.5
	25-54	125.7	3.6	29.3
	55+	4.0	0.5	0.9
Women	14-19	36.8	10.2	8.6
	20-24	32.7	6.0	7.6
	25-44	78.6	7.0	18.3
	45+	48.3	6.3	11.2
Total		429.4	5.2	100.0

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

The abnormal 1973 increases in participation rates and employment were evidently the result of the exceptional demand/supply conditions of 1973. They are unlikely to persist in a substantially less expansive environment.

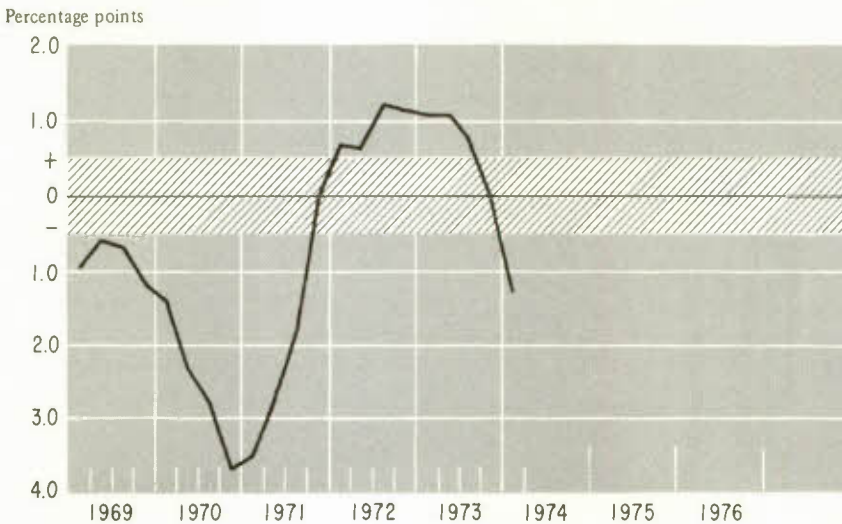
### Prices

In the *Tenth Annual Review*, we proposed a new price indicator, consisting of the difference between price changes in Canada and price changes in the main industrial countries, and we gave it a zero value, plus or minus half a percentage point. The recent pattern of this indicator is shown in Chart 2-18, which also contains a more technical definition.

The changes in the consumer price index experienced since the end of 1971 are clearly unsatisfactory. These changes have, of course, been high in both relative and absolute terms. In fact, all recorded values for the indicator during the period extending to the end of 1973 have exceeded zero, and we must look back to November 1971 before a period can be found in which the Canadian economy was inflating at a lower rate than

Chart 2-18

**Differential Rates of Price Change between Canada and  
Major Industrial Countries, 1969-73**



**NOTE** This chart records the absolute difference between year-to-year changes in the Canadian consumer price index and year-to-year changes in the weighted average index of the consumer price indexes of the principal OECD countries: United States, United Kingdom, West Germany, France, Japan, and Italy. The weights used for the latter are the proportions that each country's total bilateral import and export trade with Canada represents of the total import and export trade of the six countries combined with Canada. The trade weights are based on 1968-71 data.

**SOURCE** OECD, *Main Economic Indicators*, various issues, and estimates by the Economic Council of Canada.

the average for our principal trading partners. Further, until August 1973, the rate of increase in the CPI was substantially above the upper bound of the acceptable zone proposed for use with the indicator in the *Tenth Annual Review*. From mid-1972 to mid-1973, the rate of increase in the CPI was, on average, over one percentage point above that being experienced elsewhere, even though all of our trading partners suffered from markedly accelerating price trends (Chapter 7). The annual year-over-year change in the CPI rose from a rate of 5 per cent in December 1971 to more than 9 per cent in December 1973.

Towards the end of 1973, as rates of price increases rose elsewhere, our rate of inflation became more comparable with that of other economies. Canada's price performance continued to improve relative to that of other countries in the first quarter of 1974; our CPI increased about one percentage point less rapidly than that of our principal trading partners. This was not, however, attributable to lower rates of price increases in Canada but to marked price acceleration in Japan and the United States,



partly because of the crisis in commodity prices, in the case of the former, and the release of latent inflationary forces as the control program was weakened, in the case of the latter.

In the case of this indicator, we do not feel at this time that it would be appropriate to modify our proposed target value in any way, save perhaps to allow ourselves a wider margin within which to perform better than other countries in the current, very inflationary environment. Canadian price performance has clearly been unsatisfactory for some time, and it is equally obvious that domestic pressures have contributed to this. As in the United States, the strong monetary and fiscal stimuli applied in Canada since 1970 produced an expansion in the economy that created bottlenecks. These arose, in part, from the effects of the slowdown in 1970 – itself induced by policies of restraint in both countries. Future demand policies geared to the containment of inflation must obviously be longer-term in conception and execution. A gratifying development is an indication of growing awareness of this need among monetary authorities, including the Bank of Canada, whose Governor favoured such an approach in his latest report.<sup>10</sup>

There is little doubt that domestic demand in 1973 was excessive when judged by any criterion other than the size of the aggregate unemployment rate. Exchange rate objectives obviously contributed to the strong monetary growth that helped to bring about these results. Although we have explicitly recognized the important constraints that exchange rate considerations impose on the conduct of monetary policy, some upward flexibility of the exchange rate should be accepted in the interests of controlling domestic inflation. These observations are particularly relevant now when Canada could be confronting longer-term shifts in her terms of trade and large-scale investment inflows, both of which would tend to strengthen the exchange rate for some time. Attempts to offset these longer-term influences on the exchange rate by expanding the domestic money supply could lead to an acceleration of present domestic inflationary tendencies. At a more fundamental level, it is evident that a more concerted attempt is required by all industrial countries to control the inflationary growth of demand and, more particularly, the monetary base of such demand growth. There are indications of renewed determination among the OECD countries to co-operate in moderating future inflationary pressures. However, it appears unlikely that reasonable price stability can be restored quickly. Some years of *gradually* moderating growth of monetary demand will probably be necessary. On the fiscal side, the *Tenth Annual Review* indicated that a small budget surplus for the combined government sector appeared appropriate at that time.

10 Bank of Canada, *Annual Report* of the Governor to the Minister of Finance, for the year 1973.

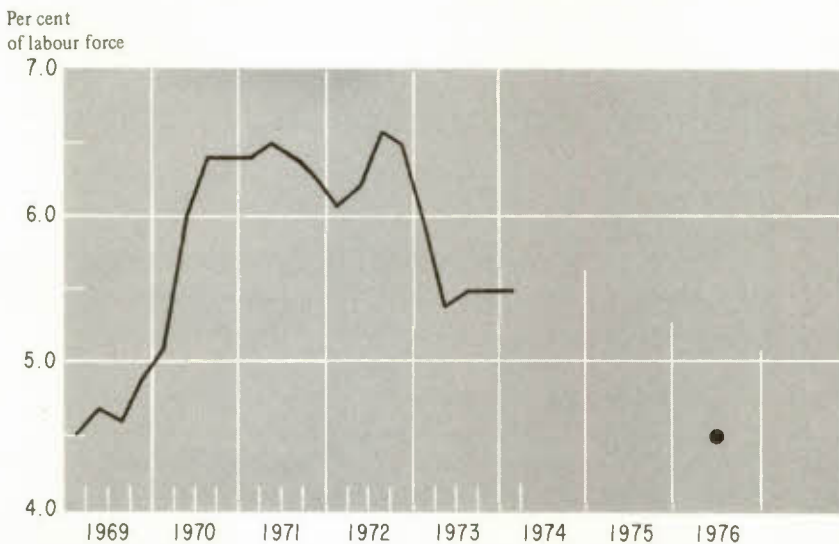


Data now available show that the government sector moved towards such a position in late 1973 and early 1974.

### The Rate of Unemployment

The unemployment target proposed for 1975 and 1976 in the *Tenth Annual Review* was 4.5 per cent. The actual average rate of unemployment in 1973 was 5.6 per cent, down from 6.3 per cent in 1972 (Chart 2-19).

Chart 2-19  
Aggregate Rate of Unemployment, 1969-76



SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

For men aged 25 to 54, the rate of unemployment was down to 4.1 per cent for the year, close to the level recorded in 1969. Despite this, the aggregate rate, at 5.6 per cent, was nearly a full percentage point above the 1969 level of 4.7 per cent. Thus unemployment rates for other than prime-age males have risen sharply since 1969, as shown in Table 2-10.<sup>11</sup> Even with a 5.2 per cent rise in employment, the aggregate unemployment rate

<sup>11</sup> It is these increases in unemployment rates *within* the young male and female categories that explain the shift in the aggregate rate. Although there have also been increases in the proportions of these groups in the labour force, this development, by itself, does not exert much effect on the aggregate rate. If, for example, the aggregate unemployment rate is re-estimated by applying 1961 labour force weights to the age/sex specific unemployment rates shown in Table 2-10, the resulting figure is 5.4 per cent compared with the 5.6 per cent rate actually registered.

Table 2-10  
Unemployment Rate, by Age and Sex, 1961-73

	Total	Men 14-19	Men 20-24	Men 25-54	Men 55+	Women 14-19	Women 20-24	Women 25-44	Women 45+
							(Per cent)		
1961	7.1	16.4	11.8	7.2	7.5	8.6	4.2	2.6	2.3
1962	5.9	14.4	10.0	5.6	6.5	7.9	3.7	2.4	2.0
1963	5.5	14.0	9.6	5.1	5.8	7.7	4.1	2.2	2.1
1964	4.7	12.3	7.9	4.1	4.9	7.6	3.3	2.0	2.1
1965	3.9	10.2	5.7	3.4	4.5	6.9	3.1	1.9	1.5
1966	3.6	9.7	5.3	3.0	4.3	6.4	2.5	1.9	1.6
1967	4.1	10.9	6.1	3.5	4.4	7.3	3.2	2.0	1.8
1968	4.8	12.7	7.7	4.1	5.0	8.3	4.2	2.3	2.0
1969	4.7	12.3	7.5	3.8	4.9	8.9	3.7	2.5	2.3
1970	5.9	15.0	10.5	4.8	5.5	11.4	5.1	3.1	2.6
1971	6.4	16.3	11.3	5.2	5.5	12.4	6.1	3.6	2.9
1972	6.3	15.2	11.6	4.9	5.1	11.3	6.6	4.1	3.1
1973	5.6	12.9	10.0	4.1	4.7	10.8	6.5	3.9	2.8

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

declined by only 0.7 per cent in 1973. It is difficult to sustain the view that the continuing relatively high rate of unemployment in 1973 represented any deficiency in aggregate demand. The remaining components of the aggregate rate of unemployment – apart from “cyclical” or “demand-deficient” unemployment – may be described as the seasonal, structural, and frictional components. To these may, perhaps, be added a small additional element representing those who claim to be looking for work but do not in fact want it, and who thus are not genuinely unemployed at all, although measured as such. We do not, at the moment, have much information concerning the relative importance of each of these components or of their changing importance over time.<sup>12</sup>

Despite the strong variations registered by the rate of job creation, the unemployment rate during the last three quarters of 1973 and the first quarter of 1974 remained remarkably stable – around a quarterly average of 5.5 per cent. It declined to 5.2 per cent during the second quarter of 1974, reaching a low of 4.9 per cent in June, while the overall participation rate showed a notable decline.

12 The determinants of aggregate unemployment are presently under review by the Labour Market Study group. Their findings will, it is hoped, throw additional light on the issues.

# 3

## *Conclusions and Recommendations*

The analyses in this Review have led us to a number of conclusions and recommendations, included here in the sections on performance, social indicators, and the National Economic Conference. In some cases, our conclusions must be regarded as no more than tentative, since the information and knowledge required to reach firm judgments are, for one reason or another, lacking. It is our hope that, even in these cases, by making it clear what information is needed, we may make some contribution to informed debate and stimulate others in government, universities, and the private sector to clarify further the issues involved.

### PERFORMANCE OF THE ECONOMY

The Economic Council has, from the time of its *First Annual Review* in 1963, encouraged policy-makers to take account of the supply capabilities of the Canadian economy in the formulation of demand management policies for Canada. In particular, it has developed, and fostered the use of, measures of Canada's economic potential and has encouraged the notion that the long-term growth of output should be as close to potential as possible.

However, we recognize that our measures of potential are not highly precise in that they do not indicate the appropriate level of total output at every point in time. Indeed, we now share the view that the potential rate and level of output may themselves vary, depending on the external environment postulated and the supply policies envisaged. We also recognize that aggregate unemployment, despite many indications of strain on the economy (including selective labour shortages), was, at 5.6 per cent in 1973, considerably above the 3.8 per cent level associated earlier with the achievement of potential. The Canadian economy was evidently operating close to, or at, its productive limits, in spite of some apparent slack in the labour market. The reason appeared to be that rapidly expanding demand following the 1970 slowdown had attracted new entrants into the labour force in unprecedented numbers, so that general shortages of plant capacity were encountered before widespread shortages of labour

became evident. This analysis seems to be confirmed by the comparison of the growth of capital stock and output.

From 1967 to 1972, the increase in capital stock was more or less equal to the increase in output, in both the manufacturing sector (4.8 and 5.0 per cent, respectively) and the economy as a whole (5.1 per cent in each case).<sup>1</sup> For total capital stock to have grown by the same rate as output in 1973 (6.8 per cent rather than the 5.1 per cent actually registered), the volume of net investment in 1973 would have had to be about 35 per cent higher. In manufacturing, additions to capital stock in 1973 would have had to almost double to match the increase in output. If 1972 were taken to represent a year of reasonable balance between output and capital stock in the economy, it would take about three years of roughly 10.5 per cent growth in the volume of total net investment to restore the 1972 ratio of capital to output, even assuming that output continues to increase only in line with the potential rate. We conclude that, even with more modest growth in output in 1974-76 and with rapidly increasing net investment, capacity will for some time remain tight in comparison with 1972. Attempts to raise output growth much above the potential rate would tend to delay still further the re-establishment of more normal relationships between capital stock and output.

Unfortunately, growth at the apparent potential rate appears unlikely to be accompanied by a further large reduction in aggregate unemployment. We cannot be absolutely sure of this, because the factors responsible for the jump in participation rates in 1973 are not certain, and we cannot predict with any precision how participation rates will behave in the future. Nor do we know as much as desired about the factors producing an average of 520,000 unemployed in 1973. A paradoxical feature of the 1973 experience was that, while employment increased by an unprecedented 430,000, unemployment declined by a mere 42,000. This puzzling phenomenon suggests the possibility, at least, that there are factors that tend to keep the numbers of measured unemployed substantially higher than in the past. Alternatively, it may suggest that the unemployment rate might move in a downward direction if employers find it increasingly difficult to fill vacancies with people outside the labour force.

It is anticipated that the Council's labour market study will provide a further useful perspective on the composition of unemployment or the characteristics of the unemployed at various points in time. Pending completion of that report, we merely conclude that deliberate pursuit of growth beyond its potential rate would not, under present circumstances,

1 Since capital stock data carry forward with a long lag the investment programs undertaken in earlier years, these growth rates mask the fact that business gross fixed capital formation increased only marginally over the period 1966-72. Thus, over this period, by relying heavily on capacity that had been put in place earlier, capital stock aged and potential capacity constraints accumulated.



reduce measured unemployment significantly; nor would it reduce the average duration of unemployment. On the contrary, it could well intensify inflation.

With the gap between actual and potential output having largely disappeared and with the economy demonstrating signs of strain, economic policy in 1973 and early 1974 moved away from its earlier strongly stimulative position. The rate of output expansion apparently peaked in the first quarter of 1974, with the economy continuing to operate under severe capacity limitations; and a slowdown in output growth appears to have been emerging in the remainder of the year as a result of weakness in the external environment, particularly in the United States.

Some fiscal offsets to the impact on the Canadian economy of reduced foreign growth in 1974 could result from decisions taken prior to 1974, for reasons not necessarily related to economic stabilization – namely, to increase family allowances; to index the personal income tax, and major transfer payments to persons, to the rise in the Consumer Price Index; to continue the corporate tax cut for the manufacturing and processing industries; and to maintain the across-the-board reduction in personal income tax granted in the February 1973 Budget. It would appear, however, that attempts to stimulate demand beyond that required to maintain an average increase in output at about the potential rate would make it difficult to achieve an adequate balance between supply and demand forces in the economy and would tend to aggravate inflationary pressures.

With the development of a strong upward trend in short-term interest rates in the United States, with the desire to maintain orderly conditions in the foreign exchange market, and with the need to ease the pressure on the Canadian economy created by the strong expansion of demand, monetary policy was largely directed towards less expansion during 1973. Such a stance was apparently maintained in the first half of 1974. The bank rate was raised in three steps in 1974, bringing to eight the number of increases since the spring of 1973. In the six-month period between January 1974 and July 1974, currency and demand deposits rose at an annual rate of about 9 per cent. When the money supply is defined more broadly to include personal saving and nonpersonal term and notice deposits, the increase amounts to a rate of 16 per cent, the higher growth resulting largely from strong increases in savings deposits related apparently to a change in personal portfolios.

Canada's performance had warranted, for some time, a clear moderation in the rate of monetary expansion, but no drastic curtailment. Continuation of such a policy would still be appropriate. Some upward flexibility of the external value of our currency could also be allowed in the interest of containing inflation. In an economy characterized by strains on capacity and severe shortages of certain types of labour and material, no real aggregate loss in the short term would result from appreciation of the

dollar, while there would be advantages to a lower rate of price increase and an improvement in the terms of trade. In the medium term, structural factors, such as Canada's privileged position with respect to natural resources and the anticipated inflow of external financing likely to be associated with their development, would continue to favour a tendency towards strengthening the external value of the Canadian dollar.<sup>2</sup>

### Performance Indicators for 1973-77

In developing a revised set of performance indicators for the period from 1973 to 1977, which we compare with the old indicators in Table 3-1, we not only had to take into account the recent performance of the Canadian economy but also to make some critical assumptions about the pattern of economic development over the next three years.

External economic conditions that will affect the future course of the economy are discussed in some detail in Chapter 6. In that chapter, we assume that the U.S. economy will recover mildly in 1975, following the marked slowdown in activity in 1974, and that growth in output will resume more strongly in 1976 and 1977. The unemployment rate in the United States is assumed to increase to about 5.5 per cent in 1975, then to decline to 5 per cent in 1977 as output growth improves. These projections are based on the June 1974 solution of the Wharton Annual and Industry Forecasting Model. The rate of increase in the GNE price deflator resulting from this solution slows down steadily from 9 per cent in 1974 to about 5 per cent in 1977. For Western Europe and Japan, we assume that the average annual growth of their industrial production will be about 6 per cent in the 1973-77 period.

In the energy area, the most crucial assumptions for the 1973-77 period relate to prices. We assume that the wellhead price of crude oil will increase to \$7.00 per barrel by 1976 and remain at that level in 1977; that the export tax will fall to \$3.60 per barrel in 1975 and to \$1.40 in 1976 and 1977; and that the international f.o.b. price will level off from \$8.50 in

- 2 As recommended in the *Tenth Annual Review*, the Canadian dollar should continue to float. The great difficulties that face the international monetary system suggest that the general floating of major currencies will continue for some time to come. It is important that the general float be operated in ways that are acceptable to major leading countries so that no country attempts to gain short-term advantages by competitive devaluation or by restricting imports. Thus the recent undertaking by the OECD countries to refrain from trade restrictions as a means of dealing with balance-of-payments problems created by the energy crisis and commodity price inflation is to be welcomed. We would also reiterate the recommendation that Canada participate fully in the GATT negotiations in order to maintain the access to foreign markets already gained in twenty-five years of negotiations; and to take steps to improve the productivity performance of Canadian industry by reducing foreign and Canadian barriers to trade.

**Table 3-1**  
**Performance Indicators, 1972-76 and 1973-77**

	Proposed Averages <sup>1</sup>	
	1972-76	1973-77 <sup>2</sup>
Gross National Expenditure	6.0	5.5
Consumer expenditures	5.9	5.0
Total investment	9.0	8.2
Machinery and equipment	12.0	9.5
Nonresidential construction		12.2
Residential construction	1.5	2.0
Government current expenditures	5.0	5.0
Exports of goods and services	6.0	4.5
Imports of goods and services	7.5	6.0
Real disposable income per capita	4.2	3.8
Total output per person employed	2.4	2.4
Output per person employed in manufacturing	4.5	4.0
Total employment	3.4	3.0
Differential between Canadian and foreign prices <sup>3</sup>	±0.5	±0.5
Number of housing starts (thousand per year)	245	245
Rate of unemployment in 1976 and 1977 (per cent)	4.5	4.5

1 For Gross National Product and its components, as well as real disposable income and productivity, the targets are average annual percentage changes calculated in 1961 dollars. The indicator for employment measures the percentage change in number of persons employed. The differential between Canadian and foreign prices is expressed in percentage points.

2 1973 is the base year to which the average annual percentage changes apply; 1974 is a year of transition for calculation purposes; 1975 to 1977 are the years to which the indicators apply, for policy purposes.

3 Absolute difference between the percentage change in the CPI, in Canada and the percentage change in the weighted index of consumer prices in the U.K., the U.S., West Germany, Japan, France, and Italy. The value of the indicator proposed in Table 3-1 of the *Tenth Review* implied a differential of a ±0.5 percentage point.

1974 and 1975 to \$7.00 in 1976 and 1977.<sup>3</sup> Aside from the construction of the Sarnia-Montreal pipeline and the commencement of construction of four tar-sands plants, no single large-scale investment project is expected to have an impact during these years.<sup>4</sup> Construction of the tar-sands plants would result in an additional investment of about \$625 million

3 Qualifications for the above are discussed in Chapter 5. The sensitivity of the results to alternative energy price assumptions is discussed in Appendix B.

4 Our calculations assume that the Mackenzie Valley pipeline will be built and that construction will start in the winter of 1976-77.



(in 1961 dollars) by 1977, or a cumulative total of about \$1.4 billion (in 1961 dollars) over the 1973-77 period. The full impact of all energy investment comes later in the 1970s.

In the case of government operations, we keep the assumption of constant nominal tax rates over the period covered by the performance indicators. For personal income tax, however, the indexation of exemptions and tax brackets to the change in the cost of living has been incorporated into the projections, as have the reductions to 1976 in the rate applicable to the first \$500 of taxable income, enacted in the 1971 Tax Reform. Allowance has been made for the increased royalty revenue accruing to provinces from higher oil prices and for the federal returns arising from the oil export tax. Similarly, on the expenditure side, account has been taken of the federal import subsidy on oil and oil products. Among other public expenditures, growth in transfer payments to persons is projected to decelerate considerably from its current high rate, as no additional major change in existing programs is assumed over the next three years.

The target growth rate for Gross National Expenditure is reduced from 6.0 to 5.5 per cent, reflecting the fact that the economy was operating close to full capacity in 1973. The former higher target rate for output growth was explicitly aimed at eliminating slack in the economy. We have scaled down the target rate for GNE because the economy can only grow at the potential rate, albeit at its upper limit. To allow for the re-establishment of a better capacity position, the proposed target rate would be consistent with slightly slower growth in 1974 and 1975 than in 1976 and 1977.

The target value for total investment is lowered to 8.2 per cent, because we assume a different time path for major energy-related investment than envisaged in the *Tenth Annual Review*.<sup>5</sup> This year we have also separated the business fixed capital formation indicator into its two major components – expenditures on machinery and equipment, and on nonresidential construction – so that the construction industry can be identified separately in the indicator framework, thus providing a standard against which progress towards more stable growth in this industry can be measured.<sup>6</sup>

5 The magnitude of additional investment in energy included in this Review for the indicator period 1973-77 is less, in real terms, than that considered in the *Tenth Annual Review* for 1972-76. This can be attributed to two factors: First, we now have a better idea of the time paths for major investment projects. In the *Tenth Annual Review*, the peaking of such investment took place in 1977, and the constant-dollar total for the period 1973-80 was \$8.0 billion. In our current analysis, such investment does not peak until 1979, two years after the period covered by the indicators, but the cumulative constant-dollar total for 1973-80 is \$5 billion. Second, the mix of energy projects under consideration has changed from that used in the *Tenth Annual Review*, in line with energy developments over the past year.

6 The adoption of a separate indicator for nonresidential construction was suggested in the Council report, *Toward More Stable Growth in Construction*.

Business nonresidential construction expenditures have been sluggish in recent years. Typically, outlays for nonresidential construction fluctuate widely and exhibit a cyclical pattern. The present rising level of investment represents, therefore, not only badly needed additions to the supply of real capital but also an expanding component of final demand. A shortfall in investment at this time would add to the strains that emerged in the economy in 1973. On the other hand, sharply increased expenditures would generate income and increase overall demand. Thus, in the medium term, the right balance must be found between the need to increase productive capacity and the need to ensure as much stability as possible in nonresidential spending and in the economy as a whole.

We believe that the rates appropriate for nonresidential construction expenditures and machinery and equipment spending are 12.2 and 9.5 per cent respectively. The higher target for nonresidential outlays reflects the larger nonresidential content of energy-related investments, as well as some catching-up of plant capacity. The indicator for housing starts remains the same at a yearly average of 245,000, and the indicator for the remaining component of total fixed investment – residential construction – is increased to 2.0 per cent, reflecting a change in expenditures per start.

The consumer expenditures indicator is set at 5.0 per cent, following its strong performance in 1973. The indicator for real disposable income per capita, however, is reduced slightly, to 3.8 per cent. These revisions are in line with the modification to the GNP growth target for the period 1973-77. The government current expenditure target is unchanged at 5.0 per cent.

Both the export and import targets have been reduced substantially from 6.0 and 7.5 to 4.5 and 6.0, respectively. The downward revision in exports arises from the much weaker external economic conditions confronting Canada than were envisaged a year ago. In the case of imports, the lower target rate is indicative of both the delay in the implementation of major energy-related projects and the reduction in the target rate for total output in the Canadian economy. The net effect of changes in the import and export indicators implies some deterioration in the current account balance and a corresponding increase in the degree of external financing.<sup>7</sup>

On the supply side, the decrease to 5.5 per cent in the indicator for Gross National Product affects mainly the rate of employment growth, which is reduced to 3.0 per cent. This follows a year in which employment

7 Although these volume changes could be partially offset by improvements in the terms of trade.



rose 5.2 per cent. The target for total output per person employed remains the same, at 2.4 per cent. In the manufacturing sector, the indicator for output per employee is revised downward to 4.0 per cent, which would appear to be a more realistic figure, given the pressures on capacity that were felt in a wide range of manufacturing industries in 1973. We retain a target of 4.5 per cent for the unemployment rate in 1977. This is in line with a continuing upward movement in participation rates, though not at the same rapid pace as in 1973. The participation rate is projected to increase from its current level of 57.8 per cent in June 1974 to an average of 59.0 per cent in 1977. This would contribute to an underlying increase in the labour force of about 2.8 per cent on average during the 1973-77 period. We also retain the relative differential between Canadian and foreign prices proposed in the *Tenth Annual Review*.

The new target values for the indicators must be viewed realistically as the result of an attempt to identify, as clearly and as consistently as possible, the set of values that might reasonably be sought as objectives during the next three-year period. We believe that the establishment of realistic target values for the economy can provide a useful adjunct to sound, forward-looking decision-making by governments and the private sector. Thus

#### *Recommendation 1*

*We recommend adoption of the interim performance indicator values for the years 1973 to 1977 set out in Table 3-1, including the new indicators for investment in machinery and equipment, and nonresidential construction.*

#### **The Problem of Inflation**

Inflationary pressures and developments related to energy have had, and will continue to have, a significant impact on the Canadian economy. The following recommendations – on international monetary arrangements, food prices, oil prices, and savings – deal either directly or indirectly with situations arising from these two factors.

#### *International Developments*

Our adoption of a relative standard for Canadian price performance was founded upon recognition of the international origins of much of the intensifying inflationary pressure experienced by Canada and other countries over most of the past decade. In Chapter 6, we draw attention to the very rapid rates of growth that have taken place in the money supply of the major industrial countries over the past six years. This growth was facilitated by, and often directly resulted from, the largely uncontrolled expansion of international currency reserves, particularly reserves of U.S.

dollars.<sup>8</sup> An important step in the process of controlling international inflation will be the future implementation of international monetary reform, designed, among other objectives, to establish co-operative international control over the growth of such currency reserves and to establish certain rules and consultative procedures to be followed when reserves exceed or fall short of agreed limits. The general direction in which the international monetary system could evolve has recently been established by the Committee of Twenty of the International Monetary Fund<sup>9</sup> but, in view of the continuing uncertainties related to inflation, the energy picture, and unsettled international conditions, detailed reform proposals have not been finalized. However, it is important that momentum towards reform be sustained and that the proposal in the reform package to limit the growth of currency reserves be implemented without undue delay.

In the immediate future, an easing of inflationary pressures requires general avoidance of excess aggregate demand. The Committee of Twenty have, in fact, affirmed their determination to adopt appropriate fiscal, monetary, and other policies to avoid inflation, recognizing that the main responsibility lies with individual national governments.<sup>10</sup> Recent meetings held under the auspices of the OECD have also recognized the danger of continued international inflation and have stated the need and the intention to avoid creating excess demand, as well as the necessity of shaping fiscal and monetary policies accordingly.<sup>11</sup> This evidence of international co-operation in the formulation of appropriate aggregate demand management policies is highly welcome. It is important that moves towards more restraint take place gradually, so that dangerous liquidity crises and similar financial disruptions may be avoided.

## *Recommendation 2*

*Recognizing the international origins of much of the inflationary pressure felt by Canada and other countries over the past decade, and bearing in mind the importance of the role played in the inflationary process by the growth*

8 Some aspects of the mechanism connecting exchange-reserve and money-supply growth in a fixed exchange rate system are discussed by R. A. Mundell in "Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates," *Canadian Journal of Economics and Political Science*, November 1963. Mundell shows that countries whose capital markets are well integrated with the world capital market and that are too small to affect world interest rates find it virtually impossible to offset (sterilize) the effects of stabilizing exchange rates on the domestic money supply. When such countries are characterized by persistent large balance-of-payments surpluses, the requisite stabilization of exchange rates leads to increases in their domestic money supplies.

9 International Monetary Fund, *IMF Survey*, "Supplement: Outline of Reform," June 17, 1974.

10 *Ibid.*

11 Organisation for Economic Co-operation and Development, *Observer*, June 1974.

*of the money supply in the leading industrial countries and the very rapid increase in monetary assets and liabilities not subject to central banking control, we recommend vigorous support by Canada of initiatives directed at securing co-operative international control over such monetary assets and liabilities and the growth of international currency reserves.*

### *Food Prices*

In the *Tenth Annual Review* we drew attention to the preponderant role played by food prices in the 1972 rate of inflation. Again in 1973, the sharp spurt in prices at the consumer level was particularly visible in food prices, which experienced their sharpest increase – 14.6 per cent – since the early postwar period. This was about double the rate registered in 1972 and about three times the rate recorded in the nonfood component of the Consumer Price Index. Food prices alone in 1973 contributed about half the overall increase in consumer prices, although their share of the consumer basket is about 25 per cent.

In view of the importance of food expenditures in total consumer expenditures and the severity of the rise in food prices, we favour the continued use of selective measures to deal with the problem rather than the adoption of any general system of price controls. These measures should represent sustained efforts to improve the stability of supply for agricultural commodities on a long-term basis and to maintain an equitable balance between the rights of efficient producers to adequate returns and the rights of consumers to food supplies at appropriate prices. Specific measures might involve subsidies for some basic dietary items, measures to expand supply consistent with orderly marketing, reductions in tariffs, and the removal of quota and other restrictions on trade in food commodities. Accordingly,

### *Recommendation 3*

*In dealing with the persistent food-price problems, we recommend the continued use of selective measures to increase food supplies and stimulate farm production rather than the adoption of any general system of food-price controls.*

### *Indexation*

Demands for the use of selective reference price indexes to adjust particular categories of earnings and transfer payments tend to increase with the persistence of severe inflationary price pressures. These demands are responses to the inherent uncertainties of inflation and the way it affects the achievement of the economic objectives of various social groups. Little is presently known about the consequences of indexation. Further, it is clear that some of these objectives will be less than fully realized

however complex the structures of particular indexation schemes. In line with well-established attitudes towards appropriate ways in which to define fiscal and contractual obligations, we feel that simplicity is a very desirable attribute to maintain. The purpose of indexation is not to protect the initial real standards of living of each individual, but to compensate for the loss of purchasing power arising from inflation. Thus it would not be desirable to adopt indexation methods allowing each particular category of participants to choose the price index that seems the most favourable. For these reasons, we would recommend that a single reference index be used wherever indexation is accepted. If certain other objectives are not achieved under a single system of indexation, other remedial policies can be sought. Until such time as the consequences of indexation are clearly spelled out,

#### *Recommendation 4*

*We recommend that when the principle of indexation is adopted in the public or private sector, a single general index be applied, irrespective of the groups or the categories of incomes involved.*

#### *Oil and Gas*

Our examination of alternative future patterns for the development of energy resources indicates that potential investment requirements for the production and transportation of oil and gas will be high in the late 1970s. This will particularly be so if high prices persist, if these high prices do not significantly deter domestic and foreign consumption, if there are no major easily accessible oil discoveries, and if oil imports are not stepped up. Even with relatively high domestic price levels, Canada's production of conventional oil will soon be declining and will fall below Canadian consumption levels in only a few years. Supplies from the tar sands, and from frontier oil fields involving large initial investment, will be needed at some time to fill this gap, at least partly. Decisions about the provision of such supplies need to be made shortly. It is important that the appropriate authorities expedite their ongoing inquiries into these matters with a view to providing a broadly acceptable, factual basis for certain critical decisions, including the timing of the construction of the Mackenzie Valley gas pipeline. The construction of such a major gas transportation facility would markedly intensify the heavy demands placed on the investment capacity of the Canadian economy if it were to proceed at the same time as the possible large-scale tar-sands development in the late 1970s.

Although Canada enjoys a temporary advantage in relation to other countries because, on balance, it is presently self-sufficient in oil and gas, it does not have long-term access to relatively cheap supplies. On the contrary, Canada will face sharply escalating oil production costs as more



expensive sources replace conventional ones. The policy of keeping oil prices to Canadian domestic consumers below the price of alternative supplies cannot be maintained for very long; and if it were pursued as a medium-term objective, it could serve to delay needed energy-conserving technological change, hasten the depletion of existing reserves, delay the provision of supplements and alternatives, lower the potential volume of savings, and perhaps foster abortive development of energy-intensive industries dependent upon the hidden subsidy for cheap oil and gas.

In considering the appropriate price level for Canadian oil supplies, it is obvious that, in the short run, higher oil prices would result in an increase in the cost of living in Canada. In the medium to longer term, on the other hand, oil prices will need to rise to restrain the growth of consumption of resources that are costly to replace, to stimulate the production of additional supplies, and to generate the necessary savings.

Despite the "economic" deterrents that a long-term rising trend in fuel prices will have on consumption, there are many decisions in the public domain regarding energy use that are not directly subject to the discipline of market forces. Such actions may serve to favour or delay the implementation of energy-saving technology and may foster or discourage a smooth transition to the exigencies of a less resource-abundant future. As well, over the transition period to higher energy prices, the market forces may not be sufficient to adequately discourage wasteful forms of energy by the private sector. To this extent, public authorities should inquire into, and encourage, the adoption of energy-saving techniques. For instance, they should emphasize long-term planning of urban developments designed to economize on the use of increasingly scarce energy and to accommodate the needs of people to move efficiently and comfortably within environmental standards. It is not too early to canvass the appropriate shape of energy developments after 1985, including the most desirable allocation of energy supplies among agriculture, transportation, manufacturing, and household needs.

Canadian supply policy for energy is directed towards achieving a greater degree of self-reliance. This implies that prices for energy products will need to remain high in order to achieve an appropriate balance between supply and demand in the long run. Yet there is the risk over the longer term that low-cost production of oil and gas in other parts of the world could provide competitive advantages to energy-intensive industries in other countries that have access to lower-cost feedstock. Canada, however, has medium-term advantages over potential competitors as a site for energy-intensive industries. These include a developed infrastructure, skilled labour, and stable government, all of which will allow Canadian industry to share competitively in the rapidly growing world market for petrochemicals, at least until these specific attractions decline in relative importance. In the light of the foregoing considerations,



*Recommendation 5*

*We recommend that the federal and provincial governments allow the domestic price of oil to move to international levels over the medium term and that they inquire into, and encourage, the adoption of energy-conserving practices.*

*Savings*

Our projections of the economy (see Appendix B) indicate that capital requirements in the late 1970s may be very substantial. They also show that the volume of savings generated in Canada by then could be inadequate, regardless of the extent to which energy resources are developed. In our model, only indirect evidence is given on the adequacy of domestic savings. Our only indicator in this respect is the current account deficit (in dollars or, better, as a percentage of GNP) and, by implication, the degree of reliance on foreign savings. Whether domestic savings are adequate or not, therefore, becomes a matter of judgment. In fact, our projections show increasing reliance on foreign savings throughout the 1970s, reaching 2.6 per cent of GNP in 1980 in the medium-price scenario for energy described in Chapter 5.

Given the high investment requirements over the medium term, we take the view that savings should be encouraged. This view is reinforced by the present inflationary environment. With anticipated inflation and the possibility of a negative real rate of return on investment, a high premium is given to consumption against saving; this, in turn, tends to increase inflationary pressures further. It is, therefore, important to ensure an appropriate balance between consumption and savings.

One potential source of savings is, of course, the higher profits, or taxes and royalties, associated with increased oil and gas prices. A larger volume of discretionary personal savings could perhaps be stimulated by appropriate new incentives. These incentives have, until very recently, been conspicuously absent.

The form in which savings are held and channeled into various uses is also clearly affected by the tax system and the way in which it treats various types of inflationary gain or loss. In this connection, it is apparent that the indexation of the personal income tax in 1974 represents only a partial correction of the tendency of the tax system to shift real resources from the private sector to the government sector simply as a result of the inflationary process. The sale of capital assets during periods of inflation, for example, may give rise to taxable gains, even though, in real terms, the seller may not have made a capital gain. Similarly, the real value of capital consumption allowances for tax purposes declines during periods of inflation, thereby reducing the ability of business firms to replace fixed assets through self-financing. The tax system during a period of inflation

may affect both the total supply of savings and the allocation of savings to the purchase of different assets. Thus

#### *Recommendation 6*

*We recommend that the federal and provincial governments, in formulating their fiscal policies, carefully consider the effects of taxes and inflation on the total supply and disposition of savings; that they examine the feasibility of providing further incentives to personal savings, preferably in forms that do not affect the structure of portfolios available to savers; and that they recognize the need to sustain an appropriate long-term flow of business savings.*

### SOCIAL INDICATORS

There is a clear need for an expanded framework within which to examine a broader range of socio-economic activities than those encompassed by the existing economic indicators. To this end, we have put forward in Chapter 1 a general approach for the development of social indicators, and in Chapter 4 we have proposed some first approximations of certain principal indicators that touch on three areas of socio-economic concern: housing, health, and the environment. The principal indicators proposed are not intended, and should not be considered, to represent all facets of well-being in these areas, but only certain particular aspects, and these imperfectly. Being first-approximation measures, they are subject to modification as more knowledge of these areas is developed and more information becomes available. At present, it is best to regard these indicators basically as monitoring devices that gauge the state of, and changes in, certain matters of importance to society and provide some initial insights of significance for policy and planning. They are a very modest contribution to what is needed in the way of measures of social phenomena if there is to be a better understanding of the socio-economic forces at work in our society. However, as knowledge of these and other areas increases, it will be possible at a later stage to introduce certain objectives associated with some of these measures.

#### **Housing**

Two indicators relevant to housing quality are proposed: a crowding index (persons per room), and the percentage of income paid per room. The second indicator is complementary to the first in that it is essentially a measure of the cost of housing quality in relation to the ability to pay. The change in the first indicator between 1961 and 1971 shows an overall improvement in the quality of housing in Canada. However, the change in

the second indicator over this period shows that the percentage of income paid per room has risen overall for the major urban areas.

The material presented in Chapter 4 suggests that there remain a number of problems with respect to the distribution of housing quality and its costs for particular groups and regions. Consequently, housing policies should take into account, to a greater extent than in the past, these distributional considerations. In particular, more emphasis should be given to policies that channel aid directly in an attempt to moderate disparities in housing quality that are more prevalent in certain areas or among certain socio-economic groups. An example of one such policy would be to encourage the renovation and enlargement of existing low-quality crowded dwellings. About 21 per cent of households in Canada live in conditions we regard as being excessively crowded. Since new starts at *peak times* are equivalent to only about 4 per cent of the existing stock, greater emphasis should be placed on renovation activities if we are to achieve a more rapid improvement in housing quality.

The National Housing Act (NHA), administered largely by the Central Mortgage and Housing Corporation, and certain provincial and municipal statutes contain provisions designed to promote the renovation, improvement, and enlargement of existing dwellings. A 1973 amendment to the NHA contains additional provisions intended to encourage these activities to a greater degree by extending preferred interest loans and grants under certain conditions. It is still too early to evaluate the efficacy of this new act, but questions about its flexibility (the conditions for aid may be overly restrictive and stringent) and the effectiveness of its incentives have been raised. Stronger measures may be necessary to provide sufficient encouragement to homeowners and landlords to undertake the renovation of low-quality dwellings, since the present pattern of incentives does not seem to be adequate for this purpose. Some measures could not easily be applied across the country in a uniform or broadly standardized fashion because of the great variety of local conditions. Thus the federal and provincial governments should encourage more co-operative efforts, involving direct action by the municipalities, with sufficient flexibility of financing to suit these varying conditions. Additionally, certain impediments to renovation activity that exist in some urban centres might reasonably be removed.

#### *Recommendation 7*

*We recommend that co-ordinated efforts be made by the federal government through the Central Mortgage and Housing Corporation and by the appropriate provincial and municipal authorities to provide more effective incentives to encourage the renovation, improvement, and enlargement of existing low-quality dwellings. Since smaller urban areas tend to have a higher proportion of crowded housing than larger centres, the federal and provincial*

*governments should make special efforts to aid these smaller urban areas to take advantage of the provisions encouraging renovation activity.*

## Health

Three initial health indicators are proposed: life expectancy at birth, the infant mortality rate, and the prime-age mortality rate (the effects of accidental and violent deaths, except suicide, being excluded in all cases).

Life expectancy at birth in Canada has increased considerably since 1931 and is continuing to rise. However, the disparity in life expectancy between the sexes has also grown over this period with the life expectancy for women exceeding that for men by about six years in 1971.

The infant mortality rate dropped by over one-half between 1951 and 1972; yet Canada's present rate still does not compare well with that of many other developed countries. The changes or distributional differences in the infant mortality rate do not appear to be associated with changing demographic characteristics, but rather with certain environmental, socio-economic, and health care delivery system factors.

About 40,000 people between the ages of 35 and 64 die every year from illness, and this represents a considerable social and economic loss to society. The overall prime-age mortality rate dropped only about 16 per cent over the period 1951 to 1972, but it declined considerably more for women (28 per cent) than for men (7 per cent). This difference is a contributing factor to the growing gap in life expectancy between men and women. What needs to be better understood are those socio-economic, environmental, and health care delivery system factors that have a significant impact on prime-age mortality.

While these mortality-based indicators are of considerable value in shedding light on certain important aspects of the health of Canadians, a more complete picture calls for the development of indicators concerned directly with morbidity. In order to develop such indicators, detailed, consistent, and comparable data on treated morbidity are required for all areas of the country. Such information is potentially available through the provincial medical care and hospital insurance plans,<sup>12</sup> and should include rates of participation in the medical care insurance plans; the number of cases treated for each participant broken down by the ICDA code;<sup>13</sup> the type and number of services rendered in each case, along with

12 In addition, there are intentions to make some improvements in existing hospital morbidity data.

13 See Statistics Canada, *Causes of Death, 1970*, Cat. No. 84-203 (Ottawa: Information Canada, 1971). Data in this publication are based on detailed categories of the International Classification of Diseases Adapted (ICDA), of the World Health Organization.



their costs; and other relevant data. This information should be disaggregated by age, sex, socio-economic characteristics, and regions within a province. The need for steps to improve and integrate health statistics has been noted in the context of a research strategy for health in a working document produced recently by the Minister of Health and Welfare.<sup>14</sup> The development of indicators, through the compilation and analysis of such data, will help to make the policy options clearer. We feel that the proposed "Canada Health Survey," under consideration by Statistics Canada and Health and Welfare Canada in consultation with the provinces, is necessary, especially since it may provide information on the extent of untreated morbidity.

#### *Recommendation 8*

*We recommend that efforts should be made by the Federal-Provincial Conference of Deputy Ministers of Health to ensure that the data produced by the organizations responsible for the administration of the provincial medical care and hospital insurance plans are consistent, comparable, and sufficient for the development of national morbidity-based health indicators. To this end, we suggest that the Conference should meet during the course of the next year specifically to begin discussion on this matter.*

#### **Environment**

The quality of the air we breathe, which is affected by society's production and consumption activities, affects our general health and well-being. The air quality indicator proposed in Chapter 4 covers a number of urban areas and is based on the ambient air concentration of several pollutants and on proxies representing the relative effect of these pollutants on human health and well-being. The value of this indicator is that it permits an overview of air quality in the individual urban centres, and for much of urban Canada as a whole, and points to major existing and emerging problems. According to this indicator and its components, the quality of urban air improved over the period 1971 to 1973, both generally and with respect to each of the pollutants except the nitrogen oxides.

Several undertakings would contribute to the formulation of an improved indicator of urban air quality and to the design of more effective abatement policies and programs. One would involve a more detailed and consistent monitoring of a wider range of pollutants in a larger number of urban areas; another, the development of a sounder scientific foundation from which the relative severity factors for the various pollutants could be

14 M. Lalonde, *A New Perspective on the Health of Canadians: A Working Document*, Government of Canada (Ottawa, 1974), see p. 69, no. 35.



derived. Further, decision-makers require regularly updated emission inventories<sup>15</sup> as well as some idea, on an urban and regional basis, of the nature of the relationship between emissions and ambient air quality.

#### *Recommendation 9*

*We recommend that, under the auspices of the Canadian Council of Resource and Environment Ministers:*

- a a comprehensive, consistent, and continuous air-pollutant monitoring system be established in all urban areas of 50,000 population or more; in urban areas of over 10,000 population, with poor air ventilation for significant periods of time; and in other areas containing industrial plants that emit large amounts of airborne pollutants – taking into appropriate account the technical and financial implications involved;*
- b aid and other encouragement be given to research for the purposes of determining more precise standards with respect to the acceptable ambient air concentrations of each major pollutant, or combinations of these pollutants, consistent with human health and well-being and the maintenance of the physical and natural environment;*
- c standardized approaches be employed to compile, on a regularly updated basis, emission inventories for all areas for which ambient air-quality monitoring is deemed necessary; and*
- d efforts be made to understand how pollutant emissions, the transformation of pollutants in the atmosphere, meteorological conditions, and other factors combine to produce the observed ambient air quality over major urban centres – using the expertise that can be found in many provincial ministries, federal departments and agencies, universities, and private corporations throughout Canada.*

### SUMMARY CONCLUSIONS OF THE 1973 NATIONAL ECONOMIC CONFERENCE

The first National Economic Conference, sponsored by the Economic Council of Canada, and held in December 1973, recognized a strong basic potential for Canada in the years ahead. However, Conference delegates also drew attention to a number of important constraints on the economy's ability to achieve full potential growth and maintain stable economic conditions. The Conference coincided with the worldwide state

<sup>15</sup> Emission inventories are data on the actual amounts of each pollutant emitted in a given area over a specific period, according to source (automobiles, power generation, heating, and other).

of uncertainty about the extent of energy shortages and the sharp increases in energy prices. Among other constraints and uncertainties, the most prominent were the impacts on the economy of inflation, shortages of a broad range of materials, mismatching in the supply of, and demand for, labour, international trade and monetary conditions, and the overall thrust of government policies. The need to present and discuss the goals and aspirations of Canadians against a background of economic potential was clearly recognized. Many of the Conference discussions, therefore, focused on issues closely related to matters taken up in this Review; they also helped to establish the priority issues for the 1974 Conference this December.

Although the Conference did not arrive at detailed prescriptions for policy, it identified broad issues and procedures that are significant in the national setting. For example, Conference delegates generally agreed on a need for:

- a Clarification of government policy positions—for example, in energy, transportation, agriculture, the further processing of materials, taxation, and in policies related to broader social objectives;
- b Stronger consultative mechanisms among the various levels of government;
- c Increased opportunities to co-ordinate the wide range of consultations already taking place among governments, industry, labour, farm groups, and consumers;
- d An expanded program by the Economic Council itself to ensure that its research and recommendations take fully into account the priorities of decision-makers in the private and government sectors, and that the Council offer maximum assistance to decision-makers in their efforts to relate to, and make use of, the Council's performance indicator framework; and
- e Consideration of the impact of policies and proposals on income distribution and on the well-being of Canadians.

Thus the National Economic Conference identified areas of concern in the decision-making process and in matters of consultation and "concertation" that relate very closely to recommendations that the Economic Council has made in recent years and continues to make.

Progress made at the 1973 Conference has thus constituted an important first step in the direction of achieving an adequate process of consultation in Canada. There remain, however, as the members of a number of industry committees emphasized, many diverse management-labour-government contacts and exchanges of view. They lose much of their effectiveness

because of the lack of co-ordination and the absence, within the consultative and decision-making process, of any clear perspective of longer-term, comprehensive objectives for individual industries, of government policies, or of economic and social goals and targets more generally. A number of delegates expressed the view that the individual industries and interest groups would benefit from a continuing organization that would consider, in a systematic way, the industry's perspective in the light of the developing economic situation and government policies. The continuing industry organization could be made more effective, in the view of some delegates, if its deliberations were set within the comprehensive analytical framework of the Economic Council of Canada. In that setting, an objective evaluation could be made of each industry's perceptions and of its relationship with plans and activities in other industries and sectors. The Economic Council, the Steering Committee of the National Economic Conference, the industry committees of the Conference, and the various other support activities of the Conference, might provide overall guidance for the private efforts being made.

In order to support the industry committees and the interest groups in this process of evaluation, the Economic Council and the Conference Steering Committee so far have taken four specific actions:

- 1 An analytical support group was established to evaluate industry sector targets and the national indicator targets developed by the Economic Council of Canada. This analysis is to be co-ordinated through the Conference secretariat.
- 2 The Economic Council has ensured that the perceptions of the Conference participants and support groups have an impact on the formulation of its new indicators.
- 3 The Council has requested specific comments on the report and the papers of the 1973 Conference from relevant departments and agencies of the federal and provincial governments.
- 4 The extension of contacts has been encouraged, on priority decisions and key Conference issues, to include a wider range of interest groups concerned with economic and social priorities including, among others, a larger number of government participants.

The recommendations by Conference delegates also dealt with other activities of the Economic Council. It was widely recognized by the delegates, for example, that the Council's assessments and medium- and long-term economic objectives have greater potential than has yet been used. A number of specific suggestions were made for further Council action to improve and extend that analysis and to work with the private sector and with government departments to this end. However, perhaps

the overriding requirement in this process, as perceived by many delegates, was the need to ensure that the Council's analysis and recommendations can be related more directly to their own perceptions and decision-making activities. This task of "translating" and making immediately relevant the Council's evaluations of the performance and of the economic targets and social goals also requires reciprocal action by those in business, government, and the community at large who would benefit from that analysis. This interpretive activity is receiving further study by the Council and by the Conference Steering Committee in its use of Council material.

Deliberations leading up to the 1973 National Economic Conference centred in sixteen committees. These represented such industries as mining, agriculture, and construction and included broader sectors such as energy, education, and health. Each committee prepared an Outlook Paper, providing both an assessment of the economic outlook and the conclusions and recommendations of that specific industry or sector. These papers deserve serious consideration in their own right.<sup>16</sup> A summary is set out in Chapter 8.

16 The Outlook Papers for the sixteen industries are reproduced in detail in the *Papers of the National Economic Conference, 1973*, referred to in the Introduction to this Review.

## **PART 2**



# 4

## *Selected Social Indicators*

Social indicators are the set of outputs and relevant inputs for a socially oriented area of concern. A general approach to the development of these indicators and the need for a small number of key output indicators for each area is discussed in Chapter 1. These latter measures are intended to gauge, in a summary manner, the state of, and changes in, certain major aspects of social activity. In this chapter, we propose certain first approximations of principal indicators for three areas: housing, health, and the natural environment. We also attempt to determine analytically some of the factors associated with variations in these indicators.

The choice of these particular areas is in no way intended to imply that other socially oriented areas are necessarily less important. In fact, work is also being done at the Council on the development of detailed input and output indicators for education (mainly in a co-operative project with the Ontario Ministry of Education),<sup>1</sup> urban systems,<sup>2</sup> and aspects of cultural and linguistic relationships. The areas of housing, health, and the natural environment were selected essentially because existing data and knowledge suggested that it might be relatively easier, in practical terms, to develop summary indicators for them. Moreover, the three areas chosen are considered important, since they may be among those affected to the greatest extent by changes occurring as a result of certain basic trends influencing the evolution of our society.<sup>3</sup>

The indicators proposed are not intended, and should not be considered, to represent all aspects of housing, health, or the natural environment; rather, they are simply certain important aspects of these areas at a first-approximation level. They are therefore subject to modification as more is learned of these areas and their interactions with other areas of concern. At present, these indicators should essentially be regarded as monitoring devices that provide some potentially significant insights for policy and planning. In the future, however, we will attempt wherever possible to set specific objectives for the outputs of these and other socially

1 J. Greenberg, "Social Indicators in Education: A Conceptual Framework," Economic Council of Canada Discussion Paper 6, 1974.

2 A. M. Maslove, "Urban Indicators: A Theoretical and Empirical Analysis, Part 1," Economic Council of Canada Discussion Paper 5, 1973.

3 D. W. Henderson, *Social Indicators: A Rationale and Research Framework*, Economic Council of Canada (Ottawa: Information Canada, 1974), Chapter 6.

oriented areas, taking into account the economic and social implications of these objectives.

The material presented in this chapter and later in Appendix A is a modest and preliminary contribution towards providing a wider spectrum of measures of socio-economic activity. We are cognizant of the interests and activities of other organizations in the development of social indicators. In fact, we have been greatly assisted in our work by a number of federal, provincial, and municipal departments and agencies and by private groups, not only in the difficult task of assembling the necessary data, but also through their advice and expertise.

### HOUSING INDICATORS

As an aspect of general community well-being and as a factor in human welfare, the quality of our housing stock is clearly of prime importance. Over the last two decades, the emphasis of Canadian housing policy has been on the *quantitative* requirements of housing rather than the *qualitative* adequacy of the stock. Our concern with quality includes more than measures of certain basic structural features of a house; it encompasses as well a concern with the environmental and social dimensions of housing.

What we put forward here are first approximations of principal housing indicators that attempt to take account of the effects of changing economic and social conditions on housing adequacy. In particular, we propose two indicators that, from our analysis, appear at present to best represent housing welfare in Canada.<sup>4</sup> The first is the *crowding index* or the number of persons per room, and the second is the *rent (or value) per room as a percentage of income*.<sup>5</sup> We should stress, at this point, that the crowding index is used not only because it is an important physical and social aspect of housing adequacy in itself, but also because it is highly correlated with other measures of quality and thus serves as a good proxy for them (see Tables A-1 and A-2). The second indicator, which is complementary to the first, provides a measure of the cost of housing quality in relation to the ability to pay; it is comparable over time and across regions.

#### The Crowding Index

Housing quality, as measured by the crowding index, has generally improved in recent years. The average number of persons per room in

4 For more details on the choice of indicators, see Appendix A.

5 The definition of rooms counted in the Census is as follows: "only rooms used or suitable for living purposes in the dwelling (including rooms occupied by servants, lodgers, or members of lodging families). Sun rooms, summer kitchens, recreation rooms, attic rooms, etc. . . are counted as rooms only if they are finished off and suitable for year-round living quarters. Not counted as rooms are: bathrooms, clothes closets, pantries, halls, or rooms used solely for business purposes."

all households in Canada has changed from .75 in 1951 to .64 in 1971 (Table 4-1). For a four-member family, this change is roughly equivalent to having one additional room. Further, though strict international comparisons are difficult, Canada appears to be among the countries with the least crowded housing (Table 4-2). However, in spite of this overall improvement, many households still live in unacceptably crowded conditions, and considerable regional and local differences, as well as those associated with certain socio-economic characteristics, remain.<sup>6</sup> It is to these and related matters that we turn our attention here.

**Table 4-1**  
**Crowding Index (Average Number of Persons per Room),**  
**Canada, 1921-71<sup>1</sup>**

	1921	1931 <sup>2</sup>	1941	1951	1961	1971
Total	.84	.79	.80	.75	.74	.64
Urban	.79	.75	.78	.74	.73	.63
Rural	.89	.84	.83	.75	.75	.68

1 These figures are not strictly comparable for the earlier years because of changes in definitions of what constitutes a household, dwelling, or occupied room.

2 Excludes rooming houses with nine or more lodgers.

SOURCE Census data from Statistics Canada and estimates by the Economic Council of Canada.

**Table 4-2**  
**International Comparison of Crowding Index<sup>1</sup>**

	Year	Average Number of Persons per Room
United Kingdom	1961	0.63
United States	1970	0.63
Canada	1971	0.64
Australia	1971	0.66
Sweden	1970	0.72
New Zealand	1966	0.75
Denmark	1965	0.80
France	1968	0.93
Japan	1970	0.97
Finland	1970	1.00

1 The definitions of what constitutes a room vary somewhat from country to country. For this reason, these figures are only approximately comparable.

SOURCE United Nations, *Statistical Yearbook, 1972* (New York, 1973); Statistics Canada; and estimates by the Economic Council of Canada.

6 Crowding differs from density in that the former is the number of persons per room in a household, and the latter is the number of persons per acre or square mile. The characteristics being measured by these two variables are therefore quite different.

Table 4-3  
Percentage Change in Crowding Index, Canada, by Region<sup>1</sup> and Major Urban Area, 1961-71

	Crowding Index		Percentage Change	Persons per Household <sup>2</sup>		Percentage Change	Rooms per Dwelling		Percentage Change
	1961	1971		1961	1971		1961	1971	
Canada	.74	.64	-13.5	3.9	3.5	-10.3	5.3	5.4	+ 1.9
Urban	.73	.63	-13.7	3.7	3.4	- 8.1	5.2	5.3	+ 1.9
Rural Farm	.73	.66	- 9.6	4.6	4.3	- 6.5	6.4	6.4	0.0
Rural Nonfarm	.77	.68	-11.7	4.0	3.8	- 5.0	5.3	5.5	+ 3.8
Atlantic Region	.74	.69	- 6.8	4.3	4.0	- 7.0	5.9	5.7	- 3.4
St. John's	.85	.72	-15.3	4.8	4.2	-12.5	5.7	5.9	+ 3.5
Halifax	.79	.67	-15.2	4.0	3.6	-10.0	5.1	5.4	+ 5.9
Saint John	.71	.64	- 9.9	3.8	3.6	- 5.3	5.4	5.6	+ 3.7
Quebec	.81	.70	-13.6	4.2	3.7	-11.9	5.3	5.2	- 1.9
Quebec	.81	.70	-13.6	4.2	3.6	-14.3	5.3	5.1	- 3.8
Montreal	.77	.68	-11.7	3.7	3.3	-10.8	4.9	4.9	0.0
Sherbrooke	.83	.71	-14.5	4.0	3.4	-15.0	4.8	4.8	0.0
Trois-Rivières	.85	.72	-15.3	4.3	3.6	-16.3	5.1	5.1	0.0

Ontario	.67	.60	-10.4	3.7	3.4	- 8.1	5.5	5.6	+ 1.8
Toronto	.67	.60	-10.4	3.7	3.3	-10.8	5.5	5.6	+ 1.8
Ottawa	.74	.63	-14.9	3.9	3.5	-10.3	5.3	5.5	+ 3.8
Hamilton	.68	.60	-11.8	3.7	3.4	- 8.1	5.4	5.6	+ 3.7
Windsor	.67	.60	-10.4	3.6	3.4	- 5.6	5.4	5.6	+ 3.7
London	.65	.56	-13.8	3.4	3.2	- 5.9	5.3	5.7	+ 7.5
Kitchener	.67	.60	-10.4	3.6	3.3	- 8.3	5.4	5.6	+ 3.7
Sudbury	.91	.76	-16.5	4.1	3.9	- 4.9	4.6	5.1	+10.9
Oshawa	.69	.63	- 8.7	3.6	3.5	- 2.8	5.3	5.6	+ 5.7
Kingston	.69	.59	-14.5	3.6	3.3	- 8.3	5.3	5.6	+ 5.7
Prairie Region	.76	.63	-17.1	3.7	3.4	- 8.1	4.9	5.3	+ 8.2
Winnipeg	.73	.62	-15.1	3.6	3.2	-11.1	4.9	5.1	+ 4.1
Regina	.76	.61	-19.7	3.6	3.2	-11.1	4.8	5.3	+10.4
Saskatoon	.72	.58	-19.4	3.5	3.2	- 8.6	5.0	5.4	+ 8.0
Edmonton	.74	.62	-16.2	3.7	3.3	-10.8	5.0	5.4	+ 8.0
Calgary	.70	.58	-17.1	3.4	3.3	- 2.9	5.0	5.6	+12.0
British Columbia	.70	.61	-12.9	3.4	3.2	- 5.9	4.9	5.2	+ 6.1
Vancouver	.66	.58	-12.1	3.3	3.0	- 9.1	5.0	5.2	+ 4.0
Victoria	.62	.54	-12.9	3.1	2.9	- 6.5	5.0	5.3	+ 6.0

1 The regional figures are for the entire province or region in each case, not simply for the cities shown.

2 Households and dwellings are defined as follows in the Census: *Household* - "A person or group of persons occupying one dwelling. It usually consists of a family group, with or without lodgers, employees, etc. However, it may consist of two or more families sharing a dwelling, of a group of unrelated persons, or of one person living alone." *Dwelling* - "A structurally separate set of living quarters with a private entrance from outside or from a common hallway or stairway inside the building; i.e., the entrance must not be through someone else's living quarters." Collective dwellings are not included (e.g., hotels, motels, hospitals, staff residences, institutions, military camps, work camps, and all jails and missions).

SOURCE Statistics Canada, 1961 and 1971 Census data; and estimates by the Economic Council of Canada.



Table 4-3 shows the average number of persons per room, persons per household, and rooms per dwelling (the ratio of the latter two gives the first – the crowding index) for Canada, by region and major urban area, 1961-71, and notes the percentage change in these measures over this decade. The crowding index decreased in all regions and major cities over this period, but in 1971 there were still considerable regional differences, with Ontario having the lowest index (.60 persons per room) and Quebec the highest (.70 persons per room). Over the 1961-71 period, the largest improvement in the crowding index occurred in the Prairie Region (about 17 per cent) and the smallest in the Atlantic Region (about 7 per cent).

For Canada as a whole, the decrease in the crowding index between 1961 and 1971 is a result of both the approximately 10 per cent decrease in the average number of persons per household and the almost 2 per cent increase in the average number of rooms per dwelling. In three of the five regions and most major cities, the reduction in average household size has had the greater effect on the change in the crowding index over this period. This is particularly notable in the province of Quebec and the Atlantic Region, where the average dwelling size actually decreased overall (by 1.9 and 3.4 per cent, respectively), and in the major urban centres of Quebec, where the average dwelling size either decreased or remained unchanged. In these cases, the reduction in the crowding index is entirely because of the decrease in the average number of persons per household, which is partly explained by the reduction in the birth rate and by the fact that young people and the elderly are living in separate households to a greater extent than before. In general, households increased in number relative to population over this period, and this implies a considerable additional investment in housing.

In most regions a "catch-up" process occurred in the major cities between 1961 and 1971 in that the crowding indexes for the cities with the highest indexes in a particular region in 1961 tended to decrease relative to those for the other cities in the same region over this period. For example, in the Atlantic Region, the crowding indexes for St. John's and Halifax, both of which were higher than the index for Saint John in 1961, decreased considerably more between 1961 and 1971 relative to Saint John (about 15 per cent versus 10 per cent). Still, distinct regional differences remain, with the major cities in British Columbia having among the lowest crowding indexes and the major cities in Quebec having among the highest in both 1961 and 1971.

The distribution of households by level of crowding for Canada and the regions, and for the urban and rural areas, is shown for 1971 in Table 4-4. If we regard those households with a crowding index of 1.0 or more as unacceptably crowded,<sup>7</sup> we find that a surprisingly substantial

<sup>7</sup> In other words, a family of four would live in four rooms – a kitchen, living room, bedroom for the parents, and bedroom for the two children – or less.

proportion of households in this country fall in this category. Over 21 per cent (1.3 million) of all households have one or more persons per room, with the proportion rising to over one-quarter in Quebec and the Atlantic Region. In 1961, about 31 per cent (1.4 million) of all households had one or more persons per room. Although there was considerable improvement over this decade, the proportion of overly crowded households remains high.

Looking at the percentage of households containing one or more persons per room, we observe in Table 4-4 that the rural areas in Canada

**Table 4-4**  
**Percentage Distribution of Households, by Level of Crowding,**  
**in Urban and Rural Areas, Canada, by Region, 1971**

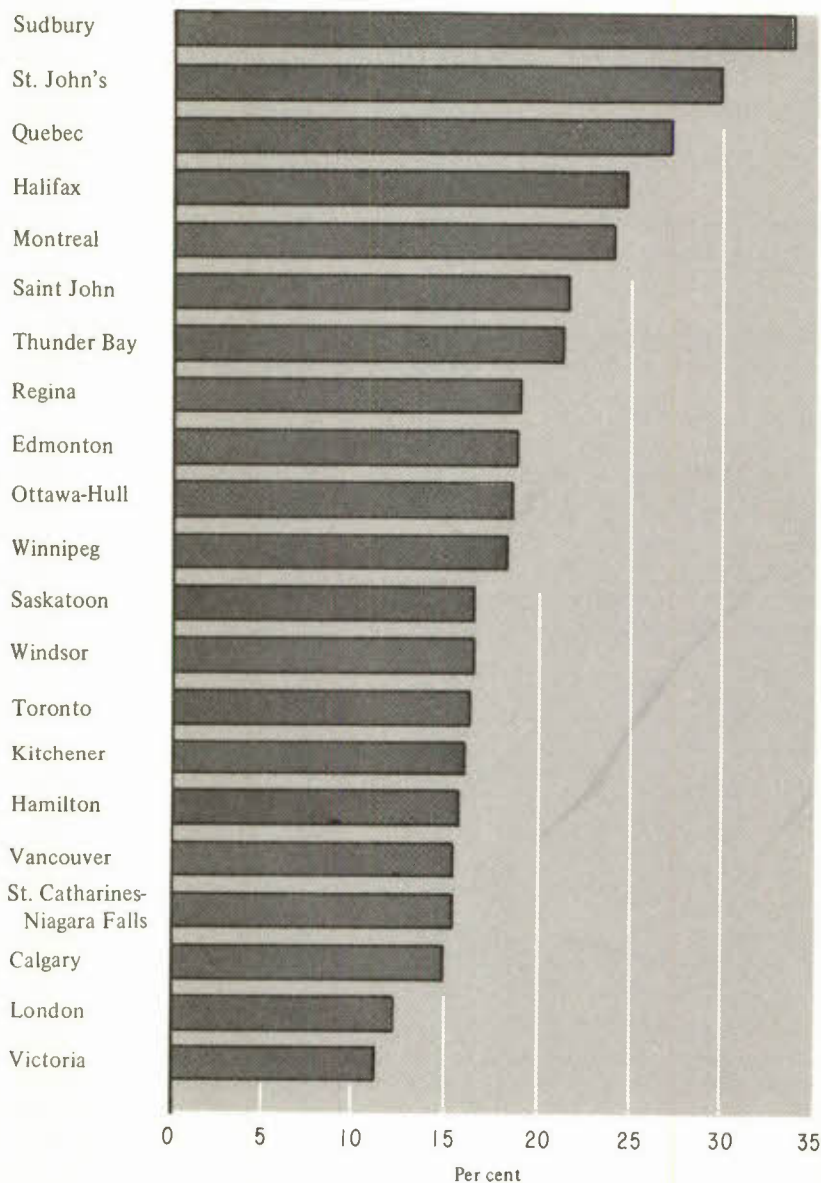
Persons per Room	Total	Urban				Rural	
		100,000 or more	30,000– 99,999	10,000– 29,999	1,000– 9,999	Nonfarm	Farm
		(Per cent)					
Canada							
.500 or less	42.6	43.3	41.2	41.4	42.8	42.5	40.0
.501 – .999	36.0	37.8	37.0	37.1	34.2	30.3	35.7
1.000 or more	21.4	18.9	21.7	21.5	23.0	27.2	24.3
Atlantic Region							
.500 or less	39.4	37.5	41.2	37.3	38.6	39.5	46.4
.501 – .999	32.9	38.5	36.0	35.9	32.9	29.3	33.5
1.000 or more	27.7	24.0	22.9	26.8	28.5	31.2	20.1
Quebec							
.500 or less	35.8	37.4	34.1	30.3	34.0	36.3	29.2
.501 – .999	37.1	37.8	37.4	39.4	36.8	32.3	38.1
1.000 or more	27.1	24.8	28.5	30.3	29.1	31.4	32.7
Ontario							
.500 or less	46.3	45.7	43.7	47.6	49.3	47.4	49.4
.501 – .999	36.7	38.3	37.5	37.1	33.6	31.6	35.6
1.000 or more	17.0	16.0	18.8	15.3	17.1	21.1	15.0
Prairie Region							
.500 or less	44.3	44.2	50.2	43.3	47.3	46.9	38.1
.501 – .999	34.9	38.4	34.7	35.3	32.4	25.6	35.0
1.000 or more	20.9	17.4	15.1	21.4	20.3	27.5	26.9
British Columbia							
.500 or less	46.8	50.1	41.9	46.4	44.4	41.7	37.0
.501 – .999	35.0	35.3	37.9	35.8	35.0	32.7	37.1
1.000 or more	18.2	14.6	20.2	17.8	20.6	25.6	25.8

NOTE Figures may not add to 100 per cent because of rounding.

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

have a higher overall proportion of crowded households than the urban areas. In addition, the percentage of crowded households tends to decrease as city size increases; this is not because the big cities have larger

**Chart 4-1**  
**Percentage of Households with One or More Persons per Room,**  
**Selected Cities, 1971**



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

dwellings, but rather because there are more small households, particularly single-person households. Table 4-4 also shows that there are considerable regional differences, with the Atlantic Region and Quebec having the highest percentage of households with one or more persons per room (28 and 27 per cent, respectively) and Ontario, the lowest (17 per cent).

There are striking intercity differences in the percentage of households having one or more persons per room (Chart 4-1). The proportions range from highs of 34.0 per cent for Sudbury and 30.0 per cent for St. John's, to 12.4 per cent for London and 11.5 per cent for Victoria.

Two further facts about the distribution of crowding are revealed by Table 4-5. First, in metropolitan and other urban areas in Canada in 1971, the crowding index is higher for rented dwellings than for owner-occupied

Table 4-5

## Crowding Index, Canada, by Urban and Major Metropolitan Area, 1971

	All Units			Urbanized Core <sup>1</sup>			Fringe Areas <sup>2</sup>		
	Total	Owned	Rented	Total	Owned	Rented	Total	Owned	Rented
Canada	.64	.63	.68						
Urban	.63	.61	.67						
500,000+	.62	.59	.66						
100,000-499,999	.61	.60	.65						
30,000-99,999	.65	.62	.69						
10,000-29,999	.65	.63	.70						
5,000-9,999	.66	.63	.72						
Under 5,000	.65	.63	.70						
Halifax	.67	.63	.72	.66	.61	.71	.73	.72	.78
Montreal	.68	.64	.70	.67	.63	.70	.71	.69	.77
Quebec	.70	.69	.72	.70	.68	.72	.76	.75	.80
Toronto	.60	.58	.64	.60	.58	.64	.60	.60	.66
Hamilton	.60	.59	.64	.60	.59	.64	.60	.60	.63
Ottawa	.63	.60	.66	.62	.60	.66	.66	.64	.70
Winnipeg	.62	.61	.63	.62	.60	.62	.70	.68	.75
Edmonton	.62	.60	.65	.61	.59	.64	.68	.68	.72
Vancouver	.58	.56	.60	.58	.56	.60	.60	.58	.68
Victoria	.54	.54	.56	.54	.53	.55	.57	.56	.62

1 The urbanized core is composed of the largest city and the municipalities that are completely or partly located within the built-up area.

2 The fringe is part of the census metropolitan area or of the census agglomeration outside the urbanized core. It corresponds to the immediate zone of influence of a multi-municipal urban centre and comprises all municipalities within a twenty-mile radius of the urbanized core.

SOURCE Statistics Canada, 1971 Census, Cat. No. 93-730, vol. 2, pt. 3 (Bulletin 2.3-5).



dwellings, since houses tend to have more rooms than apartments and most of the latter are rented. Second, the suburbs and fringe areas of the major metropolitan areas have a higher crowding index than the core areas – with the exception of Toronto and Hamilton, each of which has the same crowding index for both areas.

Table 4-6 shows the distribution of the crowding index by various socio-economic characteristics for Canada in 1961 (the 1971 material for the whole of Canada was not available at time of writing) and selected major urban areas in 1961 and 1971. For the 1961 data, the level of observation is largely the census enumeration area (containing a maximum of 200 households or 100 farms); for the 1971 data, it is the census tract (containing an average of 1,500 households in the urban areas). Consequently, the individual extremes are blurred, and the range of the crowding index for a particular socio-economic characteristic is not as great as it would have been if individual household data had been available. Nonetheless, certain facts emerge. For the major urban areas in 1961, the crowding index decreases steadily with rising household incomes – from .84 for the lowest income group to .59 for the highest. However, for these same urban areas in 1971 the variation in crowding between household income groups was less, overall, than in 1961, and the lowest and highest income households were less crowded than the other households. Over this decade the lowest income households enjoyed a greater reduction in crowding than the other households. This can be partly explained by the “undoubling” of households that occurred over this period; that is, in 1971 proportionately more young single individuals and elderly people were living separately instead of with their families than in 1961, and these people tend to have lower incomes, on average, and live in less-crowded situations.

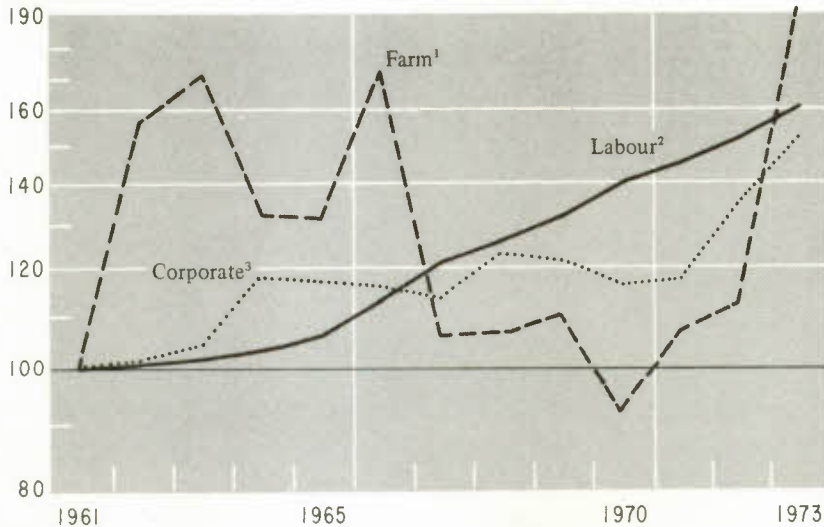
For Canada and the major urban areas, Table 4-6 shows that lower rents tend to be associated with a higher crowding index. Further, the crowding index, as expected, increases with the size of households, from an average of .61 persons per room for two or less persons to 1.14 for six or more persons for Canada in 1961. The same holds for the major urban areas in both 1961 and 1971. In fact, analysis indicates that the size of households has a greater impact on crowding than any other single factor tested, including total household income, or age of dwelling (see Appendix A for the regressions for 1971). Additionally, Table 4-6 suggests that newer dwellings tend to be more crowded than older units, although this pattern is less marked within major urban areas than on a national level. Finally, households headed by persons aged 65 or over have a lower crowding index than other households, partly because they tend to be smaller households.



Chart 2-4

## Index of Labour, Corporate, and Farm Income per Unit of Output, 1961-73

1961=100  
(ratio scale)



- 1 Farm income includes accrued net income of farm operators from farm production.
  - 2 Labour income includes wages, salaries, supplementary labour income, and military pay and allowances.
  - 3 Corporate income includes corporate profits before tax, adjusted for inventory valuation.
- SOURCE Based on data from Statistics Canada.

increase in wages, salaries, and other labour income accelerated in relation to previous years but reflected the larger rise in the number of persons employed in the economy.

Typically, increases in unit labour costs slow down in the early stage of a recovery period, as the labour market is not yet active enough and productivity gains are large; consequently, profits have a tendency to accelerate. As the expansion proceeds, productivity increases tend to diminish; labour markets become tighter; wage increases accelerate; and the growth in profits slows down. Since 1970, there has been little indication of any check in the rate of rise of unit labour costs (Chart 2-4), while the rate of productivity growth, in comparison with earlier cyclical periods, has been conspicuously slow.<sup>2</sup> Profits, however, followed a more traditional pattern (Chart 2-4). After reaching a low point during the period of contraction in 1970, growth in profits accelerated. After tax,

2 It is worth noting the close relationship between wage, profit, productivity, and price changes. As a general observation, to prevent any further acceleration in the rate of price inflation, the change in income per unit of output will need to decelerate from recent levels unless the rate of productivity growth is markedly stepped up.

and excluding inventory gains attributable to rising prices, corporate profits rose 25.1 per cent in 1973, after having increased 23.8 and 5.5 per cent in 1972 and 1971, respectively. In relation to Gross National Product, corporate profits moved from a postwar low of 9.0 per cent in 1970 to 12.0 per cent in 1973. This is a higher share of national output than the business sector held during the middle sixties, before expansion peaked.

The increase in wages, salaries, and supplementary labour income, on the other hand, was 12.5 per cent in 1973. Although this is more than the increase registered in recent years, it is fairly modest in relation to the growth in employment. Earnings per worker in 1973 rose only 7.0 per cent, the smallest year-to-year gain since 1968, and below the increase in the consumer price index (CPI). This would suggest that, for wage- and salary-earners as a whole, real income declined in 1973. However, when income is deflated according to current expenditure as in the National Accounts, wage- and salary-earners appear on average to have enjoyed a small increase in their real earnings in 1973.

The Canadian economy continued to expand rapidly in the opening months of 1974. Real GNP in the first quarter rose at an annual rate of close to 7 per cent, well above the potential rate of output in the economy. This is in sharp contrast to the situation that prevailed in the United States, where output declined over the same period. The strength of the economy in the early part of 1974 was also reflected in a strong increase in employment. By June 1974, the aggregate unemployment rate was down to 4.9 per cent of the labour force. However, some moderation from the first-quarter rate of economic expansion was generally expected for the remainder of 1974. At time of writing, estimates of likely growth in 1974 are around 4 to 5 per cent.

### ACTUAL VERSUS POTENTIAL PERFORMANCE

The Council, in its *Tenth Annual Review*, proposed an updated set of target values for fifteen selected performance indicators, covering the 1972-76 period (Table 2-1).<sup>3</sup> In most cases, these target values took the form of proposed average annual rates of change in certain key measures of activity. The targets were based on simulations of future developments aimed at reducing the overall unemployment rate to 4.5 per cent in 1976,

3 The target values proposed for the Council's performance indicators represent what is judged to be a feasible set of medium-term economic objectives, the attainment of which would constitute good overall economic performance. These targets are proposed as an aid to government and private decision-making. They are revised and updated annually. The initial set of indicator values proposed in the *Ninth Annual Review* covered the period 1973-75.

using the CANDIDE econometric model of the Canadian economy. These simulations, in turn, incorporated various forecasts of economic activity in the United States and overseas countries. By comparing actual changes in 1973 with those changes simulated earlier with the aid of our model, we were able to form some judgments about the changes, about our model, and about the attainability of the targets. In this way, we attempt to detect, at an early stage, any deviation of the actual growth of the economy from the desired medium-term time-path and also to discover why the deviation has occurred and whether our targets need modification. With this perspective in mind, we now turn to a detailed examination of the economy's performance by comparing the actual and projected results for each of the performance indicators.

**Table 2-1**  
**Performance Indicators, 1972-76**  
(Calculated in 1961 dollars)

	Proposed Average Annual Change, 1972-76
	(Per cent)
Part 1	
Gross National Expenditure	6.0
Consumer expenditure	5.9
Total investment	9.0
Investment in machinery and equipment and nonresidential construction	12.0
Residential construction	1.5
Government current expenditures	5.0
Exports of goods and services	6.0
Imports of goods and services	7.5
Part 2	
Real disposable income per capita	4.2
Total output per person employed	2.4
Output per person employed in manufacturing	4.5
Total employment	3.4
Differential between Canadian and foreign prices	0
	(Yearly averages)
Number of housing starts (thousands)	245
Rate of unemployment in 1976 (per cent)	4.5

SOURCE Economic Council of Canada, *Tenth Annual Review: Shaping the Expansion* (Ottawa: Information Canada, 1973), p. 61.

### Gross National Expenditure

The target rate of growth proposed in the *Tenth Annual Review* for real Gross National Expenditure was 6.0 per cent in 1972-76. In 1973, the realized growth rate was 6.8 per cent (Chart 2-5). Although this was higher than the average target rate to 1976, it was broadly in line with our expectations at this stage of the expansion. Thus achievement of the target rate for the period as a whole would call for a slowdown in the years 1974 to 1976 to a growth rate of about 5.7 per cent. Given 1973 performance, achievement of 6 per cent growth from now to 1976 would not be desirable because it is unlikely that it would be accompanied by an acceptable degree of absolute or relative price stability. Recent experience suggests that if 6 per cent growth were achieved, increases in participation rates and expansion of the secondary labour force, shortages of skilled workers, bottlenecks, and domestic price pressures would continue.

A moderate scaling-down of the medium-term growth target thus appears to be called for in the interests of securing a better overall balance among the competing objectives of demand management policies. The Canadian economy was evidently operating virtually at potential in 1973 and can only grow as potential itself expands, normally between 5 and 5½ per cent a year. In the short to medium term, the growth rate of plant and machinery capacity is the limiting factor in the growth of potential. This critical issue is discussed further below.

### Consumer Expenditure

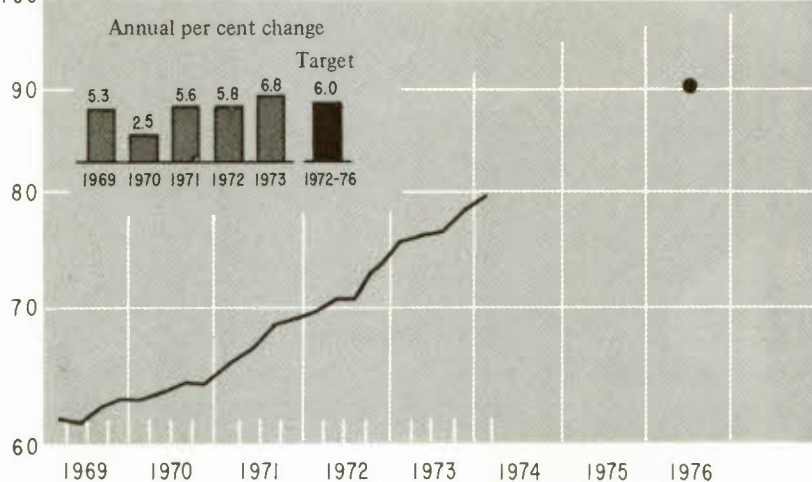
The target rate of increase for 1972-76 in real consumer expenditure was 5.9 per cent per year. The realized rate in 1973 was 8.0 per cent, about in line with our projections (Chart 2-6).

Spending on durable goods increased substantially, up 16.8 per cent in real terms over the 1972 level. This followed strong increases in 1971 and 1972 (Table 2-2). The size of the overall surge in such expenditures in the past three years was previously matched only in 1948-50 and probably reflected both the continued strong increase in personal disposable income (13.8 per cent) and the availability of credit. It may also have reflected the relatively high personal saving rates recorded in 1971 and 1972, which, we pointed out last year, could well lay the basis for substantial further increases in consumer spending.

Increases in the main categories of constant-dollar consumer spending are summarized in Table 2-2. The nondurable goods category of expenditure, in which prices rose the most, was the only one to show a smaller increase in volume in 1973.

**Chart 2-5**  
**Gross National Expenditure, 1969-76**

Billions of  
1961 dollars  
(ratio scale)  
100

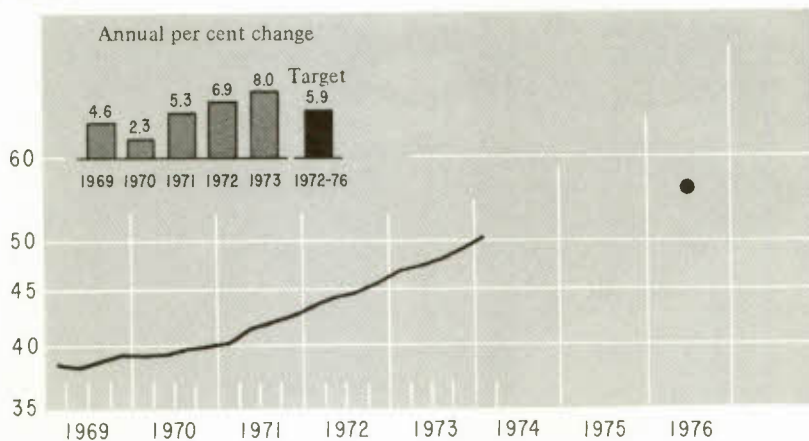


**NOTE** The black dot in the charts in this chapter represents the 1976 target level implicit in the average rate of change recommended last year.

**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Chart 2-6**  
**Consumer Expenditure, 1969-76**

Billions of  
1961 dollars  
(ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.



The recent high rates of increase in total consumer spending are compatible with the overall 1972-76 target rate of 5.9 per cent, only if average increases over the remaining three years are reduced to about 5.0 per cent per year.

**Table 2-2**  
**Increase in Real Consumer Expenditure, 1971-73**

	1971	1972	1973
	(Per cent)		
Durables	13.3	14.7	16.8
Semidurables	6.5	9.4	11.8
Nondurables	6.0	6.0	5.6
Services	1.0	3.2	4.3
Total	5.3	6.9	8.0

SOURCE Based on data from Statistics Canada.

### Total Fixed Investment

For all types of fixed investment combined, the proposed target rate was 9.0 per cent per year for the 1972-76 period. The increase actually registered in 1973 was 10.4 per cent (Chart 2-7). This was somewhat higher than expected for 1973, but mainly because housing, with continued easy credit and exceptionally heavy demand, was considerably stronger than projected. The performance of the various components of fixed investment over the past five years is summarized in Table 2-3.

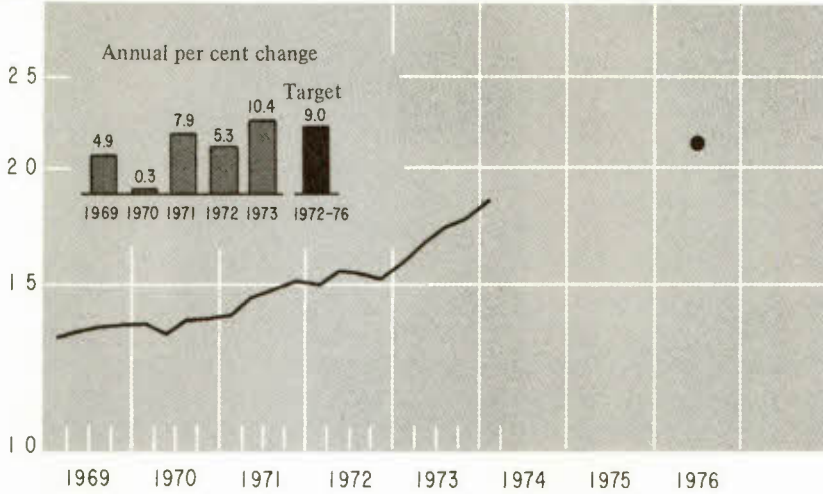
**Table 2-3**  
**Change in Total Real Fixed Investment, by Component, 1969-73**

	1969	1970	1971	1972	1973
	(Per cent)				
Government gross fixed capital formation	-2.4	-0.6	12.8	1.1	4.4
Residential construction	12.8	-11.0	18.6	10.9	12.8
Nonresidential construction	-0.6	7.3	4.2	-1.9	7.9
Machinery and equipment	9.1	2.3	2.6	10.3	13.9
Total	4.9	0.3	7.9	5.3	10.4

SOURCE Based on data from Statistics Canada.

**Chart 2-7**  
**Total Fixed Investment, 1969-76**

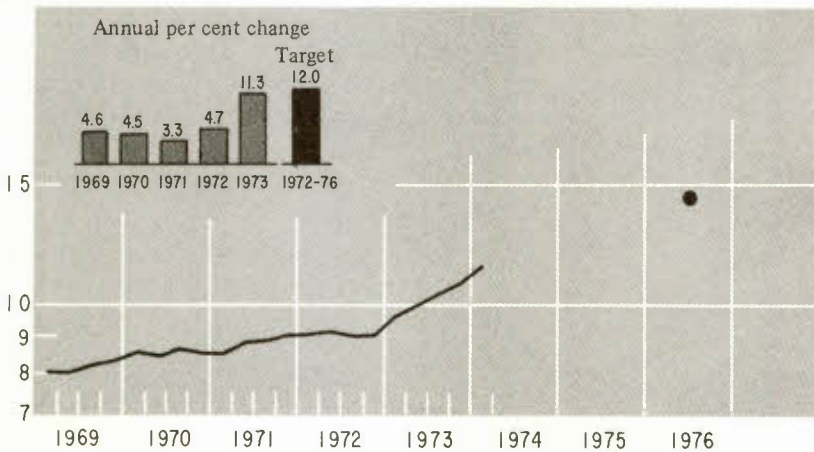
Billions of  
 1961 dollars  
 (ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Chart 2-8**  
**Investment in Machinery and Equipment and  
 Nonresidential Construction, 1969-76**

Billions of  
 1961 dollars  
 (ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

The target rate of 9.0 per cent for total fixed investment is, of course, compatible with a considerable degree of continuing strength in 1974 and the following years, especially in business investment.

### **Business Fixed Investment**

The target for business fixed investment proposed for 1972-76 was an average increase of 12.0 per cent. This very high rate reflected the need to add to capacity in a wide range of industries in order to produce the high target output levels. The actual increase realized in 1973 was 11.3 per cent (Chart 2-8), slightly above our expectations for that year. Our underlying work suggested that there could be rising rates of increase in real demand for several years beyond 1973. Among the components, business nonresidential construction was not as strong as expected. Spending on machinery and equipment, on the other hand, was significantly higher. This divergence may be explained, in part, by the tax incentives that came into effect early in 1973, which could have had a quick impact on machinery and equipment purchases. Continued sluggishness in nonresidential construction could also well reflect the lagged effects of the uncertainties that surrounded investment decision-making through 1971 and 1972, as well as selective shortages of labour and materials. The recent growth record of these two components of business fixed investment is provided in Table 2-3.

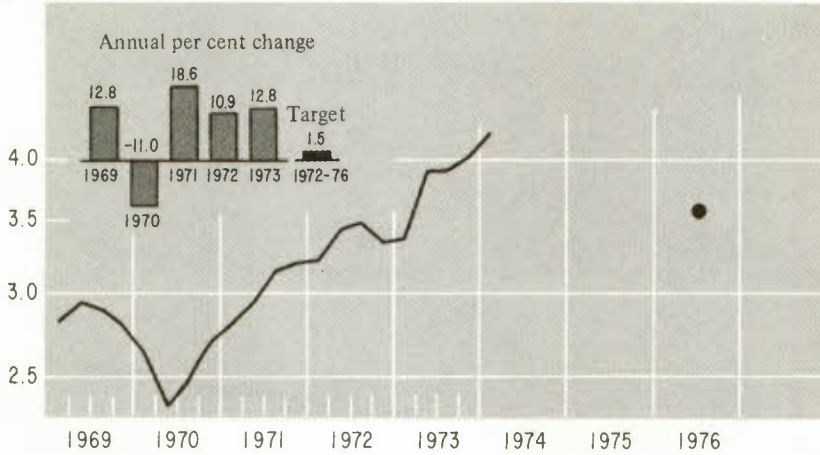
The insufficient growth of nonresidential construction in the past several years suggests the possibility of further substantial increases, involving the necessity of some "catching-up" in the years ahead. It is worth noting that increases in the mid-1960s, following a surge in output growth similar to that recently experienced, were 16.2 per cent, 10.5 per cent, and 14.5 per cent in 1964, 1965, and 1966, respectively. In summary, business fixed investment in total is now increasing at close to the expected rate, and the targets proposed continue to appear realistic and appropriate. Of course, any scaling-down of the target for aggregate real GNP growth would, as a result of the 1973 performance, have some impact on the investment indicators, but continuing strong increases would nonetheless still need to be forthcoming.

### **Residential Construction and Housing Starts**

The performance indicators for housing called for a yearly average of 245,000 starts in 1972-76 and an average increase of 1.5 per cent per annum in real residential construction. In 1973, the increase in real residential construction expenditure was 12.8 per cent, and there were 268.5 thousand housing starts (Charts 2-9 and 2-10). This exceptionally

**Chart 2-9**  
**Residential Construction, 1969-76**

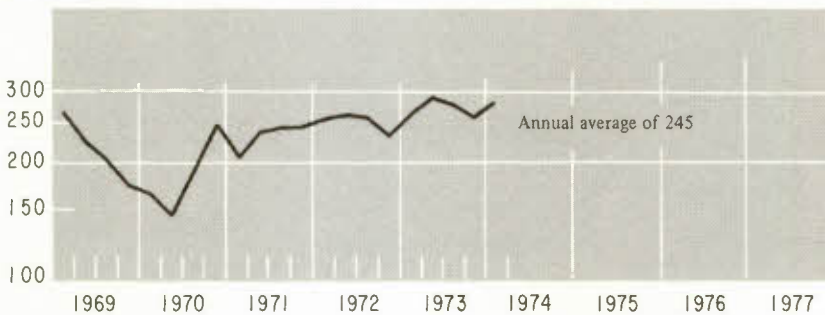
Billions of  
1961 dollars  
(ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Chart 2-10**  
**Number of Housing Starts, 1969-76**

Thousands of units  
(ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

strong performance was higher than we had expected on the basis of the results produced by the CANDIDE model, which takes into account only factors traditionally influencing housing demand.<sup>4</sup> Typically, housing activity is highly variable from one year to the next, as the charts indicate. The marked overachievement of housing demand, like other divergences between simulated and actual values, points to the presence of unusual elements in the recent situation.

Indeed, there appears to have been a high rate of nonfamily household formation in 1973, possibly related to the extensive growth in total employment and the consequent rise in internal migration. Net family formation is estimated to have increased by 123,000, less than half the level of housing starts and completions.

The continued easy availability of mortgage financing has no doubt facilitated the translation of demand for housing, but other factors must have contributed to this increasing demand and to sharply rising prices for accommodation. The tax reform legislation of 1970 accorded a preferred status to homeowners by exempting them from taxation on capital gains related to their principal residence. The taxation of all other forms of nominal capital gain resulting from the tax reform has altered the former neutrality of choice, for the mass of small investors, between owner-occupied housing and other forms of personal investment.<sup>5</sup> Also, continued increases in the price of housing, reflecting the relative shortage of serviced land, as well as rapidly rising material and labour costs, have made housing a hedge against inflation. Other vehicles for personal investment, which could protect an individual's real capital to some extent from erosion during periods of inflation, have become relatively less attractive, since half of these nominal gains are taxable. Of course, not all nominal or real gains on housing are nontaxable, and it must be recognized that many other factors have been involved in stimulating the demand for housing, including speculation.

The presence of inflation-induced distortions of demand makes the task of setting realizable medium-term economic objectives particularly

4 This is particularly so, when the rising number of mobile homes is taken into account, which the CANDIDE model does not do specifically. Statistics Canada estimates indicate that the numbers of mobile homes entering into use in 1972 and 1973 were 19,883 and 24,509, respectively. The estimated 24,509 mobile homes set up in 1973 represented roughly 19 per cent of the 131,552 single-detached-dwelling starts (exclusive of mobile homes) recorded in 1973.

5 By the same token, it has no doubt contributed to the diminished interest shown in other areas of investment, such as the market for common stocks, and hence to the lowering of price/earnings ratios. More generally, in today's environment of inflation and the taxation of nominal capital gains and interest receipts, the incentives to spending are high and the rewards to saving are low. This situation is a paradoxical one for Canada, particularly at a time when nationalistic sentiment is strong and the desire both to finance major investment projects in Canada and to attain a higher degree of domestic ownership is widespread.



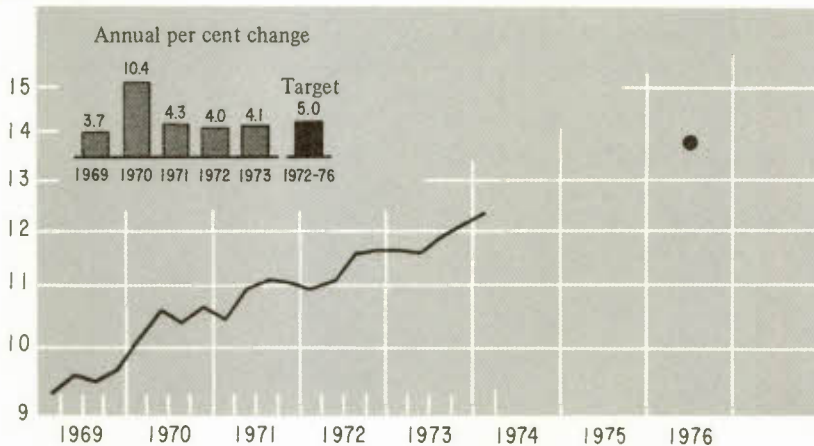
difficult.<sup>6</sup> It is not clear, in this situation, whether the higher-than-expected number of starts is a purely temporary development or not. For the time being, we do not propose any modification of our target on this account.

### Government Current Expenditures

The proposed target rate of growth of government current expenditures for 1972-76 was an average of 5.0 per cent in constant dollars. Actual spending in 1973 was 4.1 per cent (Chart 2-11). Only those government

Chart 2-11  
Government Current Expenditures, 1969-76

Billions of  
1961 dollars  
(ratio scale)



SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

expenditures often referred to as operating expenditures are included in this item: depreciation charges, purchases of goods and services from the private sector, wage and salary costs, and defence expenditures. Since the indicator is presented in constant-dollar terms, it actually measures the volume of government current spending. In the case of wages and salaries, the constant-dollar series measures the "volume" of labour employed

6 Since there is no single cause underlying the massive price increases in housing, there is no single remedy. A number of steps already taken at federal, provincial, and local levels may be effective in the coming months and years. Among factors that could lower the relative price of housing in the medium and longer term are a lower realized and anticipated future general rate of inflation, and the availability of comparable investment vehicles to protect real assets of individuals from erosion by inflation. It is worth noting that the relative price of housing should not be expected to rise indefinitely, but only to the extent necessary to establish a new equilibrium, given the rate of inflation, between housing and other assets.

(number of persons and man-hours worked) by the public sector since, in national accounting practice, constant productivity on the part of public employees is assumed. This "index" of labour input accounts for more than 50 per cent of total government current expenditures and for close to 60 per cent of nondefence expenditures, and therefore plays a preponderant role in determining the pace of total government current spending.

Overall, this 4.1 per cent increase in government current expenditures is lower than the average growth proposed for the period from 1972 to 1976, but it is broadly in line with our expectations, given the cyclical setting in which the Canadian economy has recently been operating. Typically, government current expenditures have shown a tendency to follow, with some delay, the course of the overall economy. Since, in 1972, the economy operated on balance below the target rate proposed for real GNP growth, it is not surprising to find government current expenditures in 1973 growing at a slower pace than the target rate for 1972-76. Given the strong performance of the Canadian economy in 1973, our expectation is that government current spending will show higher growth in 1974.

### Government Transfer Payments to Persons

Government transfer payments to persons were not part of the performance indicator framework proposed in the *Ninth Annual Review*. However, after careful examination of the macro-economic implications of continued rapid increases in transfer payments, the Council recommended in its *Tenth Annual Review* that increases of such transfers not exceed an average yearly rate of 11.2 per cent in the 1972-76 period. Actual increases since 1969 are shown in Table 2-4.

Table 2-4  
Increase in Transfer Payments to Persons, 1969-73

1969	1970	1971	1972	1973
(Per cent)				
12.6	13.4	18.3	19.7	13.0

SOURCE Based on data from Statistics Canada.

After increasing sharply in 1971 and 1972 following the extension of major federal transfer programs, government transfer payments to persons increased slightly faster than the recommended rate in 1973. In fact, the rate of increase in transfer payments in 1973 was slightly lower than that indicated for that year in the Council's projections set out in the *Tenth*

*Annual Review.* While federal transfers have grown in line with the projected rate, provincial and municipal transfers seem to have been significantly lower. Because of the unavailability of more disaggregated data at time of writing, it was impossible to determine in which area our projections were a little high.

Looking to the future, it would appear that the recommended rate has become almost impossible to achieve because of the rapid intensification of inflationary pressure. The Council has already expressed its awareness that, because of previous commitments, notably to family allowances, realization of the recommendation meant reduction in the rate of increase of payments under other social programs. With almost full indexing of federal and Quebec programs, in a much more inflationary environment, such reductions are not expected now unless inflation itself is contained.<sup>7</sup> This conclusion in no way modifies the basic judgment underlying our recommendation that gradualism in the rate of increase of transfer payments seems appropriate in a period of strongly rising capital expenditures and a high rate of inflation, so as not to add further impetus to wage and salary demands arising from stepped-up attempts by those adversely affected by taxes and inflation to preserve their after-tax real income.

### Exports of Goods and Services

For exports of goods and services, the target for the performance indicator called for an average rate of growth of 6 per cent in 1972-76. The actual rate realized in 1973 was 8.3 per cent (Chart 2-12.)

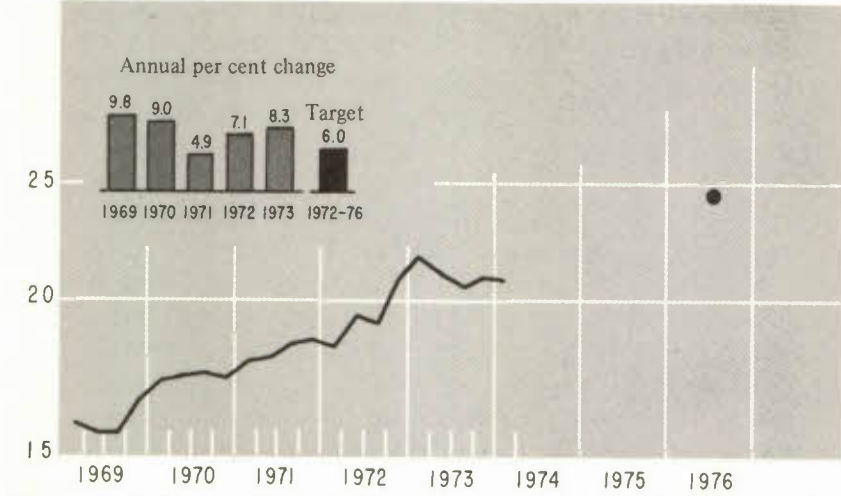
Although this performance exceeds the average target rate to 1976, the underlying pattern we had envisaged was of a stronger increase in 1973, followed by considerably reduced rates of increase thereafter. Grain and other food shipments were significantly lower in the last few months of 1973 than expected because of strikes, shortages of boxcars and, later, the severity of weather conditions in the West. Exports of other commodities were also affected in various ways. In the case of oil, gas, and sulphur, export licensing and the diversion of oil shipments to Eastern Canada caused some shortfall from anticipated export levels. Strikes, transportation difficulties, and capacity shortages affected exports of lumber, newsprint, iron and steel, and nonferrous metals. Canada's ability to recapture some of the losses of potential exports and to achieve the suggested export figures depends critically on the solution of present inland transportation, ocean shipping, and capacity difficulties. Over the

7 Our recommendation was clearly intended to be interpreted in context. The recommended rate of growth of transfer payments to persons was 11 per cent, in line with the growth rate projected for current-dollar GNP and total government expenditure (Table 3-3, p. 69, and also p. 71 of the *Tenth Annual Review*).

**Chart 2-12**

**Exports of Goods and Services, 1969-76**

Billions of  
1961 dollars  
(ratio scale)

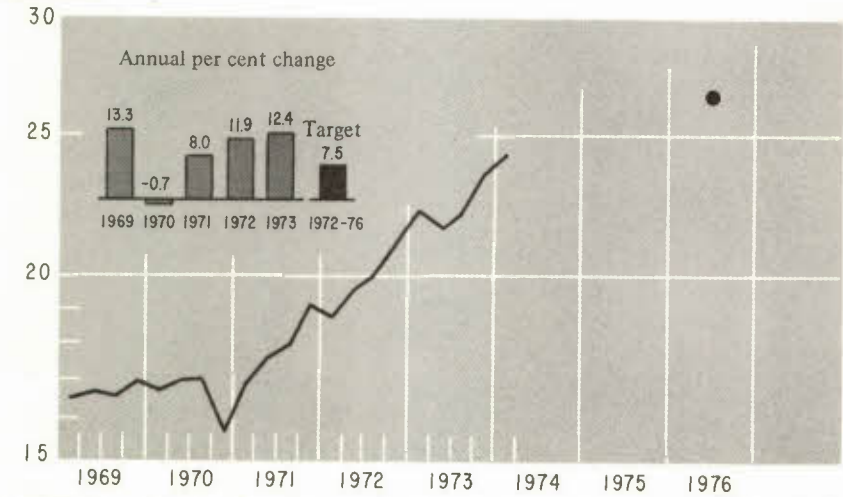


**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Chart 2-13**

**Imports of Goods and Services, 1969-76**

Billions of  
1961 dollars  
(ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

longer term, reductions in Canadian and foreign trade barriers would be necessary to achieve substantial progress in Canadian exports.<sup>8</sup>

### Imports of Goods and Services

The indicator for imports called for a 1972-76 average target rate of growth of 7.5 per cent; the rate realized in 1973 was 12.4 per cent (Chart 2-13).

Such a large increase was anticipated for this particular year, in view of the strength of the Canadian economy as a whole and the extent of expenditures on machinery and equipment in particular. In fact, the recorded increase was only slightly above our expectations.

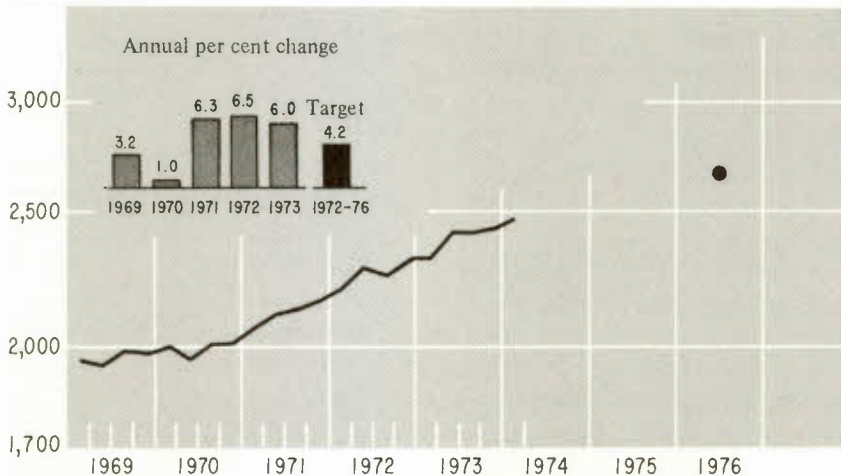
### Real Disposable Income per Capita

While the 1972-76 average growth proposed for this indicator was 4.2 per cent, the increase actually recorded in 1973 was 6.0 per cent (Chart 2-14). This percentage rise was significantly above what we anticipated for 1973. It is therefore useful to look at the components of this important measure in more detail (Table 2-5).

Chart 2-14

#### Real Disposable Income per Capita, 1969-76

1961 dollars  
(ratio scale)



SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

<sup>8</sup> For elaboration, the reader is referred to a forthcoming Council study on Canadian Commercial Policy.



**Table 2-5**  
**Change in Real Disposable Income per Capita,**  
**by Component, 1969-73**

	1969	1970	1971	1972	1973
	(Per cent)				
Wages, salaries, and supplementary labour income	12.0	8.5	9.9	11.0	12.5
Other personal income <sup>1</sup>	7.0	2.9	8.4	11.0	20.1
Transfer payments to persons	12.6	13.4	18.3	19.7	13.0
Personal income	11.0	7.8	10.5	12.0	14.0
Current transfers to governments <sup>2</sup>	23.0	15.9	12.1	11.0	14.7
(Income taxes included in current transfers)	(26.0)	(18.0)	(15.1)	(12.5)	(16.6)
Personal disposable income	8.7	6.1	10.1	12.2	13.8
Personal expenditure deflator	3.9	3.6	2.4	4.1	6.1
Real personal disposable income	4.7	2.4	7.6	7.8	7.3
Population	1.4	1.4	1.3	1.2	1.3
Real disposable income per capita	3.2	1.0	6.3	6.5	6.0

1 Includes military pay and allowances; net income received by farmers from farming; interest, dividends, and miscellaneous investment income; current transfers from corporations; current transfers from nonresidents; capital assistance; and net income of nonfarm unincorporated business.

2 Includes income taxes, succession duties and estate taxes, employer and employee contributions to social assistance, and government pension funds plus other current transfers.

SOURCE Based on data from Statistics Canada.

It is apparent that one of the main reasons for the strong growth in real disposable income per capita was the rise in the "other personal income" category, which climbed by 20.1 per cent in 1973. Wages, salaries, and supplementary labour income rose at a higher rate than in 1972, but this acceleration, as noted earlier, represented an increase in the number of employees rather than in the amount received per employee. On the latter basis, the rise in 1973 was 7.0 per cent compared with 7.6 per cent in 1972.

Outstanding increases in personal income are evident in the farm and investment categories (Table 2-6). Farmers have benefited substantially from higher domestic and world prices, particularly for grains, after six years of relatively depressed income, as shown in Chart 2-4. In the simulations presented in Appendix B we have tried to allow, in an approximate way, for the effects on farm incomes of higher world prices for agricultural products during and following the new target period 1973-77.

Real disposable income per capita is the broadest possible measure of the standard of living of a population. As the expression itself indicates, it is income after tax and adjusted for price changes. A 6 per cent annual increase in this indicator is substantial by any standard and well above

**Table 2-6**  
**Increase in Personal Income, by Component, 1972-73**

	1972	1973	Per Cent Change
(Millions of current dollars)			
Wages, salaries, and supplementary labour income	56,976	64,108	12.5
Military pay and allowances	979	1,039	6.1
Net income received by farm operators from farm products	1,597	2,972	86.1
Net income of nonfarm unincorporated business (including rent)	6,359	6,803	7.0
Interest, dividends, and miscellaneous investment income	6,254	7,467	19.4
Transfer payments to persons	9,891	11,180	13.0
Other transfers	384	423	10.2
Personal income	82,440	93,992	14.0

SOURCE Based on data from Statistics Canada.

what the Canadian economy can generate in the medium and long term. The fact that the 6 per cent increase in 1973 followed two successive years of similar advance is worth noting.

### Total Output per Person Employed

The indicator for output per employed person called for an average 2.4 per cent increase per year in 1972-76, in line with long-run experience in the postwar years. The actual increase recorded in 1973 was 1.6 per cent (Chart 2-15). While significant upward revisions to first estimates of output have taken place in the past, it would appear that during the last few years there has been a marked slowdown in the growth of output per person employed (Table 2-7).

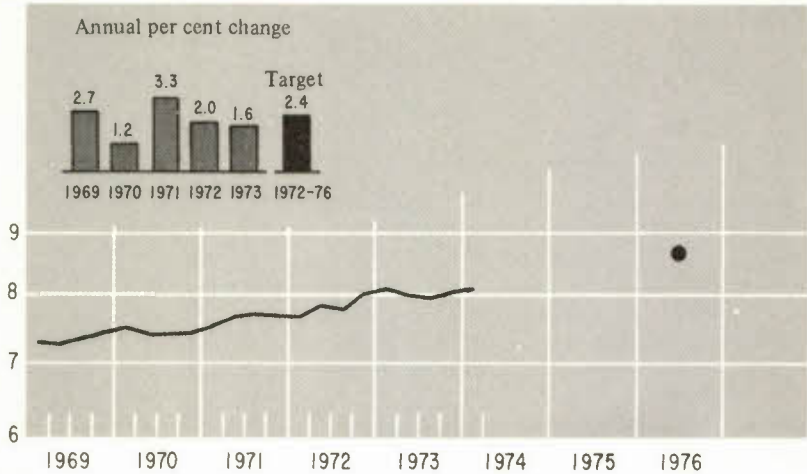
**Table 2-7**  
**Change in Output per Person Employed, Total Economy, 1961-73**

1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
(Per Cent)												
0.5	4.1	3.3	3.3	3.2	2.9	0.2	3.6	2.7	1.2	3.3	2.0	1.6

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Chart 2-15**  
**Output per Person Employed, 1969-76**

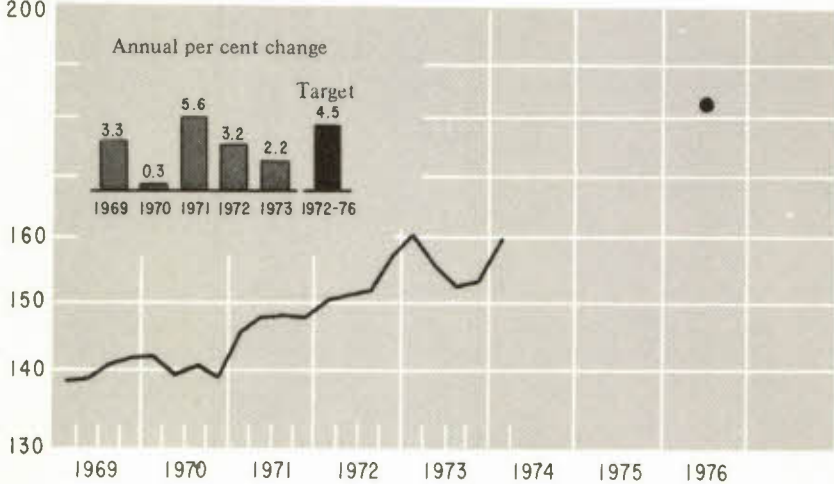
Thousands of  
 1961 dollars  
 (ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Chart 2-16**  
**Index of Output per Person Employed in Manufacturing, 1969-76**

1961=100  
 (ratio scale)  
 200



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

Rates of increase since the 1970 trough compare unfavourably with those experienced following the 1961 trough or even those following the general slowdown in the economy in 1967. The measured 1973 increase is particularly small when account is taken of the continued large expansion both of real demand for consumer durables and real purchases of machinery and equipment, and the consequent strong growth (8.2 per cent) in manufacturing output. The pattern of the productivity slowdown is somewhat different when looked at in terms of rates of increase in output per man-hour, but the poorer performance in the current expansion is again evident. It is clear that underlying the slowdown in the rate of productivity advance have been the rapid growth in employment of people in the low-wage, low-productivity categories and the excessive rates of utilization of capital stocks, with bottlenecks emerging in many areas, including a number of manufacturing industries. However, it is not clear whether these factors alone explain the moderation in productivity advances. This phenomenon of slowdown is apparent, as Chapter 8 indicates, in most sectors of industry.

We cannot be sure of the causes of this slowdown, and we cannot determine the extent to which it may be partly illusory, temporary, or permanent. This is clearly an area in which a great deal more information is needed. It is not attainable from our model, and we propose to seek it through further specific research and other sources, such as the National Economic Conference.

### **Output per Person Employed in Manufacturing**

The target rate of growth for output per person employed in manufacturing was an average of 4.5 per cent in 1972-76, while the actual increase recorded in 1973 was only 2.2 per cent (Chart 2-16). This performance was not only poor but was also substantially below what might have been expected in view of the strong 1973 increase in manufacturing output.<sup>9</sup>

9 In comparison with other countries, productivity, measured in terms of output per man-hour, has risen much more slowly in North America than in the major countries of the European Economic Community or Japan. Between 1966 and 1973, there was an average annual increase in manufacturing output of only 3.3 per cent in the United States and 3.8 per cent in Canada. The corresponding figures for the other countries were: United Kingdom, 4.6; France, 7.2; Germany, 6.2; and Japan, 12.7 (based on data from Statistics Canada and the National Institute of Economic and Social Research). In interpreting these data, however, attention should be drawn to the fact that productivity is a many-sided concept and that faster rates of growth in productivity in one country than another can reflect a large variety of different factors relating to the efficiency with which the factors are used or combined or to improvements in their quality. For example, the capacity to achieve economies of scale and specialization may well depend upon the size of a country's home market or its ability to penetrate export markets. In addition, the speed with which the skill level of the work force is upgraded or the quality and efficiency of the capital stock raised may also be among the factors contributing to differing rates of productivity growth among countries.



Very high rates of capacity utilization or even capacity shortages were experienced in a wide range of Canadian manufacturing industries: textiles, paper, printing and publishing, petroleum and coal products, chemicals, wood, furniture, metal fabricating, machinery, transportation equipment, electrical products, iron and steel, and nonferrous metals. The high rates of increase in real investment in manufacturing in 1973 indicate a strong response to the pressure of demand on capacity, to recent high profits and, possibly, to the manufacturing tax incentives. This expansion of capacity promises to alleviate shortages, and an improvement in productivity over the next few years is expected as a result. However, the 4.5 per cent average productivity growth target could well be somewhat overoptimistic as a medium-term objective under present circumstances. We, therefore, propose later a somewhat lower figure for the 1973-77 period but remain concerned at the poor performance in this sector and in the economy as a whole.

### **Employment**

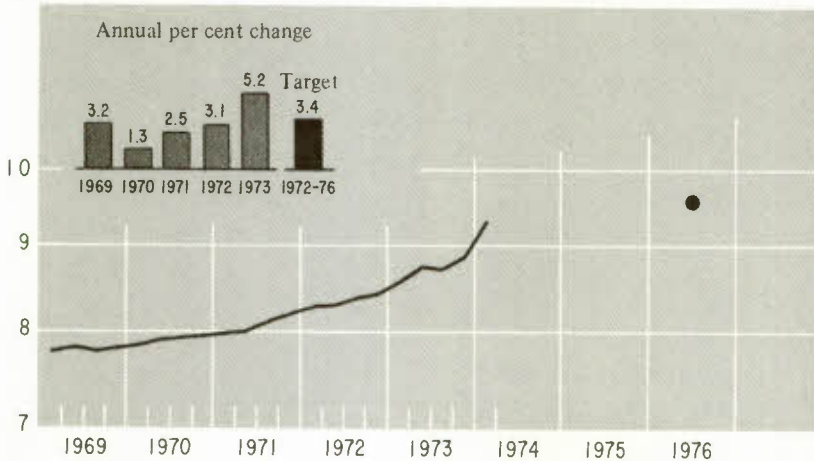
The actual increase in employment in 1973 was a phenomenal 5.2 per cent (Chart 2-17). Although our work indicated that a large increase would be forthcoming, the size of the gain actually realized was still substantially in excess of what we had anticipated. The overachievement was associated with an unexpected jump in the labour force participation rate and the disappointing improvement of labour productivity. Here again, the divergence between the projected and the actual increase seems to point to the presence of abnormal forces. The CANDIDE model used in the simulations allows for changes in participation rates as the unemployment rate declines. The understatement of the rise in the participation rate thus may be partially related to the "stickiness" of the unemployment rate. In 1973, despite the large number of people classified as unemployed, the labour market appears to have been generally tight; increased employment was achieved mainly by drawing additional people into the labour force and not by thinning the ranks of the unemployed.

Of the total increase in the number of persons employed, the largest single increment – about 110,000 people – went into manufacturing, continuing the trend begun in 1972 (Table 2-8). The large increases in employment in manufacturing, trade, services, and construction no doubt reflect, to an important extent, the stimulus provided by the rise in consumer expenditures on durable goods and housing, and in the volume of machinery and equipment purchases.



**Chart 2-17**  
**Total Employment, 1969-76**

Millions of  
persons  
(ratio scale)



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Table 2-8**  
**Change in Employment, by Industry, as a Percentage of Total Change in Employment, 1970-73**

	1970-71	1971-72	1972-73
	(Per cent)		
Agriculture	-0.5	-11.6	-3.3
Forestry	0.0	-0.4	2.1
Fishing	1.0	0.0	0.7
Mining, quarrying, and oil wells	2.0	-2.0	-0.2
Manufacturing	2.5	24.8	25.8
Construction	12.0	2.4	11.2
Utilities	-1.0	2.4	1.4
Transportation, storage, and communications	6.0	8.8	8.6
Trade	5.0	32.0	20.5
Finance, insurance, and real estate	10.0	0.0	5.8
Community, business, and personal services	46.5	30.4	20.9
Public administration and defence	17.0	13.2	6.7
Total	100.0	100.0	100.0

**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

Employment for young people and women increased the most rapidly. The largest absolute increase, however, was recorded by prime-age men (126,000) – a group that in the past contributed more than average increments to productivity (Table 2-9).

**Table 2-9**  
**Increase in Employment, by Age and Sex, 1973**

		Thousands	Per Cent	Percentage Distribution of Increase
Men	14-19	59.9	13.0	13.9
	20-24	45.2	6.2	10.5
	25-54	125.7	3.6	29.3
	55+	4.0	0.5	0.9
Women	14-19	36.8	10.2	8.6
	20-24	32.7	6.0	7.6
	25-44	78.6	7.0	18.3
	45+	48.3	6.3	11.2
Total		429.4	5.2	100.0

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

The abnormal 1973 increases in participation rates and employment were evidently the result of the exceptional demand/supply conditions of 1973. They are unlikely to persist in a substantially less expansive environment.

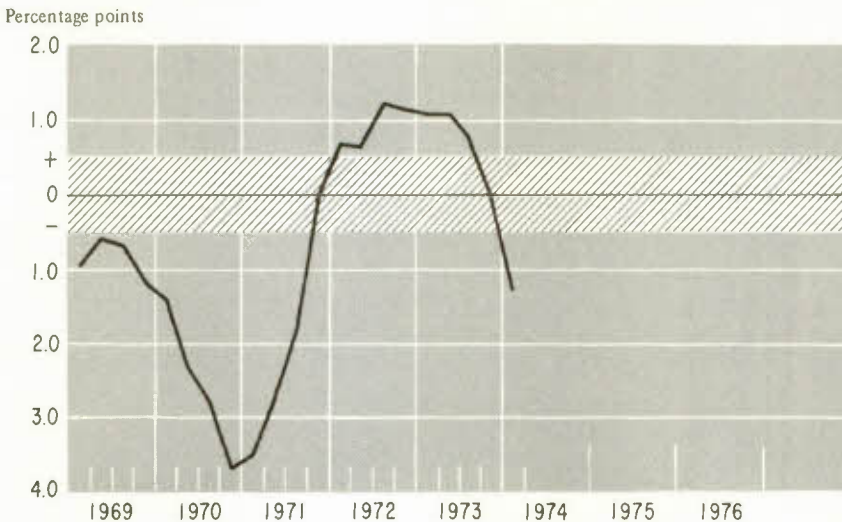
### Prices

In the *Tenth Annual Review*, we proposed a new price indicator, consisting of the difference between price changes in Canada and price changes in the main industrial countries, and we gave it a zero value, plus or minus half a percentage point. The recent pattern of this indicator is shown in Chart 2-18, which also contains a more technical definition.

The changes in the consumer price index experienced since the end of 1971 are clearly unsatisfactory. These changes have, of course, been high in both relative and absolute terms. In fact, all recorded values for the indicator during the period extending to the end of 1973 have exceeded zero, and we must look back to November 1971 before a period can be found in which the Canadian economy was inflating at a lower rate than

Chart 2-18

**Differential Rates of Price Change between Canada and  
Major Industrial Countries, 1969-73**



**NOTE** This chart records the absolute difference between year-to-year changes in the Canadian consumer price index and year-to-year changes in the weighted average index of the consumer price indexes of the principal OECD countries: United States, United Kingdom, West Germany, France, Japan, and Italy. The weights used for the latter are the proportions that each country's total bilateral import and export trade with Canada represents of the total import and export trade of the six countries combined with Canada. The trade weights are based on 1968-71 data.

**SOURCE** OECD, *Main Economic Indicators*, various issues, and estimates by the Economic Council of Canada.

the average for our principal trading partners. Further, until August 1973, the rate of increase in the CPI was substantially above the upper bound of the acceptable zone proposed for use with the indicator in the *Tenth Annual Review*. From mid-1972 to mid-1973, the rate of increase in the CPI was, on average, over one percentage point above that being experienced elsewhere, even though all of our trading partners suffered from markedly accelerating price trends (Chapter 7). The annual year-over-year change in the CPI rose from a rate of 5 per cent in December 1971 to more than 9 per cent in December 1973.

Towards the end of 1973, as rates of price increases rose elsewhere, our rate of inflation became more comparable with that of other economies. Canada's price performance continued to improve relative to that of other countries in the first quarter of 1974; our CPI increased about one percentage point less rapidly than that of our principal trading partners. This was not, however, attributable to lower rates of price increases in Canada but to marked price acceleration in Japan and the United States,

partly because of the crisis in commodity prices, in the case of the former, and the release of latent inflationary forces as the control program was weakened, in the case of the latter.

In the case of this indicator, we do not feel at this time that it would be appropriate to modify our proposed target value in any way, save perhaps to allow ourselves a wider margin within which to perform better than other countries in the current, very inflationary environment. Canadian price performance has clearly been unsatisfactory for some time, and it is equally obvious that domestic pressures have contributed to this. As in the United States, the strong monetary and fiscal stimuli applied in Canada since 1970 produced an expansion in the economy that created bottlenecks. These arose, in part, from the effects of the slowdown in 1970 – itself induced by policies of restraint in both countries. Future demand policies geared to the containment of inflation must obviously be longer-term in conception and execution. A gratifying development is an indication of growing awareness of this need among monetary authorities, including the Bank of Canada, whose Governor favoured such an approach in his latest report.<sup>10</sup>

There is little doubt that domestic demand in 1973 was excessive when judged by any criterion other than the size of the aggregate unemployment rate. Exchange rate objectives obviously contributed to the strong monetary growth that helped to bring about these results. Although we have explicitly recognized the important constraints that exchange rate considerations impose on the conduct of monetary policy, some upward flexibility of the exchange rate should be accepted in the interests of controlling domestic inflation. These observations are particularly relevant now when Canada could be confronting longer-term shifts in her terms of trade and large-scale investment inflows, both of which would tend to strengthen the exchange rate for some time. Attempts to offset these longer-term influences on the exchange rate by expanding the domestic money supply could lead to an acceleration of present domestic inflationary tendencies. At a more fundamental level, it is evident that a more concerted attempt is required by all industrial countries to control the inflationary growth of demand and, more particularly, the monetary base of such demand growth. There are indications of renewed determination among the OECD countries to co-operate in moderating future inflationary pressures. However, it appears unlikely that reasonable price stability can be restored quickly. Some years of *gradually* moderating growth of monetary demand will probably be necessary. On the fiscal side, the *Tenth Annual Review* indicated that a small budget surplus for the combined government sector appeared appropriate at that time.

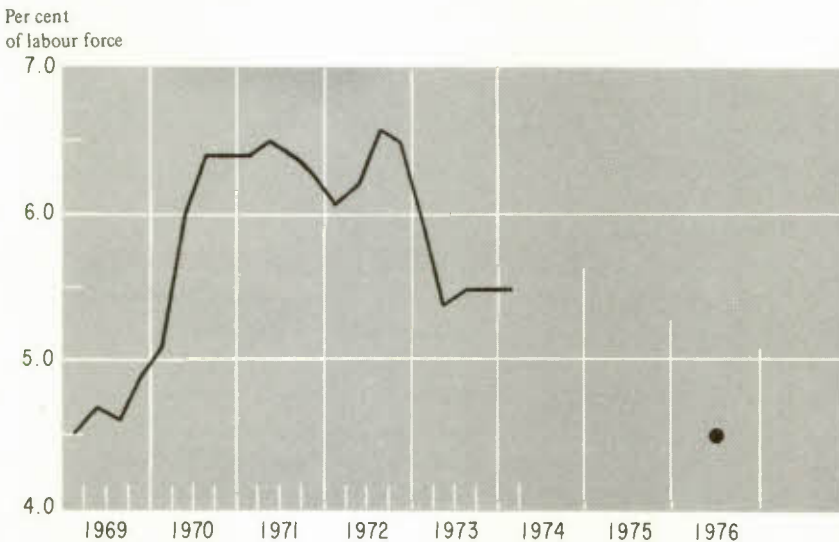
10 Bank of Canada, *Annual Report* of the Governor to the Minister of Finance, for the year 1973.

Data now available show that the government sector moved towards such a position in late 1973 and early 1974.

### The Rate of Unemployment

The unemployment target proposed for 1975 and 1976 in the *Tenth Annual Review* was 4.5 per cent. The actual average rate of unemployment in 1973 was 5.6 per cent, down from 6.3 per cent in 1972 (Chart 2-19).

Chart 2-19  
Aggregate Rate of Unemployment, 1969-76



SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

For men aged 25 to 54, the rate of unemployment was down to 4.1 per cent for the year, close to the level recorded in 1969. Despite this, the aggregate rate, at 5.6 per cent, was nearly a full percentage point above the 1969 level of 4.7 per cent. Thus unemployment rates for other than prime-age males have risen sharply since 1969, as shown in Table 2-10.<sup>11</sup> Even with a 5.2 per cent rise in employment, the aggregate unemployment rate

11 It is these increases in unemployment rates *within* the young male and female categories that explain the shift in the aggregate rate. Although there have also been increases in the proportions of these groups in the labour force, this development, by itself, does not exert much effect on the aggregate rate. If, for example, the aggregate unemployment rate is re-estimated by applying 1961 labour force weights to the age/sex specific unemployment rates shown in Table 2-10, the resulting figure is 5.4 per cent compared with the 5.6 per cent rate actually registered.



**Table 2-10**  
**Unemployment Rate, by Age and Sex, 1961-73**

	Total	Men 14-19	Men 20-24	Men 25-54	Men 55+	Women 14-19	Women 20-24	Women 25-44	Women 45+
					(Per cent)				
1961	7.1	16.4	11.8	7.2	7.5	8.6	4.2	2.6	2.3
1962	5.9	14.4	10.0	5.6	6.5	7.9	3.7	2.4	2.0
1963	5.5	14.0	9.6	5.1	5.8	7.7	4.1	2.2	2.1
1964	4.7	12.3	7.9	4.1	4.9	7.6	3.3	2.0	2.1
1965	3.9	10.2	5.7	3.4	4.5	6.9	3.1	1.9	1.5
1966	3.6	9.7	5.3	3.0	4.3	6.4	2.5	1.9	1.6
1967	4.1	10.9	6.1	3.5	4.4	7.3	3.2	2.0	1.8
1968	4.8	12.7	7.7	4.1	5.0	8.3	4.2	2.3	2.0
1969	4.7	12.3	7.5	3.8	4.9	8.9	3.7	2.5	2.3
1970	5.9	15.0	10.5	4.8	5.5	11.4	5.1	3.1	2.6
1971	6.4	16.3	11.3	5.2	5.5	12.4	6.1	3.6	2.9
1972	6.3	15.2	11.6	4.9	5.1	11.3	6.6	4.1	3.1
1973	5.6	12.9	10.0	4.1	4.7	10.8	6.5	3.9	2.8

**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

declined by only 0.7 per cent in 1973. It is difficult to sustain the view that the continuing relatively high rate of unemployment in 1973 represented any deficiency in aggregate demand. The remaining components of the aggregate rate of unemployment – apart from “cyclical” or “demand-deficient” unemployment – may be described as the seasonal, structural, and frictional components. To these may, perhaps, be added a small additional element representing those who claim to be looking for work but do not in fact want it, and who thus are not genuinely unemployed at all, although measured as such. We do not, at the moment, have much information concerning the relative importance of each of these components or of their changing importance over time.<sup>12</sup>

Despite the strong variations registered by the rate of job creation, the unemployment rate during the last three quarters of 1973 and the first quarter of 1974 remained remarkably stable – around a quarterly average of 5.5 per cent. It declined to 5.2 per cent during the second quarter of 1974, reaching a low of 4.9 per cent in June, while the overall participation rate showed a notable decline.

12 The determinants of aggregate unemployment are presently under review by the Labour Market Study group. Their findings will, it is hoped, throw additional light on the issues.

# 3

## *Conclusions and Recommendations*

The analyses in this Review have led us to a number of conclusions and recommendations, included here in the sections on performance, social indicators, and the National Economic Conference. In some cases, our conclusions must be regarded as no more than tentative, since the information and knowledge required to reach firm judgments are, for one reason or another, lacking. It is our hope that, even in these cases, by making it clear what information is needed, we may make some contribution to informed debate and stimulate others in government, universities, and the private sector to clarify further the issues involved.

### PERFORMANCE OF THE ECONOMY

The Economic Council has, from the time of its *First Annual Review* in 1963, encouraged policy-makers to take account of the supply capabilities of the Canadian economy in the formulation of demand management policies for Canada. In particular, it has developed, and fostered the use of, measures of Canada's economic potential and has encouraged the notion that the long-term growth of output should be as close to potential as possible.

However, we recognize that our measures of potential are not highly precise in that they do not indicate the appropriate level of total output at every point in time. Indeed, we now share the view that the potential rate and level of output may themselves vary, depending on the external environment postulated and the supply policies envisaged. We also recognize that aggregate unemployment, despite many indications of strain on the economy (including selective labour shortages), was, at 5.6 per cent in 1973, considerably above the 3.8 per cent level associated earlier with the achievement of potential. The Canadian economy was evidently operating close to, or at, its productive limits, in spite of some apparent slack in the labour market. The reason appeared to be that rapidly expanding demand following the 1970 slowdown had attracted new entrants into the labour force in unprecedented numbers, so that general shortages of plant capacity were encountered before widespread shortages of labour

became evident. This analysis seems to be confirmed by the comparison of the growth of capital stock and output.

From 1967 to 1972, the increase in capital stock was more or less equal to the increase in output, in both the manufacturing sector (4.8 and 5.0 per cent, respectively) and the economy as a whole (5.1 per cent in each case).<sup>1</sup> For total capital stock to have grown by the same rate as output in 1973 (6.8 per cent rather than the 5.1 per cent actually registered), the volume of net investment in 1973 would have had to be about 35 per cent higher. In manufacturing, additions to capital stock in 1973 would have had to almost double to match the increase in output. If 1972 were taken to represent a year of reasonable balance between output and capital stock in the economy, it would take about three years of roughly 10.5 per cent growth in the volume of total net investment to restore the 1972 ratio of capital to output, even assuming that output continues to increase only in line with the potential rate. We conclude that, even with more modest growth in output in 1974-76 and with rapidly increasing net investment, capacity will for some time remain tight in comparison with 1972. Attempts to raise output growth much above the potential rate would tend to delay still further the re-establishment of more normal relationships between capital stock and output.

Unfortunately, growth at the apparent potential rate appears unlikely to be accompanied by a further large reduction in aggregate unemployment. We cannot be absolutely sure of this, because the factors responsible for the jump in participation rates in 1973 are not certain, and we cannot predict with any precision how participation rates will behave in the future. Nor do we know as much as desired about the factors producing an average of 520,000 unemployed in 1973. A paradoxical feature of the 1973 experience was that, while employment increased by an unprecedented 430,000, unemployment declined by a mere 42,000. This puzzling phenomenon suggests the possibility, at least, that there are factors that tend to keep the numbers of measured unemployed substantially higher than in the past. Alternatively, it may suggest that the unemployment rate might move in a downward direction if employers find it increasingly difficult to fill vacancies with people outside the labour force.

It is anticipated that the Council's labour market study will provide a further useful perspective on the composition of unemployment or the characteristics of the unemployed at various points in time. Pending completion of that report, we merely conclude that deliberate pursuit of growth beyond its potential rate would not, under present circumstances,

1 Since capital stock data carry forward with a long lag the investment programs undertaken in earlier years, these growth rates mask the fact that business gross fixed capital formation increased only marginally over the period 1966-72. Thus, over this period, by relying heavily on capacity that had been put in place earlier, capital stock aged and potential capacity constraints accumulated.

reduce measured unemployment significantly; nor would it reduce the average duration of unemployment. On the contrary, it could well intensify inflation.

With the gap between actual and potential output having largely disappeared and with the economy demonstrating signs of strain, economic policy in 1973 and early 1974 moved away from its earlier strongly stimulative position. The rate of output expansion apparently peaked in the first quarter of 1974, with the economy continuing to operate under severe capacity limitations; and a slowdown in output growth appears to have been emerging in the remainder of the year as a result of weakness in the external environment, particularly in the United States.

Some fiscal offsets to the impact on the Canadian economy of reduced foreign growth in 1974 could result from decisions taken prior to 1974, for reasons not necessarily related to economic stabilization – namely, to increase family allowances; to index the personal income tax, and major transfer payments to persons, to the rise in the Consumer Price Index; to continue the corporate tax cut for the manufacturing and processing industries; and to maintain the across-the-board reduction in personal income tax granted in the February 1973 Budget. It would appear, however, that attempts to stimulate demand beyond that required to maintain an average increase in output at about the potential rate would make it difficult to achieve an adequate balance between supply and demand forces in the economy and would tend to aggravate inflationary pressures.

With the development of a strong upward trend in short-term interest rates in the United States, with the desire to maintain orderly conditions in the foreign exchange market, and with the need to ease the pressure on the Canadian economy created by the strong expansion of demand, monetary policy was largely directed towards less expansion during 1973. Such a stance was apparently maintained in the first half of 1974. The bank rate was raised in three steps in 1974, bringing to eight the number of increases since the spring of 1973. In the six-month period between January 1974 and July 1974, currency and demand deposits rose at an annual rate of about 9 per cent. When the money supply is defined more broadly to include personal saving and nonpersonal term and notice deposits, the increase amounts to a rate of 16 per cent, the higher growth resulting largely from strong increases in savings deposits related apparently to a change in personal portfolios.

Canada's performance had warranted, for some time, a clear moderation in the rate of monetary expansion, but no drastic curtailment. Continuation of such a policy would still be appropriate. Some upward flexibility of the external value of our currency could also be allowed in the interest of containing inflation. In an economy characterized by strains on capacity and severe shortages of certain types of labour and material, no real aggregate loss in the short term would result from appreciation of the



dollar, while there would be advantages to a lower rate of price increase and an improvement in the terms of trade. In the medium term, structural factors, such as Canada's privileged position with respect to natural resources and the anticipated inflow of external financing likely to be associated with their development, would continue to favour a tendency towards strengthening the external value of the Canadian dollar.<sup>2</sup>

### Performance Indicators for 1973-77

In developing a revised set of performance indicators for the period from 1973 to 1977, which we compare with the old indicators in Table 3-1, we not only had to take into account the recent performance of the Canadian economy but also to make some critical assumptions about the pattern of economic development over the next three years.

External economic conditions that will affect the future course of the economy are discussed in some detail in Chapter 6. In that chapter, we assume that the U.S. economy will recover mildly in 1975, following the marked slowdown in activity in 1974, and that growth in output will resume more strongly in 1976 and 1977. The unemployment rate in the United States is assumed to increase to about 5.5 per cent in 1975, then to decline to 5 per cent in 1977 as output growth improves. These projections are based on the June 1974 solution of the Wharton Annual and Industry Forecasting Model. The rate of increase in the GNE price deflator resulting from this solution slows down steadily from 9 per cent in 1974 to about 5 per cent in 1977. For Western Europe and Japan, we assume that the average annual growth of their industrial production will be about 6 per cent in the 1973-77 period.

In the energy area, the most crucial assumptions for the 1973-77 period relate to prices. We assume that the wellhead price of crude oil will increase to \$7.00 per barrel by 1976 and remain at that level in 1977; that the export tax will fall to \$3.60 per barrel in 1975 and to \$1.40 in 1976 and 1977; and that the international f.o.b. price will level off from \$8.50 in

2 As recommended in the *Tenth Annual Review*, the Canadian dollar should continue to float. The great difficulties that face the international monetary system suggest that the general floating of major currencies will continue for some time to come. It is important that the general float be operated in ways that are acceptable to major leading countries so that no country attempts to gain short-term advantages by competitive devaluation or by restricting imports. Thus the recent undertaking by the OECD countries to refrain from trade restrictions as a means of dealing with balance-of-payments problems created by the energy crisis and commodity price inflation is to be welcomed. We would also reiterate the recommendation that Canada participate fully in the GATT negotiations in order to maintain the access to foreign markets already gained in twenty-five years of negotiations; and to take steps to improve the productivity performance of Canadian industry by reducing foreign and Canadian barriers to trade.

**Table 3-1**  
**Performance Indicators, 1972-76 and 1973-77**

	Proposed Averages <sup>1</sup>	
	1972-76	1973-77 <sup>2</sup>
Gross National Expenditure	6.0	5.5
Consumer expenditures	5.9	5.0
Total investment	9.0	8.2
Machinery and equipment	12.0	9.5
Nonresidential construction		12.2
Residential construction	1.5	2.0
Government current expenditures	5.0	5.0
Exports of goods and services	6.0	4.5
Imports of goods and services	7.5	6.0
Real disposable income per capita	4.2	3.8
Total output per person employed	2.4	2.4
Output per person employed in manufacturing	4.5	4.0
Total employment	3.4	3.0
Differential between Canadian and foreign prices <sup>3</sup>	±0.5	±0.5
Number of housing starts (thousand per year)	245	245
Rate of unemployment in 1976 and 1977 (per cent)	4.5	4.5

1 For Gross National Product and its components, as well as real disposable income and productivity, the targets are average annual percentage changes calculated in 1961 dollars. The indicator for employment measures the percentage change in number of persons employed. The differential between Canadian and foreign prices is expressed in percentage points.

2 1973 is the base year to which the average annual percentage changes apply; 1974 is a year of transition for calculation purposes; 1975 to 1977 are the years to which the indicators apply, for policy purposes.

3 Absolute difference between the percentage change in the CPI, in Canada and the percentage change in the weighted index of consumer prices in the U.K., the U.S., West Germany, Japan, France, and Italy. The value of the indicator proposed in Table 3-1 of the *Tenth Review* implied a differential of a ±0.5 percentage point.

1974 and 1975 to \$7.00 in 1976 and 1977.<sup>3</sup> Aside from the construction of the Sarnia-Montreal pipeline and the commencement of construction of four tar-sands plants, no single large-scale investment project is expected to have an impact during these years.<sup>4</sup> Construction of the tar-sands plants would result in an additional investment of about \$625 million

3 Qualifications for the above are discussed in Chapter 5. The sensitivity of the results to alternative energy price assumptions is discussed in Appendix B.

4 Our calculations assume that the Mackenzie Valley pipeline will be built and that construction will start in the winter of 1976-77.

(in 1961 dollars) by 1977, or a cumulative total of about \$1.4 billion (in 1961 dollars) over the 1973-77 period. The full impact of all energy investment comes later in the 1970s.

In the case of government operations, we keep the assumption of constant nominal tax rates over the period covered by the performance indicators. For personal income tax, however, the indexation of exemptions and tax brackets to the change in the cost of living has been incorporated into the projections, as have the reductions to 1976 in the rate applicable to the first \$500 of taxable income, enacted in the 1971 Tax Reform. Allowance has been made for the increased royalty revenue accruing to provinces from higher oil prices and for the federal returns arising from the oil export tax. Similarly, on the expenditure side, account has been taken of the federal import subsidy on oil and oil products. Among other public expenditures, growth in transfer payments to persons is projected to decelerate considerably from its current high rate, as no additional major change in existing programs is assumed over the next three years.

The target growth rate for Gross National Expenditure is reduced from 6.0 to 5.5 per cent, reflecting the fact that the economy was operating close to full capacity in 1973. The former higher target rate for output growth was explicitly aimed at eliminating slack in the economy. We have scaled down the target rate for GNE because the economy can only grow at the potential rate, albeit at its upper limit. To allow for the re-establishment of a better capacity position, the proposed target rate would be consistent with slightly slower growth in 1974 and 1975 than in 1976 and 1977.

The target value for total investment is lowered to 8.2 per cent, because we assume a different time path for major energy-related investment than envisaged in the *Tenth Annual Review*.<sup>5</sup> This year we have also separated the business fixed capital formation indicator into its two major components – expenditures on machinery and equipment, and on nonresidential construction – so that the construction industry can be identified separately in the indicator framework, thus providing a standard against which progress towards more stable growth in this industry can be measured.<sup>6</sup>

5 The magnitude of additional investment in energy included in this Review for the indicator period 1973-77 is less, in real terms, than that considered in the *Tenth Annual Review* for 1972-76. This can be attributed to two factors: First, we now have a better idea of the time paths for major investment projects. In the *Tenth Annual Review*, the peaking of such investment took place in 1977, and the constant-dollar total for the period 1973-80 was \$8.0 billion. In our current analysis, such investment does not peak until 1979, two years after the period covered by the indicators, but the cumulative constant-dollar total for 1973-80 is \$5 billion. Second, the mix of energy projects under consideration has changed from that used in the *Tenth Annual Review*, in line with energy developments over the past year.

6 The adoption of a separate indicator for nonresidential construction was suggested in the Council report, *Toward More Stable Growth in Construction*.

Business nonresidential construction expenditures have been sluggish in recent years. Typically, outlays for nonresidential construction fluctuate widely and exhibit a cyclical pattern. The present rising level of investment represents, therefore, not only badly needed additions to the supply of real capital but also an expanding component of final demand. A shortfall in investment at this time would add to the strains that emerged in the economy in 1973. On the other hand, sharply increased expenditures would generate income and increase overall demand. Thus, in the medium term, the right balance must be found between the need to increase productive capacity and the need to ensure as much stability as possible in nonresidential spending and in the economy as a whole.

We believe that the rates appropriate for nonresidential construction expenditures and machinery and equipment spending are 12.2 and 9.5 per cent respectively. The higher target for nonresidential outlays reflects the larger nonresidential content of energy-related investments, as well as some catching-up of plant capacity. The indicator for housing starts remains the same at a yearly average of 245,000, and the indicator for the remaining component of total fixed investment – residential construction – is increased to 2.0 per cent, reflecting a change in expenditures per start.

The consumer expenditures indicator is set at 5.0 per cent, following its strong performance in 1973. The indicator for real disposable income per capita, however, is reduced slightly, to 3.8 per cent. These revisions are in line with the modification to the GNP growth target for the period 1973-77. The government current expenditure target is unchanged at 5.0 per cent.

Both the export and import targets have been reduced substantially from 6.0 and 7.5 to 4.5 and 6.0, respectively. The downward revision in exports arises from the much weaker external economic conditions confronting Canada than were envisaged a year ago. In the case of imports, the lower target rate is indicative of both the delay in the implementation of major energy-related projects and the reduction in the target rate for total output in the Canadian economy. The net effect of changes in the import and export indicators implies some deterioration in the current account balance and a corresponding increase in the degree of external financing.<sup>7</sup>

On the supply side, the decrease to 5.5 per cent in the indicator for Gross National Product affects mainly the rate of employment growth, which is reduced to 3.0 per cent. This follows a year in which employment

7 Although these volume changes could be partially offset by improvements in the terms of trade.



rose 5.2 per cent. The target for total output per person employed remains the same, at 2.4 per cent. In the manufacturing sector, the indicator for output per employee is revised downward to 4.0 per cent, which would appear to be a more realistic figure, given the pressures on capacity that were felt in a wide range of manufacturing industries in 1973. We retain a target of 4.5 per cent for the unemployment rate in 1977. This is in line with a continuing upward movement in participation rates, though not at the same rapid pace as in 1973. The participation rate is projected to increase from its current level of 57.8 per cent in June 1974 to an average of 59.0 per cent in 1977. This would contribute to an underlying increase in the labour force of about 2.8 per cent on average during the 1973-77 period. We also retain the relative differential between Canadian and foreign prices proposed in the *Tenth Annual Review*.

The new target values for the indicators must be viewed realistically as the result of an attempt to identify, as clearly and as consistently as possible, the set of values that might reasonably be sought as objectives during the next three-year period. We believe that the establishment of realistic target values for the economy can provide a useful adjunct to sound, forward-looking decision-making by governments and the private sector. Thus

#### *Recommendation 1*

*We recommend adoption of the interim performance indicator values for the years 1973 to 1977 set out in Table 3-1, including the new indicators for investment in machinery and equipment, and nonresidential construction.*

#### **The Problem of Inflation**

Inflationary pressures and developments related to energy have had, and will continue to have, a significant impact on the Canadian economy. The following recommendations – on international monetary arrangements, food prices, oil prices, and savings – deal either directly or indirectly with situations arising from these two factors.

#### *International Developments*

Our adoption of a relative standard for Canadian price performance was founded upon recognition of the international origins of much of the intensifying inflationary pressure experienced by Canada and other countries over most of the past decade. In Chapter 6, we draw attention to the very rapid rates of growth that have taken place in the money supply of the major industrial countries over the past six years. This growth was facilitated by, and often directly resulted from, the largely uncontrolled expansion of international currency reserves, particularly reserves of U.S.



dollars.<sup>8</sup> An important step in the process of controlling international inflation will be the future implementation of international monetary reform, designed, among other objectives, to establish co-operative international control over the growth of such currency reserves and to establish certain rules and consultative procedures to be followed when reserves exceed or fall short of agreed limits. The general direction in which the international monetary system could evolve has recently been established by the Committee of Twenty of the International Monetary Fund<sup>9</sup> but, in view of the continuing uncertainties related to inflation, the energy picture, and unsettled international conditions, detailed reform proposals have not been finalized. However, it is important that momentum towards reform be sustained and that the proposal in the reform package to limit the growth of currency reserves be implemented without undue delay.

In the immediate future, an easing of inflationary pressures requires general avoidance of excess aggregate demand. The Committee of Twenty have, in fact, affirmed their determination to adopt appropriate fiscal, monetary, and other policies to avoid inflation, recognizing that the main responsibility lies with individual national governments.<sup>10</sup> Recent meetings held under the auspices of the OECD have also recognized the danger of continued international inflation and have stated the need and the intention to avoid creating excess demand, as well as the necessity of shaping fiscal and monetary policies accordingly.<sup>11</sup> This evidence of international co-operation in the formulation of appropriate aggregate demand management policies is highly welcome. It is important that moves towards more restraint take place gradually, so that dangerous liquidity crises and similar financial disruptions may be avoided.

### *Recommendation 2*

*Recognizing the international origins of much of the inflationary pressure felt by Canada and other countries over the past decade, and bearing in mind the importance of the role played in the inflationary process by the growth*

8 Some aspects of the mechanism connecting exchange-reserve and money-supply growth in a fixed exchange rate system are discussed by R. A. Mundell in "Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates," *Canadian Journal of Economics and Political Science*, November 1963. Mundell shows that countries whose capital markets are well integrated with the world capital market and that are too small to affect world interest rates find it virtually impossible to offset (sterilize) the effects of stabilizing exchange rates on the domestic money supply. When such countries are characterized by persistent large balance-of-payments surpluses, the requisite stabilization of exchange rates leads to increases in their domestic money supplies.

9 International Monetary Fund, *IMF Survey*, "Supplement: Outline of Reform," June 17, 1974.

10 *Ibid.*

11 Organisation for Economic Co-operation and Development, *Observer*, June 1974.

*of the money supply in the leading industrial countries and the very rapid increase in monetary assets and liabilities not subject to central banking control, we recommend vigorous support by Canada of initiatives directed at securing co-operative international control over such monetary assets and liabilities and the growth of international currency reserves.*

### *Food Prices*

In the *Tenth Annual Review* we drew attention to the preponderant role played by food prices in the 1972 rate of inflation. Again in 1973, the sharp spurt in prices at the consumer level was particularly visible in food prices, which experienced their sharpest increase – 14.6 per cent – since the early postwar period. This was about double the rate registered in 1972 and about three times the rate recorded in the nonfood component of the Consumer Price Index. Food prices alone in 1973 contributed about half the overall increase in consumer prices, although their share of the consumer basket is about 25 per cent.

In view of the importance of food expenditures in total consumer expenditures and the severity of the rise in food prices, we favour the continued use of selective measures to deal with the problem rather than the adoption of any general system of price controls. These measures should represent sustained efforts to improve the stability of supply for agricultural commodities on a long-term basis and to maintain an equitable balance between the rights of efficient producers to adequate returns and the rights of consumers to food supplies at appropriate prices. Specific measures might involve subsidies for some basic dietary items, measures to expand supply consistent with orderly marketing, reductions in tariffs, and the removal of quota and other restrictions on trade in food commodities. Accordingly,

### *Recommendation 3*

*In dealing with the persistent food-price problems, we recommend the continued use of selective measures to increase food supplies and stimulate farm production rather than the adoption of any general system of food-price controls.*

### *Indexation*

Demands for the use of selective reference price indexes to adjust particular categories of earnings and transfer payments tend to increase with the persistence of severe inflationary price pressures. These demands are responses to the inherent uncertainties of inflation and the way it affects the achievement of the economic objectives of various social groups. Little is presently known about the consequences of indexation. Further, it is clear that some of these objectives will be less than fully realized

however complex the structures of particular indexation schemes. In line with well-established attitudes towards appropriate ways in which to define fiscal and contractual obligations, we feel that simplicity is a very desirable attribute to maintain. The purpose of indexation is not to protect the initial real standards of living of each individual, but to compensate for the loss of purchasing power arising from inflation. Thus it would not be desirable to adopt indexation methods allowing each particular category of participants to choose the price index that seems the most favourable. For these reasons, we would recommend that a single reference index be used wherever indexation is accepted. If certain other objectives are not achieved under a single system of indexation, other remedial policies can be sought. Until such time as the consequences of indexation are clearly spelled out,

#### *Recommendation 4*

*We recommend that when the principle of indexation is adopted in the public or private sector, a single general index be applied, irrespective of the groups or the categories of incomes involved.*

#### *Oil and Gas*

Our examination of alternative future patterns for the development of energy resources indicates that potential investment requirements for the production and transportation of oil and gas will be high in the late 1970s. This will particularly be so if high prices persist, if these high prices do not significantly deter domestic and foreign consumption, if there are no major easily accessible oil discoveries, and if oil imports are not stepped up. Even with relatively high domestic price levels, Canada's production of conventional oil will soon be declining and will fall below Canadian consumption levels in only a few years. Supplies from the tar sands, and from frontier oil fields involving large initial investment, will be needed at some time to fill this gap, at least partly. Decisions about the provision of such supplies need to be made shortly. It is important that the appropriate authorities expedite their ongoing inquiries into these matters with a view to providing a broadly acceptable, factual basis for certain critical decisions, including the timing of the construction of the Mackenzie Valley gas pipeline. The construction of such a major gas transportation facility would markedly intensify the heavy demands placed on the investment capacity of the Canadian economy if it were to proceed at the same time as the possible large-scale tar-sands development in the late 1970s.

Although Canada enjoys a temporary advantage in relation to other countries because, on balance, it is presently self-sufficient in oil and gas, it does not have long-term access to relatively cheap supplies. On the contrary, Canada will face sharply escalating oil production costs as more



expensive sources replace conventional ones. The policy of keeping oil prices to Canadian domestic consumers below the price of alternative supplies cannot be maintained for very long; and if it were pursued as a medium-term objective, it could serve to delay needed energy-conserving technological change, hasten the depletion of existing reserves, delay the provision of supplements and alternatives, lower the potential volume of savings, and perhaps foster abortive development of energy-intensive industries dependent upon the hidden subsidy for cheap oil and gas.

In considering the appropriate price level for Canadian oil supplies, it is obvious that, in the short run, higher oil prices would result in an increase in the cost of living in Canada. In the medium to longer term, on the other hand, oil prices will need to rise to restrain the growth of consumption of resources that are costly to replace, to stimulate the production of additional supplies, and to generate the necessary savings.

Despite the "economic" deterrents that a long-term rising trend in fuel prices will have on consumption, there are many decisions in the public domain regarding energy use that are not directly subject to the discipline of market forces. Such actions may serve to favour or delay the implementation of energy-saving technology and may foster or discourage a smooth transition to the exigencies of a less resource-abundant future. As well, over the transition period to higher energy prices, the market forces may not be sufficient to adequately discourage wasteful forms of energy by the private sector. To this extent, public authorities should inquire into, and encourage, the adoption of energy-saving techniques. For instance, they should emphasize long-term planning of urban developments designed to economize on the use of increasingly scarce energy and to accommodate the needs of people to move efficiently and comfortably within environmental standards. It is not too early to canvass the appropriate shape of energy developments after 1985, including the most desirable allocation of energy supplies among agriculture, transportation, manufacturing, and household needs.

Canadian supply policy for energy is directed towards achieving a greater degree of self-reliance. This implies that prices for energy products will need to remain high in order to achieve an appropriate balance between supply and demand in the long run. Yet there is the risk over the longer term that low-cost production of oil and gas in other parts of the world could provide competitive advantages to energy-intensive industries in other countries that have access to lower-cost feedstock. Canada, however, has medium-term advantages over potential competitors as a site for energy-intensive industries. These include a developed infrastructure, skilled labour, and stable government, all of which will allow Canadian industry to share competitively in the rapidly growing world market for petrochemicals, at least until these specific attractions decline in relative importance. In the light of the foregoing considerations,

*Recommendation 5*

*We recommend that the federal and provincial governments allow the domestic price of oil to move to international levels over the medium term and that they inquire into, and encourage, the adoption of energy-conserving practices.*

*Savings*

Our projections of the economy (see Appendix B) indicate that capital requirements in the late 1970s may be very substantial. They also show that the volume of savings generated in Canada by then could be inadequate, regardless of the extent to which energy resources are developed. In our model, only indirect evidence is given on the adequacy of domestic savings. Our only indicator in this respect is the current account deficit (in dollars or, better, as a percentage of GNP) and, by implication, the degree of reliance on foreign savings. Whether domestic savings are adequate or not, therefore, becomes a matter of judgment. In fact, our projections show increasing reliance on foreign savings throughout the 1970s, reaching 2.6 per cent of GNP in 1980 in the medium-price scenario for energy described in Chapter 5.

Given the high investment requirements over the medium term, we take the view that savings should be encouraged. This view is reinforced by the present inflationary environment. With anticipated inflation and the possibility of a negative real rate of return on investment, a high premium is given to consumption against saving; this, in turn, tends to increase inflationary pressures further. It is, therefore, important to ensure an appropriate balance between consumption and savings.

One potential source of savings is, of course, the higher profits, or taxes and royalties, associated with increased oil and gas prices. A larger volume of discretionary personal savings could perhaps be stimulated by appropriate new incentives. These incentives have, until very recently, been conspicuously absent.

The form in which savings are held and channeled into various uses is also clearly affected by the tax system and the way in which it treats various types of inflationary gain or loss. In this connection, it is apparent that the indexation of the personal income tax in 1974 represents only a partial correction of the tendency of the tax system to shift real resources from the private sector to the government sector simply as a result of the inflationary process. The sale of capital assets during periods of inflation, for example, may give rise to taxable gains, even though, in real terms, the seller may not have made a capital gain. Similarly, the real value of capital consumption allowances for tax purposes declines during periods of inflation, thereby reducing the ability of business firms to replace fixed assets through self-financing. The tax system during a period of inflation



may affect both the total supply of savings and the allocation of savings to the purchase of different assets. Thus

*Recommendation 6*

*We recommend that the federal and provincial governments, in formulating their fiscal policies, carefully consider the effects of taxes and inflation on the total supply and disposition of savings; that they examine the feasibility of providing further incentives to personal savings, preferably in forms that do not affect the structure of portfolios available to savers; and that they recognize the need to sustain an appropriate long-term flow of business savings.*

## SOCIAL INDICATORS

There is a clear need for an expanded framework within which to examine a broader range of socio-economic activities than those encompassed by the existing economic indicators. To this end, we have put forward in Chapter 1 a general approach for the development of social indicators, and in Chapter 4 we have proposed some first approximations of certain principal indicators that touch on three areas of socio-economic concern: housing, health, and the environment. The principal indicators proposed are not intended, and should not be considered, to represent all facets of well-being in these areas, but only certain particular aspects, and these imperfectly. Being first-approximation measures, they are subject to modification as more knowledge of these areas is developed and more information becomes available. At present, it is best to regard these indicators basically as monitoring devices that gauge the state of, and changes in, certain matters of importance to society and provide some initial insights of significance for policy and planning. They are a very modest contribution to what is needed in the way of measures of social phenomena if there is to be a better understanding of the socio-economic forces at work in our society. However, as knowledge of these and other areas increases, it will be possible at a later stage to introduce certain objectives associated with some of these measures.

### Housing

Two indicators relevant to housing quality are proposed: a crowding index (persons per room), and the percentage of income paid per room. The second indicator is complementary to the first in that it is essentially a measure of the cost of housing quality in relation to the ability to pay. The change in the first indicator between 1961 and 1971 shows an overall improvement in the quality of housing in Canada. However, the change in

the second indicator over this period shows that the percentage of income paid per room has risen overall for the major urban areas.

The material presented in Chapter 4 suggests that there remain a number of problems with respect to the distribution of housing quality and its costs for particular groups and regions. Consequently, housing policies should take into account, to a greater extent than in the past, these distributional considerations. In particular, more emphasis should be given to policies that channel aid directly in an attempt to moderate disparities in housing quality that are more prevalent in certain areas or among certain socio-economic groups. An example of one such policy would be to encourage the renovation and enlargement of existing low-quality crowded dwellings. About 21 per cent of households in Canada live in conditions we regard as being excessively crowded. Since new starts at *peak times* are equivalent to only about 4 per cent of the existing stock, greater emphasis should be placed on renovation activities if we are to achieve a more rapid improvement in housing quality.

The National Housing Act (NHA), administered largely by the Central Mortgage and Housing Corporation, and certain provincial and municipal statutes contain provisions designed to promote the renovation, improvement, and enlargement of existing dwellings. A 1973 amendment to the NHA contains additional provisions intended to encourage these activities to a greater degree by extending preferred interest loans and grants under certain conditions. It is still too early to evaluate the efficacy of this new act, but questions about its flexibility (the conditions for aid may be overly restrictive and stringent) and the effectiveness of its incentives have been raised. Stronger measures may be necessary to provide sufficient encouragement to homeowners and landlords to undertake the renovation of low-quality dwellings, since the present pattern of incentives does not seem to be adequate for this purpose. Some measures could not easily be applied across the country in a uniform or broadly standardized fashion because of the great variety of local conditions. Thus the federal and provincial governments should encourage more co-operative efforts, involving direct action by the municipalities, with sufficient flexibility of financing to suit these varying conditions. Additionally, certain impediments to renovation activity that exist in some urban centres might reasonably be removed.

#### *Recommendation 7*

*We recommend that co-ordinated efforts be made by the federal government through the Central Mortgage and Housing Corporation and by the appropriate provincial and municipal authorities to provide more effective incentives to encourage the renovation, improvement, and enlargement of existing low-quality dwellings. Since smaller urban areas tend to have a higher proportion of crowded housing than larger centres, the federal and provincial*

*governments should make special efforts to aid these smaller urban areas to take advantage of the provisions encouraging renovation activity.*

## Health

Three initial health indicators are proposed: life expectancy at birth, the infant mortality rate, and the prime-age mortality rate (the effects of accidental and violent deaths, except suicide, being excluded in all cases).

Life expectancy at birth in Canada has increased considerably since 1931 and is continuing to rise. However, the disparity in life expectancy between the sexes has also grown over this period with the life expectancy for women exceeding that for men by about six years in 1971.

The infant mortality rate dropped by over one-half between 1951 and 1972; yet Canada's present rate still does not compare well with that of many other developed countries. The changes or distributional differences in the infant mortality rate do not appear to be associated with changing demographic characteristics, but rather with certain environmental, socio-economic, and health care delivery system factors.

About 40,000 people between the ages of 35 and 64 die every year from illness, and this represents a considerable social and economic loss to society. The overall prime-age mortality rate dropped only about 16 per cent over the period 1951 to 1972, but it declined considerably more for women (28 per cent) than for men (7 per cent). This difference is a contributing factor to the growing gap in life expectancy between men and women. What needs to be better understood are those socio-economic, environmental, and health care delivery system factors that have a significant impact on prime-age mortality.

While these mortality-based indicators are of considerable value in shedding light on certain important aspects of the health of Canadians, a more complete picture calls for the development of indicators concerned directly with morbidity. In order to develop such indicators, detailed, consistent, and comparable data on treated morbidity are required for all areas of the country. Such information is potentially available through the provincial medical care and hospital insurance plans,<sup>12</sup> and should include rates of participation in the medical care insurance plans; the number of cases treated for each participant broken down by the ICDA code;<sup>13</sup> the type and number of services rendered in each case, along with

12 In addition, there are intentions to make some improvements in existing hospital morbidity data.

13 See Statistics Canada, *Causes of Death, 1970*, Cat. No. 84-203 (Ottawa: Information Canada, 1971). Data in this publication are based on detailed categories of the International Classification of Diseases Adapted (ICDA), of the World Health Organization.

their costs; and other relevant data. This information should be disaggregated by age, sex, socio-economic characteristics, and regions within a province. The need for steps to improve and integrate health statistics has been noted in the context of a research strategy for health in a working document produced recently by the Minister of Health and Welfare.<sup>14</sup> The development of indicators, through the compilation and analysis of such data, will help to make the policy options clearer. We feel that the proposed "Canada Health Survey," under consideration by Statistics Canada and Health and Welfare Canada in consultation with the provinces, is necessary, especially since it may provide information on the extent of untreated morbidity.

#### *Recommendation 8*

*We recommend that efforts should be made by the Federal-Provincial Conference of Deputy Ministers of Health to ensure that the data produced by the organizations responsible for the administration of the provincial medical care and hospital insurance plans are consistent, comparable, and sufficient for the development of national morbidity-based health indicators. To this end, we suggest that the Conference should meet during the course of the next year specifically to begin discussion on this matter.*

#### **Environment**

The quality of the air we breathe, which is affected by society's production and consumption activities, affects our general health and well-being. The air quality indicator proposed in Chapter 4 covers a number of urban areas and is based on the ambient air concentration of several pollutants and on proxies representing the relative effect of these pollutants on human health and well-being. The value of this indicator is that it permits an overview of air quality in the individual urban centres, and for much of urban Canada as a whole, and points to major existing and emerging problems. According to this indicator and its components, the quality of urban air improved over the period 1971 to 1973, both generally and with respect to each of the pollutants except the nitrogen oxides.

Several undertakings would contribute to the formulation of an improved indicator of urban air quality and to the design of more effective abatement policies and programs. One would involve a more detailed and consistent monitoring of a wider range of pollutants in a larger number of urban areas; another, the development of a sounder scientific foundation from which the relative severity factors for the various pollutants could be

14 M. Lalonde, *A New Perspective on the Health of Canadians: A Working Document*, Government of Canada (Ottawa, 1974), see p. 69, no. 35.



derived. Further, decision-makers require regularly updated emission inventories<sup>15</sup> as well as some idea, on an urban and regional basis, of the nature of the relationship between emissions and ambient air quality.

#### *Recommendation 9*

*We recommend that, under the auspices of the Canadian Council of Resource and Environment Ministers:*

- a a comprehensive, consistent, and continuous air-pollutant monitoring system be established in all urban areas of 50,000 population or more; in urban areas of over 10,000 population, with poor air ventilation for significant periods of time; and in other areas containing industrial plants that emit large amounts of airborne pollutants – taking into appropriate account the technical and financial implications involved;*
- b aid and other encouragement be given to research for the purposes of determining more precise standards with respect to the acceptable ambient air concentrations of each major pollutant, or combinations of these pollutants, consistent with human health and well-being and the maintenance of the physical and natural environment;*
- c standardized approaches be employed to compile, on a regularly updated basis, emission inventories for all areas for which ambient air-quality monitoring is deemed necessary; and*
- d efforts be made to understand how pollutant emissions, the transformation of pollutants in the atmosphere, meteorological conditions, and other factors combine to produce the observed ambient air quality over major urban centres – using the expertise that can be found in many provincial ministries, federal departments and agencies, universities, and private corporations throughout Canada.*

### SUMMARY CONCLUSIONS OF THE 1973 NATIONAL ECONOMIC CONFERENCE

The first National Economic Conference, sponsored by the Economic Council of Canada, and held in December 1973, recognized a strong basic potential for Canada in the years ahead. However, Conference delegates also drew attention to a number of important constraints on the economy's ability to achieve full potential growth and maintain stable economic conditions. The Conference coincided with the worldwide state

15 Emission inventories are data on the actual amounts of each pollutant emitted in a given area over a specific period, according to source (automobiles, power generation, heating, and other).

of uncertainty about the extent of energy shortages and the sharp increases in energy prices. Among other constraints and uncertainties, the most prominent were the impacts on the economy of inflation, shortages of a broad range of materials, mismatching in the supply of, and demand for, labour, international trade and monetary conditions, and the overall thrust of government policies. The need to present and discuss the goals and aspirations of Canadians against a background of economic potential was clearly recognized. Many of the Conference discussions, therefore, focused on issues closely related to matters taken up in this Review; they also helped to establish the priority issues for the 1974 Conference this December.

Although the Conference did not arrive at detailed prescriptions for policy, it identified broad issues and procedures that are significant in the national setting. For example, Conference delegates generally agreed on a need for:

- a Clarification of government policy positions—for example, in energy, transportation, agriculture, the further processing of materials, taxation, and in policies related to broader social objectives;
- b Stronger consultative mechanisms among the various levels of government;
- c Increased opportunities to co-ordinate the wide range of consultations already taking place among governments, industry, labour, farm groups, and consumers;
- d An expanded program by the Economic Council itself to ensure that its research and recommendations take fully into account the priorities of decision-makers in the private and government sectors, and that the Council offer maximum assistance to decision-makers in their efforts to relate to, and make use of, the Council's performance indicator framework; and
- e Consideration of the impact of policies and proposals on income distribution and on the well-being of Canadians.

Thus the National Economic Conference identified areas of concern in the decision-making process and in matters of consultation and "concertation" that relate very closely to recommendations that the Economic Council has made in recent years and continues to make.

Progress made at the 1973 Conference has thus constituted an important first step in the direction of achieving an adequate process of consultation in Canada. There remain, however, as the members of a number of industry committees emphasized, many diverse management-labour-government contacts and exchanges of view. They lose much of their effectiveness

because of the lack of co-ordination and the absence, within the consultative and decision-making process, of any clear perspective of longer-term, comprehensive objectives for individual industries, of government policies, or of economic and social goals and targets more generally. A number of delegates expressed the view that the individual industries and interest groups would benefit from a continuing organization that would consider, in a systematic way, the industry's perspective in the light of the developing economic situation and government policies. The continuing industry organization could be made more effective, in the view of some delegates, if its deliberations were set within the comprehensive analytical framework of the Economic Council of Canada. In that setting, an objective evaluation could be made of each industry's perceptions and of its relationship with plans and activities in other industries and sectors. The Economic Council, the Steering Committee of the National Economic Conference, the industry committees of the Conference, and the various other support activities of the Conference, might provide overall guidance for the private efforts being made.

In order to support the industry committees and the interest groups in this process of evaluation, the Economic Council and the Conference Steering Committee so far have taken four specific actions:

- 1 An analytical support group was established to evaluate industry sector targets and the national indicator targets developed by the Economic Council of Canada. This analysis is to be co-ordinated through the Conference secretariat.
- 2 The Economic Council has ensured that the perceptions of the Conference participants and support groups have an impact on the formulation of its new indicators.
- 3 The Council has requested specific comments on the report and the papers of the 1973 Conference from relevant departments and agencies of the federal and provincial governments.
- 4 The extension of contacts has been encouraged, on priority decisions and key Conference issues, to include a wider range of interest groups concerned with economic and social priorities including, among others, a larger number of government participants.

The recommendations by Conference delegates also dealt with other activities of the Economic Council. It was widely recognized by the delegates, for example, that the Council's assessments and medium- and long-term economic objectives have greater potential than has yet been used. A number of specific suggestions were made for further Council action to improve and extend that analysis and to work with the private sector and with government departments to this end. However, perhaps

the overriding requirement in this process, as perceived by many delegates, was the need to ensure that the Council's analysis and recommendations can be related more directly to their own perceptions and decision-making activities. This task of "translating" and making immediately relevant the Council's evaluations of the performance and of the economic targets and social goals also requires reciprocal action by those in business, government, and the community at large who would benefit from that analysis. This interpretive activity is receiving further study by the Council and by the Conference Steering Committee in its use of Council material.

Deliberations leading up to the 1973 National Economic Conference centred in sixteen committees. These represented such industries as mining, agriculture, and construction and included broader sectors such as energy, education, and health. Each committee prepared an Outlook Paper, providing both an assessment of the economic outlook and the conclusions and recommendations of that specific industry or sector. These papers deserve serious consideration in their own right.<sup>16</sup> A summary is set out in Chapter 8.

16 The Outlook Papers for the sixteen industries are reproduced in detail in the *Papers of the National Economic Conference, 1973*, referred to in the Introduction to this Review.



## **PART 2**

# 4

## *Selected Social Indicators*

Social indicators are the set of outputs and relevant inputs for a socially oriented area of concern. A general approach to the development of these indicators and the need for a small number of key output indicators for each area is discussed in Chapter 1. These latter measures are intended to gauge, in a summary manner, the state of, and changes in, certain major aspects of social activity. In this chapter, we propose certain first approximations of principal indicators for three areas: housing, health, and the natural environment. We also attempt to determine analytically some of the factors associated with variations in these indicators.

The choice of these particular areas is in no way intended to imply that other socially oriented areas are necessarily less important. In fact, work is also being done at the Council on the development of detailed input and output indicators for education (mainly in a co-operative project with the Ontario Ministry of Education),<sup>1</sup> urban systems,<sup>2</sup> and aspects of cultural and linguistic relationships. The areas of housing, health, and the natural environment were selected essentially because existing data and knowledge suggested that it might be relatively easier, in practical terms, to develop summary indicators for them. Moreover, the three areas chosen are considered important, since they may be among those affected to the greatest extent by changes occurring as a result of certain basic trends influencing the evolution of our society.<sup>3</sup>

The indicators proposed are not intended, and should not be considered, to represent all aspects of housing, health, or the natural environment; rather, they are simply certain important aspects of these areas at a first-approximation level. They are therefore subject to modification as more is learned of these areas and their interactions with other areas of concern. At present, these indicators should essentially be regarded as monitoring devices that provide some potentially significant insights for policy and planning. In the future, however, we will attempt wherever possible to set specific objectives for the outputs of these and other socially

1 J. Greenberg, "Social Indicators in Education: A Conceptual Framework," Economic Council of Canada Discussion Paper 6, 1974.

2 A. M. Maslove, "Urban Indicators: A Theoretical and Empirical Analysis, Part 1," Economic Council of Canada Discussion Paper 5, 1973.

3 D. W. Henderson, *Social Indicators: A Rationale and Research Framework*, Economic Council of Canada (Ottawa: Information Canada, 1974), Chapter 6.

oriented areas, taking into account the economic and social implications of these objectives.

The material presented in this chapter and later in Appendix A is a modest and preliminary contribution towards providing a wider spectrum of measures of socio-economic activity. We are cognizant of the interests and activities of other organizations in the development of social indicators. In fact, we have been greatly assisted in our work by a number of federal, provincial, and municipal departments and agencies and by private groups, not only in the difficult task of assembling the necessary data, but also through their advice and expertise.

### HOUSING INDICATORS

As an aspect of general community well-being and as a factor in human welfare, the quality of our housing stock is clearly of prime importance. Over the last two decades, the emphasis of Canadian housing policy has been on the *quantitative* requirements of housing rather than the *qualitative* adequacy of the stock. Our concern with quality includes more than measures of certain basic structural features of a house; it encompasses as well a concern with the environmental and social dimensions of housing.

What we put forward here are first approximations of principal housing indicators that attempt to take account of the effects of changing economic and social conditions on housing adequacy. In particular, we propose two indicators that, from our analysis, appear at present to best represent housing welfare in Canada.<sup>4</sup> The first is the *crowding index* or the number of persons per room, and the second is the *rent (or value) per room as a percentage of income*.<sup>5</sup> We should stress, at this point, that the crowding index is used not only because it is an important physical and social aspect of housing adequacy in itself, but also because it is highly correlated with other measures of quality and thus serves as a good proxy for them (see Tables A-1 and A-2). The second indicator, which is complementary to the first, provides a measure of the cost of housing quality in relation to the ability to pay; it is comparable over time and across regions.

#### The Crowding Index

Housing quality, as measured by the crowding index, has generally improved in recent years. The average number of persons per room in

4 For more details on the choice of indicators, see Appendix A.

5 The definition of rooms counted in the Census is as follows: "only rooms used or suitable for living purposes in the dwelling (including rooms occupied by servants, lodgers, or members of lodging families). Sun rooms, summer kitchens, recreation rooms, attic rooms, etc. . . are counted as rooms only if they are finished off and suitable for year-round living quarters. Not counted as rooms are: bathrooms, clothes closets, pantries, halls, or rooms used solely for business purposes."

all households in Canada has changed from .75 in 1951 to .64 in 1971 (Table 4-1). For a four-member family, this change is roughly equivalent to having one additional room. Further, though strict international comparisons are difficult, Canada appears to be among the countries with the least crowded housing (Table 4-2). However, in spite of this overall improvement, many households still live in unacceptably crowded conditions, and considerable regional and local differences, as well as those associated with certain socio-economic characteristics, remain.<sup>6</sup> It is to these and related matters that we turn our attention here.

**Table 4-1**  
**Crowding Index (Average Number of Persons per Room),**  
**Canada, 1921-71<sup>1</sup>**

	1921	1931 <sup>2</sup>	1941	1951	1961	1971
Total	.84	.79	.80	.75	.74	.64
Urban	.79	.75	.78	.74	.73	.63
Rural	.89	.84	.83	.75	.75	.68

1 These figures are not strictly comparable for the earlier years because of changes in definitions of what constitutes a household, dwelling, or occupied room.

2 Excludes rooming houses with nine or more lodgers.

SOURCE Census data from Statistics Canada and estimates by the Economic Council of Canada.

**Table 4-2**  
**International Comparison of Crowding Index<sup>1</sup>**

	Year	Average Number of Persons per Room
United Kingdom	1961	0.63
United States	1970	0.63
Canada	1971	0.64
Australia	1971	0.66
Sweden	1970	0.72
New Zealand	1966	0.75
Denmark	1965	0.80
France	1968	0.93
Japan	1970	0.97
Finland	1970	1.00

1 The definitions of what constitutes a room vary somewhat from country to country. For this reason, these figures are only approximately comparable.

SOURCE United Nations, *Statistical Yearbook, 1972* (New York, 1973); Statistics Canada; and estimates by the Economic Council of Canada.

6 Crowding differs from density in that the former is the number of persons per room in a household, and the latter is the number of persons per acre or square mile. The characteristics being measured by these two variables are therefore quite different.



Table 4-3  
Percentage Change in Crowding Index, Canada, by Region<sup>1</sup> and Major Urban Area, 1961-71

	Crowding Index		Percentage Change	Persons per Household <sup>2</sup>		Percentage Change	Rooms per Dwelling		Percentage Change
	1961	1971		1961	1971		1961	1971	
Canada	.74	.64	-13.5	3.9	3.5	-10.3	5.3	5.4	+ 1.9
Urban	.73	.63	-13.7	3.7	3.4	- 8.1	5.2	5.3	+ 1.9
Rural Farm	.73	.66	- 9.6	4.6	4.3	- 6.5	6.4	6.4	0.0
Rural Nonfarm	.77	.68	-11.7	4.0	3.8	- 5.0	5.3	5.5	+ 3.8
Atlantic Region	.74	.69	- 6.8	4.3	4.0	- 7.0	5.9	5.7	- 3.4
St. John's	.85	.72	-15.3	4.8	4.2	-12.5	5.7	5.9	+ 3.5
Halifax	.79	.67	-15.2	4.0	3.6	-10.0	5.1	5.4	+ 5.9
Saint John	.71	.64	- 9.9	3.8	3.6	- 5.3	5.4	5.6	+ 3.7
Quebec	.81	.70	-13.6	4.2	3.7	-11.9	5.3	5.2	- 1.9
Quebec	.81	.70	-13.6	4.2	3.6	-14.3	5.3	5.1	- 3.8
Montreal	.77	.68	-11.7	3.7	3.3	-10.8	4.9	4.9	0.0
Sherbrooke	.83	.71	-14.5	4.0	3.4	-15.0	4.8	4.8	0.0
Trois-Rivières	.85	.72	-15.3	4.3	3.6	-16.3	5.1	5.1	0.0

Ontario	.67	.60	-10.4	3.7	3.4	-8.1	5.5	5.6	+1.8
Toronto	.67	.60	-10.4	3.7	3.3	-10.8	5.5	5.6	+1.8
Ottawa	.74	.63	-14.9	3.9	3.5	-10.3	5.3	5.5	+3.8
Hamilton	.68	.60	-11.8	3.7	3.4	-8.1	5.4	5.6	+3.7
Windsor	.67	.60	-10.4	3.6	3.4	-5.6	5.4	5.6	+3.7
London	.65	.56	-13.8	3.4	3.2	-5.9	5.3	5.7	+7.5
Kitchener	.67	.60	-10.4	3.6	3.3	-8.3	5.4	5.6	+3.7
Sudbury	.91	.76	-16.5	4.1	3.9	-4.9	4.6	5.1	+10.9
Oshawa	.69	.63	-8.7	3.6	3.5	-2.8	5.3	5.6	+5.7
Kingston	.69	.59	-14.5	3.6	3.3	-8.3	5.3	5.6	+5.7
Prairie Region	.76	.63	-17.1	3.7	3.4	-8.1	4.9	5.3	+8.2
Winnipeg	.73	.62	-15.1	3.6	3.2	-11.1	4.9	5.1	+4.1
Regina	.76	.61	-19.7	3.6	3.2	-11.1	4.8	5.3	+10.4
Saskatoon	.72	.58	-19.4	3.5	3.2	-8.6	5.0	5.4	+8.0
Edmonton	.74	.62	-16.2	3.7	3.3	-10.8	5.0	5.4	+8.0
Calgary	.70	.58	-17.1	3.4	3.3	-2.9	5.0	5.6	+12.0
British Columbia	.70	.61	-12.9	3.4	3.2	-5.9	4.9	5.2	+6.1
Vancouver	.66	.58	-12.1	3.3	3.0	-9.1	5.0	5.2	+4.0
Victoria	.62	.54	-12.9	3.1	2.9	-6.5	5.0	5.3	+6.0

1 The regional figures are for the entire province or region in each case, not simply for the cities shown.

2 Households and dwellings are defined as follows in the Census: *Household* - "A person or group of persons occupying one dwelling. It usually consists of a family group, with or without lodgers, employees, etc. However, it may consist of two or more families sharing a dwelling, of a group of unrelated persons, or of one person living alone." *Dwelling* - "A structurally separate set of living quarters with a private entrance from outside or from a common hallway or stairway inside the building; i.e., the entrance must not be through someone else's living quarters." Collective dwellings are not included (e.g., hotels, motels, hospitals, staff residences, institutions, military camps, work camps, and all jails and missions).

SOURCE Statistics Canada, 1961 and 1971 Census data; and estimates by the Economic Council of Canada.

Table 4-3 shows the average number of persons per room, persons per household, and rooms per dwelling (the ratio of the latter two gives the first – the crowding index) for Canada, by region and major urban area, 1961-71, and notes the percentage change in these measures over this decade. The crowding index decreased in all regions and major cities over this period, but in 1971 there were still considerable regional differences, with Ontario having the lowest index (.60 persons per room) and Quebec the highest (.70 persons per room). Over the 1961-71 period, the largest improvement in the crowding index occurred in the Prairie Region (about 17 per cent) and the smallest in the Atlantic Region (about 7 per cent).

For Canada as a whole, the decrease in the crowding index between 1961 and 1971 is a result of both the approximately 10 per cent decrease in the average number of persons per household and the almost 2 per cent increase in the average number of rooms per dwelling. In three of the five regions and most major cities, the reduction in average household size has had the greater effect on the change in the crowding index over this period. This is particularly notable in the province of Quebec and the Atlantic Region, where the average dwelling size actually decreased overall (by 1.9 and 3.4 per cent, respectively), and in the major urban centres of Quebec, where the average dwelling size either decreased or remained unchanged. In these cases, the reduction in the crowding index is entirely because of the decrease in the average number of persons per household, which is partly explained by the reduction in the birth rate and by the fact that young people and the elderly are living in separate households to a greater extent than before. In general, households increased in number relative to population over this period, and this implies a considerable additional investment in housing.

In most regions a "catch-up" process occurred in the major cities between 1961 and 1971 in that the crowding indexes for the cities with the highest indexes in a particular region in 1961 tended to decrease relative to those for the other cities in the same region over this period. For example, in the Atlantic Region, the crowding indexes for St. John's and Halifax, both of which were higher than the index for Saint John in 1961, decreased considerably more between 1961 and 1971 relative to Saint John (about 15 per cent versus 10 per cent). Still, distinct regional differences remain, with the major cities in British Columbia having among the lowest crowding indexes and the major cities in Quebec having among the highest in both 1961 and 1971.

The distribution of households by level of crowding for Canada and the regions, and for the urban and rural areas, is shown for 1971 in Table 4-4. If we regard those households with a crowding index of 1.0 or more as unacceptably crowded,<sup>7</sup> we find that a surprisingly substantial

7 In other words, a family of four would live in four rooms – a kitchen, living room, bedroom for the parents, and bedroom for the two children – or less.

proportion of households in this country fall in this category. Over 21 per cent (1.3 million) of all households have one or more persons per room, with the proportion rising to over one-quarter in Quebec and the Atlantic Region. In 1961, about 31 per cent (1.4 million) of all households had one or more persons per room. Although there was considerable improvement over this decade, the proportion of overly crowded households remains high.

Looking at the percentage of households containing one or more persons per room, we observe in Table 4-4 that the rural areas in Canada

**Table 4-4**  
**Percentage Distribution of Households, by Level of Crowding,**  
**in Urban and Rural Areas, Canada, by Region, 1971**

Persons per Room	Total	Urban				Rural	
		100,000 or more	30,000- 99,999	10,000- 29,999	1,000- 9,999	Nonfarm	Farm
(Per cent)							
Canada							
.500 or less	42.6	43.3	41.2	41.4	42.8	42.5	40.0
.501 — .999	36.0	37.8	37.0	37.1	34.2	30.3	35.7
1.000 or more	21.4	18.9	21.7	21.5	23.0	27.2	24.3
Atlantic Region							
.500 or less	39.4	37.5	41.2	37.3	38.6	39.5	46.4
.501 — .999	32.9	38.5	36.0	35.9	32.9	29.3	33.5
1.000 or more	27.7	24.0	22.9	26.8	28.5	31.2	20.1
Quebec							
.500 or less	35.8	37.4	34.1	30.3	34.0	36.3	29.2
.501 — .999	37.1	37.8	37.4	39.4	36.8	32.3	38.1
1.000 or more	27.1	24.8	28.5	30.3	29.1	31.4	32.7
Ontario							
.500 or less	46.3	45.7	43.7	47.6	49.3	47.4	49.4
.501 — .999	36.7	38.3	37.5	37.1	33.6	31.6	35.6
1.000 or more	17.0	16.0	18.8	15.3	17.1	21.1	15.0
Prairie Region							
.500 or less	44.3	44.2	50.2	43.3	47.3	46.9	38.1
.501 — .999	34.9	38.4	34.7	35.3	32.4	25.6	35.0
1.000 or more	20.9	17.4	15.1	21.4	20.3	27.5	26.9
British Columbia							
.500 or less	46.8	50.1	41.9	46.4	44.4	41.7	37.0
.501 — .999	35.0	35.3	37.9	35.8	35.0	32.7	37.1
1.000 or more	18.2	14.6	20.2	17.8	20.6	25.6	25.8

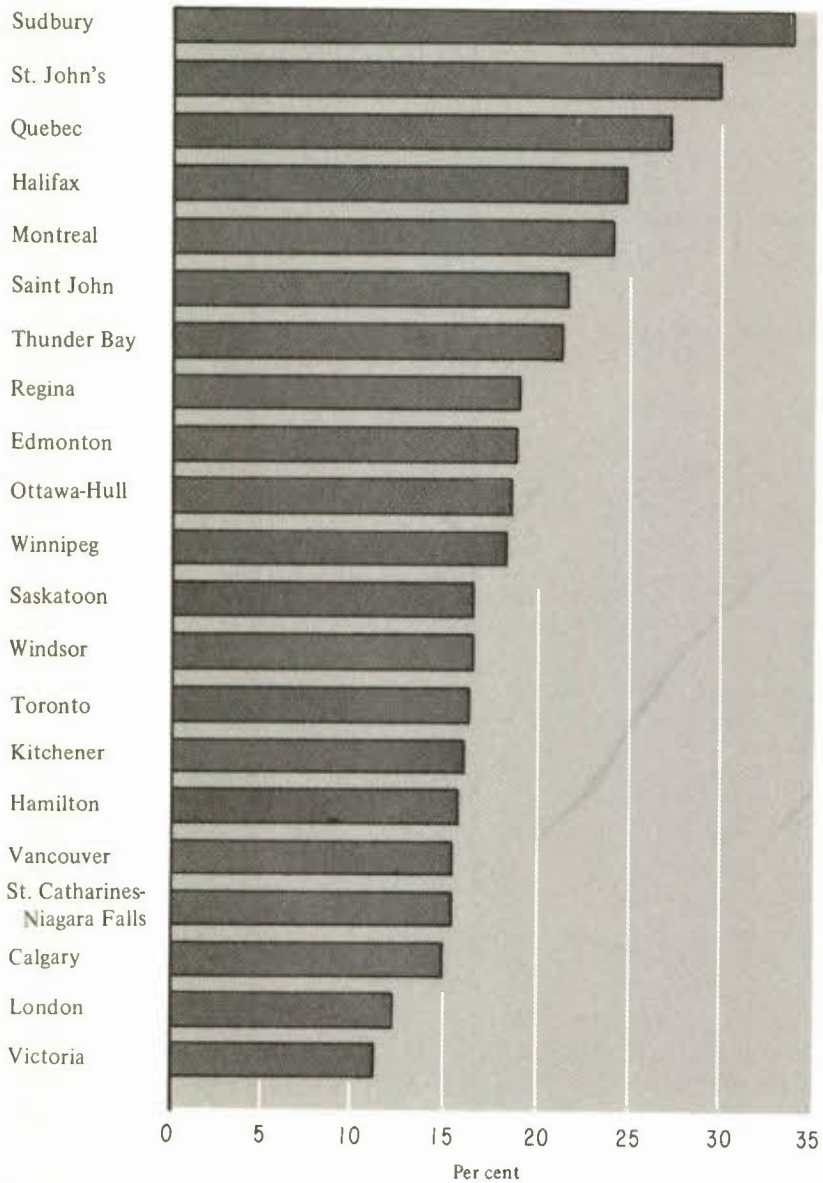
NOTE Figures may not add to 100 per cent because of rounding.

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.



have a higher overall proportion of crowded households than the urban areas. In addition, the percentage of crowded households tends to decrease as city size increases; this is not because the big cities have larger

**Chart 4-1**  
**Percentage of Households with One or More Persons per Room,**  
**Selected Cities, 1971**



**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.

dwellings, but rather because there are more small households, particularly single-person households. Table 4-4 also shows that there are considerable regional differences, with the Atlantic Region and Quebec having the highest percentage of households with one or more persons per room (28 and 27 per cent, respectively) and Ontario, the lowest (17 per cent).

There are striking intercity differences in the percentage of households having one or more persons per room (Chart 4-1). The proportions range from highs of 34.0 per cent for Sudbury and 30.0 per cent for St. John's, to 12.4 per cent for London and 11.5 per cent for Victoria.

Two further facts about the distribution of crowding are revealed by Table 4-5. First, in metropolitan and other urban areas in Canada in 1971, the crowding index is higher for rented dwellings than for owner-occupied

Table 4-5

## Crowding Index, Canada, by Urban and Major Metropolitan Area, 1971

	All Units			Urbanized Core <sup>1</sup>			Fringe Areas <sup>2</sup>		
	Total	Owned	Rented	Total	Owned	Rented	Total	Owned	Rented
Canada	.64	.63	.68						
Urban	.63	.61	.67						
500,000+	.62	.59	.66						
100,000-499,999	.61	.60	.65						
30,000-99,999	.65	.62	.69						
10,000-29,999	.65	.63	.70						
5,000-9,999	.66	.63	.72						
Under 5,000	.65	.63	.70						
Halifax	.67	.63	.72	.66	.61	.71	.73	.72	.78
Montreal	.68	.64	.70	.67	.63	.70	.71	.69	.77
Quebec	.70	.69	.72	.70	.68	.72	.76	.75	.80
Toronto	.60	.58	.64	.60	.58	.64	.60	.60	.66
Hamilton	.60	.59	.64	.60	.59	.64	.60	.60	.63
Ottawa	.63	.60	.66	.62	.60	.66	.66	.64	.70
Winnipeg	.62	.61	.63	.62	.60	.62	.70	.68	.75
Edmonton	.62	.60	.65	.61	.59	.64	.68	.68	.72
Vancouver	.58	.56	.60	.58	.56	.60	.60	.58	.68
Victoria	.54	.54	.56	.54	.53	.55	.57	.56	.62

1 The urbanized core is composed of the largest city and the municipalities that are completely or partly located within the built-up area.

2 The fringe is part of the census metropolitan area or of the census agglomeration outside the urbanized core. It corresponds to the immediate zone of influence of a multi-municipal urban centre and comprises all municipalities within a twenty-mile radius of the urbanized core.

SOURCE Statistics Canada, 1971 Census, Cat. No. 93-730, vol. 2, pt. 3 (Bulletin 2.3-5).

dwelling, since houses tend to have more rooms than apartments and most of the latter are rented. Second, the suburbs and fringe areas of the major metropolitan areas have a higher crowding index than the core areas – with the exception of Toronto and Hamilton, each of which has the same crowding index for both areas.

Table 4-6 shows the distribution of the crowding index by various socio-economic characteristics for Canada in 1961 (the 1971 material for the whole of Canada was not available at time of writing) and selected major urban areas in 1961 and 1971. For the 1961 data, the level of observation is largely the census enumeration area (containing a maximum of 200 households or 100 farms); for the 1971 data, it is the census tract (containing an average of 1,500 households in the urban areas). Consequently, the individual extremes are blurred, and the range of the crowding index for a particular socio-economic characteristic is not as great as it would have been if individual household data had been available. Nonetheless, certain facts emerge. For the major urban areas in 1961, the crowding index decreases steadily with rising household incomes – from .84 for the lowest income group to .59 for the highest. However, for these same urban areas in 1971 the variation in crowding between household income groups was less, overall, than in 1961, and the lowest and highest income households were less crowded than the other households. Over this decade the lowest income households enjoyed a greater reduction in crowding than the other households. This can be partly explained by the “undoubling” of households that occurred over this period; that is, in 1971 proportionately more young single individuals and elderly people were living separately instead of with their families than in 1961, and these people tend to have lower incomes, on average, and live in less-crowded situations.

For Canada and the major urban areas, Table 4-6 shows that lower rents tend to be associated with a higher crowding index. Further, the crowding index, as expected, increases with the size of households, from an average of .61 persons per room for two or less persons to 1.14 for six or more persons for Canada in 1961. The same holds for the major urban areas in both 1961 and 1971. In fact, analysis indicates that the size of households has a greater impact on crowding than any other single factor tested, including total household income, or age of dwelling (see Appendix A for the regressions for 1971). Additionally, Table 4-6 suggests that newer dwellings tend to be more crowded than older units, although this pattern is less marked within major urban areas than on a national level. Finally, households headed by persons aged 65 or over have a lower crowding index than other households, partly because they tend to be smaller households.

**Table 4-6**  
**Crowding Index, by Socio-Economic Characteristic,**  
**Canada, 1961, and Major Urban Areas, 1961 and 1971**

	Canada	Major Urban Areas <sup>1</sup>	
	1961	1961	1971
Average	.73 <sup>2</sup>	.71 <sup>3</sup>	.63 <sup>3</sup>
Total household income <sup>4</sup>			
Lowest quintile	*	.84	.55
Second quintile	*	.77	.64
Middle quintile	*	.75	.65
Fourth quintile	*	.69	.61
Highest quintile	*	.59	.52
Rent (or value) per month (\$1961) <sup>4</sup>			
\$50 or less	.80	.77	.71
\$51 to \$100	.75	.78	.68
\$101 to \$200	.70	.69	.63
\$201 or more	.55	.55	.55
Persons per household <sup>4</sup>			
2 or less	.61	.58	.51
2.1 to 3.0	.62	.60	.57
3.1 to 4.0	.69	.68	.65
4.1 to 6.0	.81	.80	.74
6.1 or more	1.14	.97	*
Age of dwelling <sup>5, 6</sup>			
Built before 1920 (1946)	.70	.71	.61
Built during 1921-45 (1946-60)	.72	.68	.63
Built during 1946-59 (1960-68)	.76	.72	.64
Built during 1960-61 (1969-71)	.79	.73	.64
Age of head of household <sup>5</sup>			
65 or over	.70	.68	.59
Under 65	.73	.71	.63

\*Insufficient number of observations or not available.

1 Twenty-three cities that were metropolitan areas or major urban agglomerations in 1971 were used in this analysis. See Table 4-3 for the cities.

2 This figure differs slightly from the overall crowding index for Canada noted in Table 4-1. Certain enumeration areas were necessarily dropped from this analysis because data were incomplete.

3 These averages are calculated on the basis of the crowding indexes for the twenty-three cities weighted by the number of households.

4 A characteristic is disaggregated according to the weighted average value (income, rent, or persons) of each census tract for 1971 and each enumeration area for 1961 (except for total household income for the major urban areas in 1961 where the level of observation is the census tract).

5 The value for each category is determined through the use of weights made up of the number of relevant households in each census tract (in 1971) or enumeration area (in 1961) as a proportion of all relevant households in the category.

6 The time periods not in parentheses are relevant to the 1961 data; those in parentheses, to the 1971 data.

SOURCE Statistics Canada, 1961 and 1971 Censuses; and estimates by the Economic Council of Canada.



Table 4-7  
Rent (or Value) per Room as a Percentage of Total Household Income, Major Urban Areas, 1961-71<sup>1</sup>

	Rent (or Value) per Room as a Percentage of Income		Percentage Change <sup>2</sup>	Average Rent (or Value) per Room per Year		Percentage Change	Average Total Household Income per Year		Percentage Change
	1961	1971		1961	1971		1961	1971	
	(Annual basis)			(Dollars)			(Dollars)		
Major urban areas	3.69	4.21	+14.1	237.6	439.7	+85.1	6,442	10,445	+62.1
Atlantic Region									
St. John's	3.9	3.8	-2.2	220.4	345.8	+56.9	5,668	9,093	+60.4
Halifax	4.2	4.1	-1.4	267.3	426.2	+59.4	6,366	10,292	+61.7
Saint John	2.7	3.3	+21.0	144.2	284.9	+97.6	5,319	8,684	+63.3
Quebec									
Québec	2.8	3.6	+29.5	166.1	352.9	+112.5	5,972	9,799	+64.1
Montreal	2.3	3.8	+62.6	147.7	375.0	+153.9	6,326	9,879	+56.2
Sherbrooke	3.8	3.8	+0.1	188.2	336.9	+79.0	4,938	8,835	+78.9
Trois-Rivières	3.1	3.4	+9.4	160.2	297.4	+85.6	5,112	8,675	+69.7

<b>Ontario</b>										
Toronto	4.0	4.5	+12.9	297.6	539.4	+ 81.3	7,419	11,912	+60.6	
Ottawa	3.8	3.8	- 2.0	274.7	439.6	+ 60.0	7,152	11,684	+63.4	
Hamilton	4.1	4.3	+ 5.6	264.4	457.0	+ 72.8	6,430	10,519	+63.6	
Windsor	3.8	4.0	+ 4.7	209.3	436.8	+108.7	5,446	10,853	+99.3	
London	4.3	3.8	-11.0	262.4	387.2	+ 47.6	6,140	10,175	+65.7	
Kitchener	3.9	4.2	+ 6.1	242.4	433.9	+ 79.0	6,139	10,361	+68.8	
Sudbury	4.3	3.8	-10.6	288.5	458.8	+ 59.0	6,736	11,989	+78.0	
Oshawa	4.1	4.5	+ 9.9	254.8	468.7	+ 83.9	6,176	10,339	+67.4	
Kingston	4.0	4.2	+ 4.0	249.2	425.0	+ 70.5	6,215	10,187	+63.9	
<b>Prairie Region</b>										
Winnipeg	4.1	3.9	- 4.0	252.9	369.2	+ 46.0	6,172	9,381	+52.0	
Regina	4.2	3.8	-10.3	266.8	340.1	+ 27.5	6,297	8,947	+42.1	
Saskatoon	4.3	3.9	- 9.4	254.5	336.2	+ 32.1	5,948	8,674	+45.8	
Edmonton	4.3	4.2	- 4.0	269.6	422.9	+ 56.9	6,219	10,165	+63.5	
Calgary	4.5	4.0	-11.0	286.4	410.9	+ 43.5	6,384	10,290	+61.2	
<b>British Columbia</b>										
Vancouver	4.8	5.2	+ 8.1	282.6	512.0	+ 81.2	5,923	9,930	+67.7	
Victoria	4.7	5.4	+12.9	254.5	479.0	+ 88.2	5,366	8,947	+66.7	

1 The level of observation is the census enumeration area for rent (or value) per room in 1961, and the census tract otherwise.

2 Based on the difference between the unrounded values of rent (or value) per room as a percentage of income.

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Rent (or Value) per Room as a Percentage of Income**

The second indicator is the average annual rent (or rent imputed from value) per room as a percentage of the average total household income. This indicator supplements the first by treating the cost of housing quality (in the sense that each additional room contributes to reduced crowding) in relation to ability to pay. As is shown in Table 4-7, the average value of the indicator increased from about 3.7 per cent in 1961 to about 4.2 per cent in 1971 for selected major urban areas because the average rent (or value) per room had increased more in this period (about 85 per cent) than average total household income (which rose about 62 per cent).<sup>8</sup> Once again there are notable regional differences; for example, the metropolitan areas of Vancouver and Victoria have the highest indicator values in 1971 – 5.2 per cent and 5.4 per cent, respectively – and those in Quebec have among the lowest values. Thus those living in the metropolitan areas of British Columbia spend a higher proportion of their income per room (in other words, housing quality costs more relative to income) than those living in the major urban areas of Quebec. With respect to changes in the indicator over the period 1961 to 1971, the major urban areas in Quebec and British Columbia showed an overall increase, while those on the Prairies all experienced decreases.

Table 4-8 shows the distributional aspects of this indicator by various socio-economic characteristics for the major urban areas as a whole in 1961 and 1971.<sup>9</sup> To begin with, rent (or value) per room as a percentage of income in 1961 was somewhat higher for the middle-income households than for the highest- or lowest-income households. However, in 1971 the indicator decreased with increasing income – going from 7.5 per cent for the lowest-income households to 3.2 per cent for the highest. While the value of the indicator remained about the same for households with higher incomes over the 1961-71 period, it increased notably for households with lower incomes. This can again be partly explained by the undoubling that occurred over this period, as mentioned earlier, in that the young single individuals and the elderly people forming their own households receive less income on average; furthermore, they pay more for their housing than if they were part of a larger household. Consistent with this explanation is the fact that the indicator is greater for smaller households in 1971 than in 1961.

8 Given the existing conditions in the housing market, this indicator has probably increased further since 1971. Certain CMHC data indicate that the average cost of new housing financed through the NHA has increased as a percentage of family income since 1970.

9 The same distributional aspects of this indicator are shown for certain individual cities in Table A-4.

Table 4-8

Rent (or Value) per Room as a Percentage of Total Household Income,  
by Socio-Economic Characteristic, Major Urban Areas,<sup>1</sup>  
Canada, 1961 and 1971

	1961	1971
Average	3.7	4.2
Total household income <sup>2</sup>		
Lowest quintile	2.4	7.5
Second quintile	3.4	5.0
Middle quintile	3.9	4.4
Fourth quintile	3.9	4.0
Highest quintile	3.1	3.2
Rent (or value) per month (\$1961) <sup>2</sup>		
\$50 or less	0.9	3.2
\$51 to \$100	3.8	4.2
\$101 to \$200	4.3	4.3
\$201 or more	2.8	3.7
Persons per household <sup>2</sup>		
2 or less	2.1	6.2
2.1 to 3.0	3.8	4.5
3.1 to 4.0	3.7	4.0
4.1 to 6.0	3.7	3.4
6.1 or more	2.6	*
Age of dwelling <sup>3</sup>		
Built before 1920 (1946) <sup>4</sup>	3.3	4.3
Built during 1921-45 (1946-60)	3.6	4.1
Built during 1946-59 (1961-68)	3.9	4.2
Built during 1960-61 (1969-71)	3.9	4.2
Age of head of household <sup>3</sup>		
65 or over	3.7	4.3
Under 65	3.7	4.2

\*Insufficient number of observations.

1 Twenty-three cities that were metropolitan areas or major urban agglomerations in 1971 were used in this analysis. See Table 4-7 for the cities.

2 A characteristic is disaggregated according to the weighted average value (income, rent, or persons) of each census tract.

3 The value for each category is determined through the use of weights made up of the number of relevant households in each census tract as a proportion of all relevant households in the category.

4 The time periods not in parentheses are relevant to the 1961 data; those in parentheses, to the 1971 data.

SOURCE Statistics Canada, 1971 Census; and estimates by the Economic Council of Canada.



In 1961, the indicator decreased as the age of the dwelling increased, but in 1971 the age of the dwelling made no significant difference. Finally, in both 1961 and 1971, the indicator was virtually the same whether the head of the household was young or over 65.

In conclusion, the first-approximation indicator of housing quality (the crowding index) showed an improvement during the last decade, not only in absolute terms but also in relative terms, between certain regions and with respect to some socio-economic characteristics. On the other hand, the second indicator – the cost per room relative to income – has increased over this period. In addition, there are certain distributional problems with respect to both indicators. It should be noted, however, that knowledge in this area is still embryonic, and additional research and quality-oriented data are clearly needed.

### HEALTH INDICATORS

The health of Canadians has benefited considerably from the many advances in medical knowledge and improvements in the delivery of health care over the past few decades. Further, partially as a result of changing social awareness, the quantity and quality of health and medical services made “freely” available to individuals have reached unprecedented levels in Canada. Private and public spending in this area rose from \$114 per capita in 1960 to \$306 per capita in 1971, or from 5.3 per cent of GNP in 1960 to 7.1 per cent in 1971.<sup>10</sup> Nonetheless, in spite of the advances in the health field and the increases in expenditures, there remain considerable problems concerning the treatment and prevention of disease and the organization and distribution of health and medical care.

In attempting to deal with these problems, considerations about the effectiveness and efficiency of health care delivery systems remain of key importance. However, there is also a growing tendency to take account of other factors affecting the state of health of the population, such as the standard of living, environmental aspects, and the extent to which demand reacts positively to efforts to supply health care. These preoccupations are reflected in our present work.

#### The Measurement of Health

Health, being intimately linked with survival, has always been one of society's major concerns. The overall goal is clear – to improve the general

10 Health and Welfare Canada, *National Health Expenditures in Canada, 1960-71, with Comparative Data for the United States* (Ottawa, October 1973).

level of human health. In principle, it would be preferable to state the more precise objectives of this area in terms of positive health. This concept is intended to take into account the overall health status of the members of society, including not only morbidity<sup>11</sup> and mortality rates, but also the effects of the biological state and environment of individuals on their potential susceptibility to disease or death. Thus, for example, obese individuals may be free of all symptoms of illness at a given point in time, but their positive health status cannot be said to be optimal because they are relatively more susceptible to certain forms of morbidity. However, the present state of knowledge does not allow the measurement of health in terms of this concept, and thus the more conventional measures of morbidity and/or mortality must be relied on in defining the outputs and formulating the health indicators.

While it would be preferable to employ both measures, since a broader spectrum of health concerns would be covered, we have decided at this early stage to use mortality rather than morbidity as a basis for developing first-approximation indicators, for two basic reasons. First, the use of morbidity poses the difficult problems of choosing a basis for determining the relative effect on human health of the various types of disease – for instance, in terms of duration of malady, degree of impediment of normal activity, effect on life span, discomfort, or perhaps in some other way – and then of assigning weights to the various categories of disease.

Further, mortality data exist in an essentially complete, detailed, and consistent form, while historical morbidity data are largely oriented to hospital morbidity and therefore do not take account of visits to doctors and the like; the published hospital morbidity data begin only in 1960 and are not as complete (data for Ontario are not included) or consistent as one would like. Nonetheless, in view of the data beginning to emerge from the provincial medical insurance plans, we believe that attempts should now be made to begin development of morbidity-oriented indicators of health.

In this chapter, three important mortality-oriented facets of health – *life expectancy*, *infant mortality*, and *prime-age mortality*<sup>12</sup> – have been singled out for the purpose of formulating indicators that permit some partial assessment of the progress being made in this area. Accidental and violent deaths (with the exception of suicide, because of its association with mental disturbance) have been removed from the calculation of life expectancy and the mortality rates. The focus of our interest is health. Therefore, deaths attributed to murder, accidental poisoning, automobile accidents, industrial accidents, and the like, are not included.

11 "Morbidity" is defined simply as a state or symptom of physical or mental disease.

12 See Appendix A for a brief discussion of the choice of these facets of mortality.

### Life Expectancy

In Table 4-9 life expectancy at birth (excluding accidental and violent deaths) is given by sex from 1931 to 1971 for Canada, by province or region; the effect of accidental and violent deaths on the duration of life is shown in parentheses. Life expectancy was 71.4 years for men and 77.3 years for women in 1971. Although these figures represent a marked improvement over the past forty years, life expectancy is still lower in Canada than in certain other developed countries (Table 4-10). However, it continues to increase at a notable rate in Canada: for women it grew at a rate of over three months per year between 1966 and 1971 (a total of 1.3 years over this period); for men, at about 1.5 months per year. Most of the increase in life expectancy between 1931 and 1971, for both men and women, was a result of factors other than the decrease in the infant mortality rate, although it played a significant role (see Tables A-5 and A-6).

As can be seen in Table 4-9, there are considerable regional differences in life expectancy, with Saskatchewan having the highest life expectancy (73.3 years for men and 78.4 years for women in 1971)—virtually equivalent to that of the highest ranking countries—and Quebec having the lowest (70.3 years for men and 76.2 years for women in 1971). Regional differences, however, are relatively smaller now than they were in 1931. There is also a considerable disparity in life expectancy between the sexes. Women not only have a greater life expectancy than men, but the difference between their life expectancies has increased significantly over time—from 0.9 years in 1931 to 5.9 years in 1971. To explain the regional disparities in life expectancy, certain environmental factors and differences in social mores can be suggested, while biological and life-style differences may play a role in the disparity between the sexes. There may, however, be other factors at work as well.

In Chart 4-2, the proportion of the eligible population who received health care services covered by government medical care insurance plans at least once in the course of a year (the participation rate) is shown for males and females between the ages of 25 and 54 for Saskatchewan, New Brunswick, and Quebec. In general, the higher the participation rate during these vital years, the higher the life expectancy. However, this apparent correspondence between life expectancy and participation rates should only be regarded as representing a reasonable line of further investigation at this time. Nonetheless, the question arises whether the differing participation rates during this time of life might account for some of the disparity in life expectancy between the sexes and between regions. According to the chart, women participate more on the average (even after childbearing years) and live longer than men; furthermore, the people in Saskatchewan participate more and live longer than those in New

Table 4-9

**Life Expectancy at Birth (Excluding Accidental and Violent Deaths except Suicide),<sup>1</sup> by Sex, Canada, by Region,<sup>2</sup> 1931-71**

	Atlantic Region <sup>3</sup>					Prairie Region <sup>3</sup>					British Columbia
	Canada	Newfound-land	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskat- chewan	Alberta	
	(Years)										
1931 — Males	61.8 (1.8)			62.0 (1.8)		57.8 (1.6)	63.2 (1.9)		65.1 (1.6)		64.6 (2.4)
	62.7 (0.6)			62.4 (0.5)		58.3 (0.5)	64.6 (0.7)		66.1 (0.6)		66.1 (0.8)
1941 — Males	64.8 (1.8)			63.7 (2.0)		61.7 (1.5)	66.5 (1.9)		67.1 (1.7)		66.1 (2.4)
	66.9 (0.6)			65.2 (0.6)		63.6 (0.5)	69.2 (0.8)		68.8 (0.6)		69.7 (0.7)
1951 — Males	68.2 (1.9)			68.5 (1.9)		66.2 (1.8)	68.7 (1.8)		70.1 (1.7)		69.3 (2.6)
	71.5 (0.7)			71.1 (0.6)		69.1 (0.5)	72.6 (0.7)		72.9 (0.6)		73.3 (0.9)
1956 — Males	69.5 (1.9)			69.9 (2.0)		68.0 (1.9)	69.7 (1.9)		71.1 (1.8)		70.5 (2.4)
	73.6 (0.7)			73.5 (0.6)		71.7 (0.7)	74.3 (0.7)		74.9 (0.7)		74.7 (0.8)
1961 — Males	70.2 (1.8)			70.6 (2.0)		69.1 (1.8)	70.0 (1.7)		71.6 (1.8)		71.3 (2.4)
	74.9 (0.7)			74.6 (0.7)		73.4 (0.6)	75.1 (0.7)		76.3 (0.6)		76.3 (0.9)
1966 — Males	70.8 (2.0)	70.9 (2.0)	71.0 (2.7)	70.6 (2.3)	71.1 (2.6)	69.9 (2.0)	70.4 (1.7)	71.7 (1.9)	72.6 (2.1)	72.3 (2.2)	71.7 (2.5)
	76.0 (0.8)	75.0 (0.6)	76.4 (0.9)	75.6 (0.8)	76.2 (0.9)	74.7 (0.8)	76.3 (0.8)	77.0 (0.9)	77.4 (0.9)	77.1 (0.9)	76.9 (1.1)
1971 — Males	71.4 (2.0)	70.9 (1.7)	71.6 (2.3)	70.8 (2.2)	71.4 (2.3)	70.3 (2.1)	71.2 (1.6)	72.2 (2.0)	73.3 (2.2)	72.7 (2.3)	72.5 (2.6)
	77.3 (0.9)	76.4 (0.7)	78.2 (0.8)	76.8 (0.8)	77.2 (0.8)	76.2 (0.9)	77.5 (0.8)	77.9 (1.0)	78.4 (0.8)	78.3 (1.0)	77.9 (1.2)

<sup>1</sup> The figures in parentheses represent the effect of accidental and violent deaths on life expectancy at birth. Subtracting the figures in parentheses from the figures to their left gives life expectancy at birth, taking all causes of death into account - that is, the life expectancy figures usually presented.

<sup>2</sup> Excluding Newfoundland in 1931 and 1941.

<sup>3</sup> Figures for 1931 to 1961 are averages of all the provinces in the region.

SOURCE Based on data from Statistics Canada and material prepared for the Economic Council of Canada by Y. Péron, Department of Demography, University of Montreal.



**Table 4-10**  
**Life Expectancy at Birth in Selected Countries<sup>1</sup>**

	Year	Life Expectancy at Birth	
		Males	Females
Sweden	1967	71.9	76.5
Norway	1966-70	71.1	76.8
Iceland	1961-65	70.8	76.2
Netherlands	1970	70.7	76.5
Denmark	1969-70	70.8	75.7
Switzerland	1958-63	68.7	74.1
	1971	69.3	76.4
<i>Canada</i>	(1966)	(68.8)	(75.2)
France	1970	68.6	76.1
Japan	1968	69.1	74.3
England and Wales	1968-70	68.6	74.9
Australia	1960-62	67.9	74.2
United States	1971	67.4	74.9
Federal Republic of Germany	1968-70	67.2	73.4

<sup>1</sup> Accidental and violent deaths are included; data are for the most recent years available.

SOURCE United Nations, *Statistical Yearbook, 1972* (New York, 1973); and U.S. Office of Management and Budget, *Social Indicators, 1973* (Washington, 1973).

Brunswick, and those in New Brunswick participate more and live longer than those in Quebec.

To conclude, life expectancy at birth (excluding accidental and violent deaths) should be considered as a first approximation of a principal indicator for the area of health, and particular attention should be paid to differences between the sexes and between regions. This indicator provides a reasonable base from which to estimate the effect of changes in health-related mortality patterns on life expectancy. Life expectancy at other points in the life cycle (at ages one, forty, and sixty) can be regarded as supplementary indicators (see Appendix A).

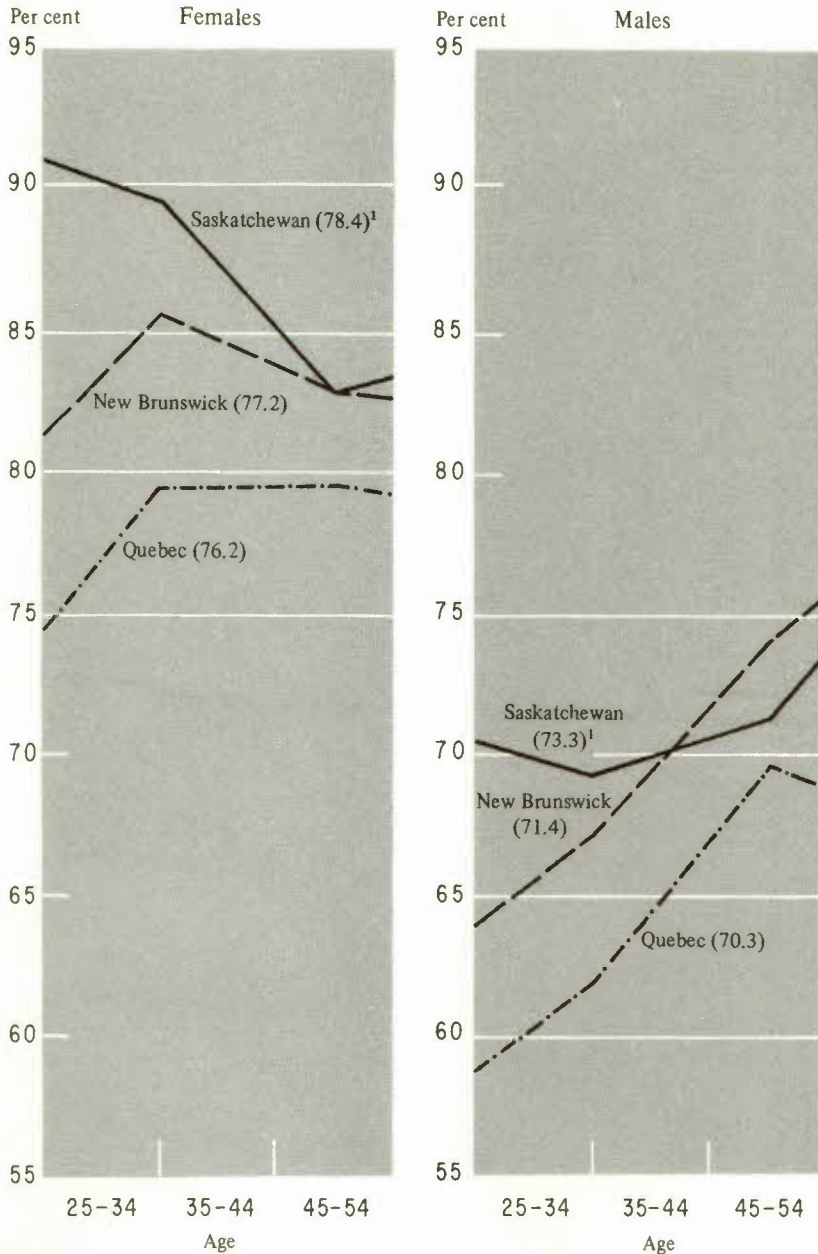
### **Infant Mortality**

The mortality rate among liveborn children less than one year old – the infant mortality rate – is equaled only by that of people over 60. For this



Chart 4-2

**Rate of Participation in Government Medical Insurance Plans  
by Females and Males Aged 25 to 54 Years,  
Saskatchewan (1973), New Brunswick (1973), and Quebec (1971-72)**



<sup>1</sup> Life expectancy at birth in 1971, excluding accidental and violent deaths.

SOURCE Marcel Rodrigue, *Use of Physicians in a National Medical Care Plan: The Quebec Experience - Fiscal Year, 1971-72*, Health and Welfare Canada (forthcoming); the Saskatchewan Medical Care Insurance Commission; and the New Brunswick Medicare Division, Department of Health.

reason and others, such as our relatively poor performance vis-à-vis the other developed countries (Table 4-11), infant mortality is regarded as a serious problem.<sup>13</sup>

**Table 4-11**  
**International Comparison of Infant Mortality Rates**  
**(Including Accidental and Violent Deaths)**

	Year	Mortality Rate
		(Per 1,000 live births)
Sweden	1971	11.1
Netherlands	1971	11.1
Finland	1971	11.8
Japan	1971	12.4
Norway	1970	12.7
Iceland	1970	13.2
Denmark	1970	14.2
Switzerland	1971	14.4
France	1971	14.4
New Zealand	1971	16.5
Australia	1971	17.3
England and Wales	1971	17.5
Canada	1971	17.5
United States	1971	19.2

SOURCE    United Nations, *Statistical Yearbook, 1972* (New York, 1973).

Table 4-12 shows that the infant mortality rate – excluding accidental and violent deaths – has diminished considerably in Canada since 1951, but still there were 1,624 deaths per 100,000 live births in 1972. The rates, which are higher for males than for females, decreased by the same percentage for the two sexes between 1951 and 1972 (about 57 per cent). The neo-natal mortality rate – the rate for the period 0 to 28 days after live birth – has fallen off to a lesser extent than the post-neo-natal mortality rate – the rate for the period 28 days to one year after live birth. Post-neo-natal mortality is most frequently associated with exogenous causes, and these problems can generally be more easily handled by medical means than those which are endogenous in nature.

13    The higher infant mortality rates among Indians and Eskimos, although deplorable, have only a minor impact on Canada's overall infant mortality rate, mainly because they represent a very small proportion of the population.

Table 4-12

**Infant, Neo-Natal, and Post-Neo-Natal Mortality Rates (Excluding Accidental and Violent Deaths),  
by Sex, Canada,<sup>1</sup> 1951-72**

	Infant Mortality Rate			Neo-Natal Mortality Rate <sup>2</sup>			Post-Neo-Natal Mortality Rate		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
	(Per 100,000 live births)								
1951	3,728	4,147	3,286	2,250	2,554	1,927	1,478	1,593	1,359
1954	3,083	3,452	2,692	1,919	2,172	1,651	1,164	1,280	1,041
1957	2,976	3,319	2,614	2,006	2,275	1,733	970	1,044	881
1960	2,616	2,948	2,266	1,743	1,995	1,476	873	953	790
1963	2,515	2,827	2,187	1,793	2,046	1,527	722	781	660
1966	2,195	2,445	1,931	1,601	1,802	1,389	594	643	542
1969	1,845	2,070	1,607	1,382	1,566	1,188	463	504	419
1972	1,624	1,805	1,432	1,175	1,305	1,037	449	500	395
Percentage change, 1951-72	-56.4	-56.5	-56.4	-47.8	-48.9	-46.2	-69.6	-68.6	-70.9

<sup>1</sup> Including Yukon and Northwest Territories.

<sup>2</sup> The neo-natal mortality rates for 1951 and 1954 are estimated to include the Yukon and Northwest Territories.

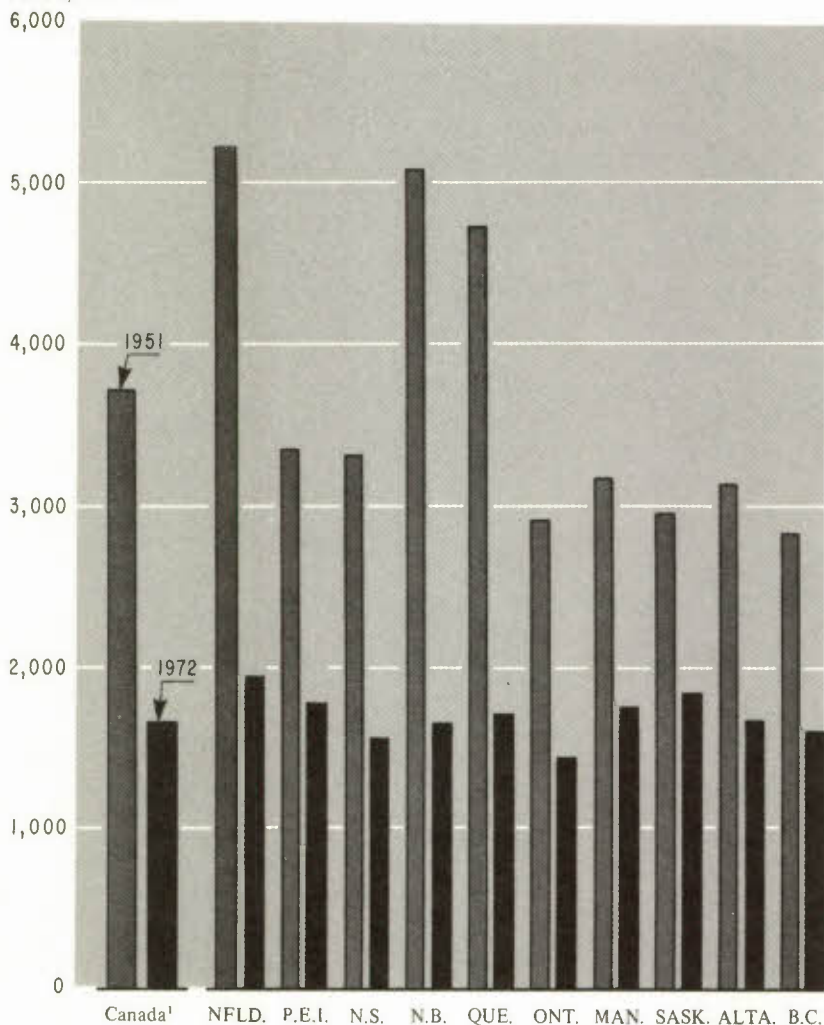
SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

Between 1951 and 1972, the disparity in infant mortality rates between the provinces diminished (Chart 4-3). In 1951, Newfoundland, New Brunswick, and Quebec had the highest rates and, between then and 1972, these provinces showed the largest percentage declines. Nonetheless, Newfoundland still has the highest infant mortality rate – 1,985 per 100,000

Chart 4-3

**Infant Mortality Rate, Excluding Accidental and Violent Deaths,  
Canada, by Province, 1951 and 1972**

Per 100,000 live births



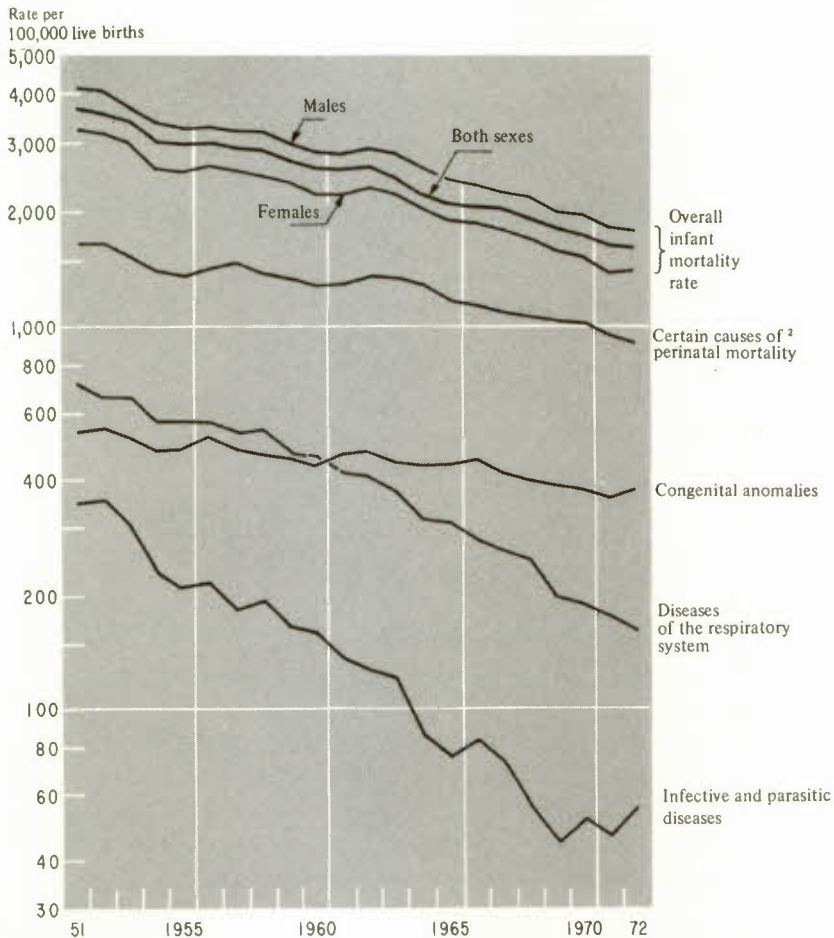
<sup>1</sup> Including Yukon and Northwest Territories.

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

in 1972. Ontario and British Columbia are among the provinces with the lowest rates in both years – 1,448 and 1,606, respectively, in 1972. Saskatchewan showed the greatest change in relative rank; it had one of the lowest infant mortality rates in 1951 and one of the highest in 1972.

Chart 4-4 shows the evolution between 1951 and 1972 of the individual rates of the four principal causes of infant mortality, which together

**Chart 4-4**  
**Evolution of Certain Causes of Infant Mortality,<sup>1</sup> 1951-72**



<sup>1</sup> Excluding accidental and violent deaths. Data for the various causes pertain to both males and females.

<sup>2</sup> This category includes mortality resulting from birth injuries and difficult labour, conditions of the placenta, haemolytic diseases of the newborn child, and certain anoxic and hypoxic conditions.

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



accounted for 95 per cent of the infant deaths in 1972. Overall, considerable progress has been made in reducing infant mortality associated with certain exogenous causes, such as infective and parasitic diseases or diseases of the respiratory system.

The infant mortality rate (excluding accidental and violent deaths) was projected to 1985 (see Table A-8). If the trends of the past continue, the rate of infant deaths per 100,000 live births will decrease from 1,624 in 1972 to 1,419 in 1977, to 1,209 in 1981, and to 1,014 in 1985. This projection can be regarded as a benchmark, allowing us to observe the degree to which society is successful in reducing the infant mortality rate below the projected rates. When accidental and violent deaths are included in the calculation of the infant mortality rate for 1985, the rate is about the same as that already achieved by Sweden and Norway in 1971.

In an attempt to determine some of the factors associated with changes and distributional differences in the infant, neo-natal, and post-neo-natal infant mortality rates, several essentially demographic variables were tested. The changes in these rates for Canada as a whole since 1949 were not found to be associated in any statistically significant way on this aggregate level with variables such as decreases in the age of the parents of newborn children, the average size of families into which children are born, and the proportion of children born live in multiple births. The one variable that was found to be significantly and positively associated with the decreasing infant mortality rate was a proxy for the proportion of live births to mothers who have previously had stillbirths.<sup>14</sup>

An initial attempt was also made to determine some of the socio-economic and environmental factors associated with infant mortality. To this end, the average infant mortality rates for seven hundred cities, towns, and villages for the 1959-63 period were analysed in relation to a series of potential explanatory variables.<sup>15</sup> Several interesting preliminary results emerged.

The urban areas with the lowest infant mortality rate tend to be those with the lowest percentage of families living below the poverty line and those with the highest percentage of mothers with more than primary school education. The significance of these two variables, which are reasonable representations of the general socio-economic conditions in a given urban area, suggests that one of the factors underlying the decline in infant mortality since 1951 is probably the general improvement in the levels of living enjoyed by much of the Canadian population.

14 The variables employed are described in more detail in Appendix A.

15 The cities, towns, and villages chosen were determined by those municipalities for which data on the hardness of water exist. The variables discussed here were tested together and in various combinations. Accidental and violent deaths were excluded from the calculation of the infant mortality rates.

In general, the municipalities that were part of one of the seventeen metropolitan areas in 1961, or were within twenty-five miles of these metropolitan areas, tended to have significantly lower infant mortality rates than smaller or more isolated urban areas.<sup>16</sup> This is probably indicative of, among other matters, the greater availability and easier access to various health care facilities and personnel enjoyed by those living in or near these major metropolitan areas.

The infant mortality rate tended to be lowest for those urban areas with the highest proportion of gynecologists and obstetricians relative to the number of women in the 15-44 age group (or to the total population). The proportion of pediatricians to liveborn infants, and the proportion of general practitioners or specialists (other than gynecologists, obstetricians, and pediatricians) to the population were not significantly associated with the overall infant mortality rate.<sup>17</sup> In treating these variables the proximity of the municipalities to other urban areas was taken into account.

Further, there is a positive association between the proportion of premature liveborn infants and the infant mortality rate. It is generally accepted that the proportion of premature births can be reduced by more-generalized early prenatal care, by better maternal diet, by the avoidance of excessive fatigue, and by other factors.

Additional environmental aspects, certain hospital variables, and other potentially relevant factors are being examined. For example, initial analytical results indicate that lower rates of infant mortality tend to be found in urban areas in which the drinking water is hard (over 250 parts per million carbonate). Further work will be done to determine the variables associated with certain components of the infant mortality rate — such as the neo-natal mortality rate, the mortality rate resulting from congenital anomalies, and others. Analyses will also be done to determine the factors that were associated with the average infant mortality rates of the urban areas during the 1968-72 period. The variables employed in the analysis of the earlier period plus certain additional variables will be examined.

In conclusion, we propose that the infant mortality rate (excluding accidental and violent deaths) be regarded as a second principal health indicator. Neo-natal and post-neo-natal mortality rates can be regarded as supplementary indicators.

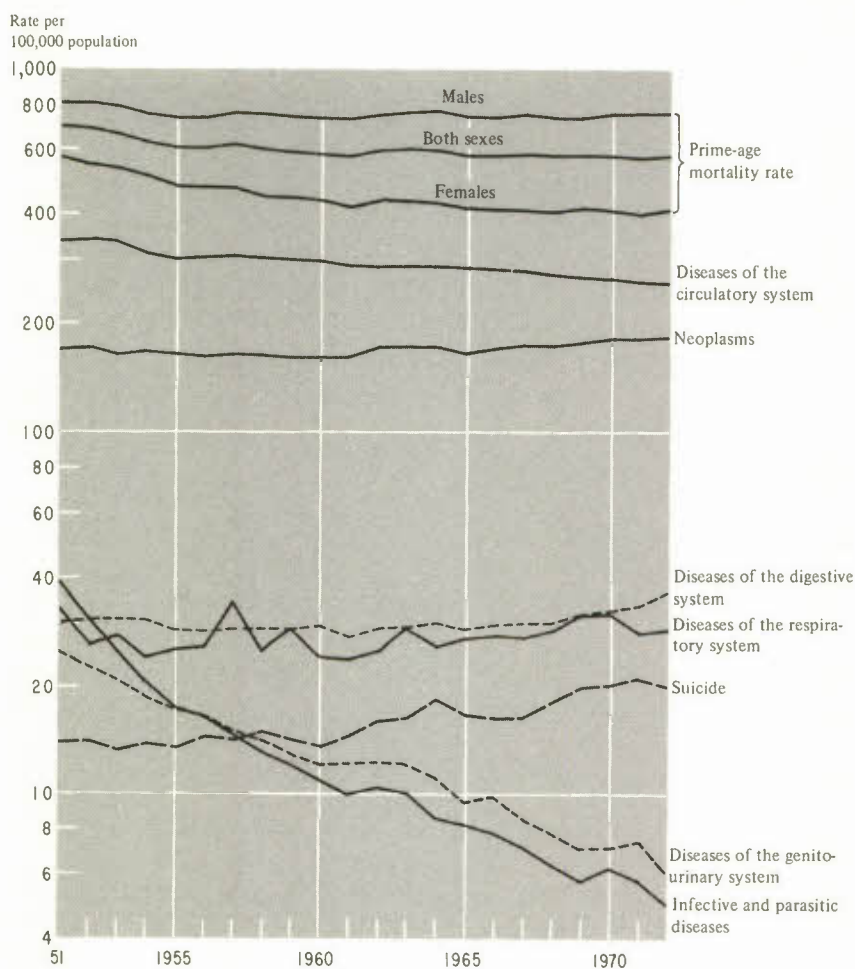
16 The distance of twenty-five miles was determined analytically.

17 This does not mean that they are not important for particular aspects of infant mortality. For instance, the infant mortality rate for respiratory diseases tends to be lower in those urban areas with a higher proportion of general practitioners to population.

### Prime-Age Mortality

Relatively few people die because of illness during childhood, adolescence, or young adulthood. From about the age of thirty-five on, however, certain important health-related causes of mortality, such as neoplasms and circulatory diseases, begin to increase the mortality rates significantly.

**Chart 4-5**  
**Evolution of Certain Causes of Prime-Age Mortality, 1951-72**



1 Prime-age mortality refers to deaths of those in the 35-64 age group, excluding accidental and violent deaths, except suicide. Data for the various causes pertain to both males and females.

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

In 1972 there were approximately 40,000 deaths in the 35-64 age group, excluding accidental and violent deaths. The economic and social importance of this phenomenon is considerable, as it reduces the number of experienced and productive people contributing to the functioning of our society.

For this reason, we believe it appropriate to propose a third indicator for health – namely, the mortality rate for the 35-64 age group (excluding accidental and violent deaths). However, in further work on prime-age mortality, the 20-34 and 65-and-over age groups will not be overlooked, especially since the latter group's importance as a proportion of the population is expected to increase to between 9.0 and 9.4 per cent in 1981<sup>18</sup> from 8.1 per cent in 1971 and 7.6 per cent in 1961.

The change in rates between 1951 and 1972 for some of the major causes of prime-age mortality is shown in Chart 4-5. The two most important causes were diseases of the circulatory system and neoplasms (cancer and related diseases), and the two that declined the most over this period were diseases of the genito-urinary system, and infective and parasitic diseases. The total prime-age mortality rate (excluding accidental and violent deaths) decreased by only about 16 per cent between 1951 and 1972 (from 703 per 100,000 for this age group to 591), with the rate for women decreasing much more than for men (about 28 per cent versus 7 per cent). This differential is one of the underlying factors associated with the growing discrepancy in life expectancy between the sexes. The greater reduction in the rate for women is a pervasive phenomenon, rather than being related largely to a specific cause.

### AN ENVIRONMENTAL INDICATOR

In attempting to develop environmental indicators, we have chosen at present to concentrate on an indicator of *urban air quality* rather than water quality. The reason for this initial emphasis is simply that exposure to certain impurities in water attributable to man-made pollution, though undesirable, costly, and inconvenient, can often be avoided (for instance, one does not have to swim in polluted water); however, impurities in the air we breathe cannot be avoided.

#### Urban Ambient Air Quality

Although air pollution transcends regional and even national boundaries, the most immediate and apparent impact of airborne pollutants is upon urban areas, where the effects of large-scale production and consumption impinge upon a large portion of the Canadian population. The first approxi-

18 J. Yam, *The Age-Sex Structure of Canada's Population: A Compendium of Selected Data*, Statistics Canada, Analytical and Technical Memorandum No. 9, January 1974.



mation of an indicator for urban air quality proposed here is an aggregate index that incorporates measures of the concentration of pollutants in the ambient air of those urban centres for which sufficient data are available, the potential population at risk in these urban areas, and the relative "severity factors" for the pollutants.

The indicator contains measures of the concentrations in ambient air of five pollutants: total oxidants, nitrogen oxides, carbon monoxide, sulphur dioxide, and particulate matter. A sixth factor referred to as "synergism" is also included in the indicator; it measures the generally recognized negative effects of the combined presence of sulphur oxides and particulate matter, over and above the sum of the effects of each of these pollutants alone.

There are other airborne pollutants besides the ones used here, but either the available data are relatively limited or the effects of these pollutants are not well understood. However, it is believed that the air pollutants used in constructing the urban air quality indicator probably have the greatest impact on the environment; they also may incorporate some of the impact of omitted pollutants.

The relative severity factors used in formulating this indicator are those derived from the 24-hour air quality criteria employed by the Ontario Ministry of the Environment.<sup>19</sup> These criteria represent the highest average concentrations of the individual pollutants, over a 24-hour sampling period, still consistent with acceptable ambient air quality. At higher concentrations there is believed to be a significant negative impact on the environment. The severity factors are derived from these criteria and indicate the approximate relative impact on human health and well-being of each of the pollutants at the same concentration, thus providing a common base for purposes of comparison (see Table A-9). The relative severity factors – total oxidants, 267; nitrogen oxides, 80; sulphur dioxide, 80; particulate matter, 8; and carbon monoxide, 1 – are broadly consistent with our analytical findings, which are discussed briefly in Appendix A.

Eleven cities for which the appropriate data were available are used in the construction of the urban air quality indicator. These cities contained nearly 60 per cent of the people living in urban centres with a population of 10,000 or more in 1971; thus they represent a reasonable sample upon which to build a first-approximation measure. As data become available for more urban centres, these can be added to build a more complete indicator.

Pollution indexes for these cities are shown in Table 4-13 for 1971, 1972, and 1973 (on a per capita basis); they take account of the relative severity factors and the observed average ambient air concentrations for

19 Ontario Ministry of the Environment, *Air Quality Monitoring Report, Ontario, 1971*, vol. 1 (1971), Table 2.



the five pollutants, and they also include the effects of sulphur-oxide/particulate-matter synergism (see Tables A-10, A-11, and A-12). Of the eleven cities in the table, those with the best overall air quality for the three years were Edmonton, Calgary, Sudbury, and London; those with the poorest were Montreal, Windsor, and Hamilton. The city pollution index decreased between 1971 and 1973 for every urban centre except Calgary, and the largest decreases were experienced by Sudbury (58 per cent) and Cornwall (51 per cent). London, Windsor, Hamilton, and Sarnia also experienced notable declines over this period (between 20 and 30 per cent).

**Table 4-13**  
**City Pollution Index, Eleven Cities, 1971-73<sup>1</sup>**

	1971	1972	1973	Average 1971-73	Change 1971-73
	(Impact units per capita)				(Per cent)
Edmonton	11.3	8.2	10.1	9.9	-10.6
Calgary	11.8	9.3	12.6	11.2	+ 6.8
Ottawa-Hull	13.2	18.7	12.0	14.6	- 9.1
London	14.7	11.1	10.4	12.1	-29.3
Sudbury	16.1	11.2	6.7	11.4	-58.4
Toronto	19.3	16.5	16.1	17.3	-16.6
Cornwall	19.6	19.9	9.6	16.4	-51.0
Sarnia	21.2	17.7	16.2	18.4	-23.6
Montreal	25.2	22.7	22.4	23.4	-11.1
Hamilton	25.4	20.3	19.3	21.6	-24.0
Windsor	26.4	20.4	19.9	22.3	-24.6

<sup>1</sup> The formulation of these indexes is explained in Appendix A.

SOURCE Alberta Department of the Environment; Quebec Environmental Protection Service; Ontario Ministry of the Environment; Montreal Urban Community; and estimates by the Economic Council of Canada.

The values of the index ranged from 6.7 for Sudbury to 22.4 for Montreal in 1973. If in any city the average 24-hour concentration of the five pollutants in the ambient air were at all times at the threshold of unacceptability, the value of the index would be 48 (see Table A-9).<sup>20</sup> As might be expected, all cities have lower indexes; however, the concentrations of the various pollutants do not remain stable, varying considerably with meteorological

<sup>20</sup> This figure is obtained by multiplying the relative severity factor by the concentration at criteria for each of the five pollutants (which gives 8 in each case), also taking account of the sulphur-dioxide/particulate-matter synergism, and adding these together.

conditions, season, industrial activity, and other factors. Consequently, the concentration of a pollutant may periodically exceed its criterion, and the percentage of the time it is above this criterion will vary from pollutant to pollutant and from city to city. Table 4-14 shows the percentage of time the concentration of each of the five pollutants was in excess of its criterion for the eleven cities in 1973.<sup>21</sup>

**Table 4-14**  
**Percentage of Days on Which Air Quality Criteria**  
**Were Exceeded, by City and Pollutant, 1973<sup>1</sup>**

	Total Oxidants	Nitrogen Oxides	Carbon Monoxide	Sulphur Dioxide	Particulate Matter
Edmonton	*	11	*	*	*
Calgary	*	19	4	*	2
Ottawa-Hull	12	*2	*2	*	*
London	7	*	*3	*	*
Sudbury	*	*	*2	4	*
Toronto	37 <sup>4</sup>	7 <sup>2</sup>	10	*	2
Cornwall	7	1	*2	*	*
Sarnia	23	*	*	*	*
Montreal	33 <sup>4</sup>	*	2	3	10
Hamilton	34	*3	*	*	6
Windsor	11	*	2	2	2

\*Less than 1 per cent.

1 Using the Ontario Ministry of the Environment 24-hour criteria.

2 Data for 1972.

3 Data for 1971.

4 Based on the measurement of ozone by chemiluminescence, a more precise technique.

SOURCE Alberta Department of the Environment; Quebec Environmental Protection Service; Ontario Ministry of the Environment; Montreal Urban Community; and estimates by the Economic Council of Canada.

The overall pattern suggested by this table is approximately the same as that shown for 1973 in Table 4-13. In both cases, Sudbury, Edmonton, London, and Cornwall were among the cities with the best conditions in 1973, while Montreal and Hamilton were among those with the worst.

- 21 There are a number of technical problems involved in the accurate measurement of the concentrations of total oxidants and nitrogen oxides in ambient air. In general, the techniques presently employed tend to underestimate the concentration of total oxidants. As a result, the impact of total oxidants – and hence most city pollution indexes, except Montreal's – may tend to be underestimated. The wider use of more accurate and specific analyses, such as those employing chemiluminescence, may help to reduce this problem in the future.

Of the pollutants, total oxidants exceeded their criterion a larger percentage of the time than any other pollutant for eight of the eleven cities. Although certain pollutants may only exceed their criteria occasionally in a particular urban centre, this does not mean that these pollutants have little effect on human health and well-being. Our analyses indicate that there can be a significant correlation between respiratory problems and the ambient air concentration of certain pollutants, even when the criteria for these pollutants are seldom violated. Hence, the average concentration of a pollutant may better represent the overall effect of this pollutant on human health and well-being than some measure employing only concentrations in excess of the criterion.

Table 4-15 shows the values of the urban pollutant subindicators for 1971, 1972, and 1973.<sup>22</sup> These subindicators reflect the relative impact of each of the observed pollutants (measured in terms of their average hourly concentrations over the year) on the health and well-being of the population of the eleven cities used in the formulation of this indicator. The values suggest that there has been an overall improvement over this period. Of the six subindicators, five declined; only the one for the nitrogen oxides increased (by 9 per cent).

The urban air quality indicator – that is, the sum of the urban pollutant subindicators for a particular year – is also shown in Table 4-15. The indicator decreased from 166.5 (million impact units) in 1971 to 144.3 in 1973, showing in aggregate form the general improvement in urban air quality exhibited by the component subindicators. Since this indicator changes with both the concentration of pollutants and with population, reflecting in the latter case the effect on society of exposing more people to certain levels of pollution, it is clear that the increase in population in these eleven cities has been far outweighed by generally decreasing concentrations of pollutants in ambient air. The pollutants with the greatest impact on overall ambient air quality in both 1971 and 1973 were total oxidants and carbon monoxide (even though the latter has the lowest relative severity factor, its concentrations in the largest centres were high). In 1973, these two pollutants made up 47 per cent of the indicator.

The urban air quality indicator is also expressed in per capita terms in Table 4-15, reflecting the average effect of pollution on individuals living in the urban areas presently covered by the indicator. On this basis, the indicator declined from 20.4 in 1971 to 17.2 in 1973.

This first-approximation urban air quality indicator should simply be regarded as a barometer that gives some idea of the degree to which, on balance, conditions change over time. It must, however, be treated with certain reservations. To begin with, it has not been possible to

22 See Appendix A for more details on the derivation of these subindicators.

Table 4-15

## Urban Air Quality Indicator and Urban Pollutant Subindicators, 1971-73

	Urban Pollutant Subindicators <sup>1</sup>					Urban Air Quality Indicator <sup>3</sup>	Per Capita Urban Air Quality Indicator
	Total Oxidants <sup>2</sup>	Nitrogen Oxides	Carbon Monoxide	Sulphur Dioxide	Particulate Matter	Synergism	
	(Millions of impact units)						(Impact units per capita)
1971	39.2	24.7	38.8	16.7	30.7	16.3	20.4
1972	35.9	24.4	29.4	15.0	29.3	14.7	17.9
1973	34.9	27.1	33.3	11.7	25.9	11.5	17.2
Change, 1971-73	-11.0	+ 9.7	-14.2	-29.9	-15.6	-29.4	-15.7
	(Per cent)						

1 Summed across the eleven cities for each pollutant; see Tables A-10, A-11, and A-12. The impact units for each pollutant in each city are calculated as follows: (severity factor)  $\times$  (pollutant concentration (ppm))  $\times$  (population of city).

2 The figures for total oxidants are probably underestimated because of the analytical techniques used in most cities.

3 The sum of the urban pollutant subindicators.

SOURCE Statistics Canada; Alberta Department of the Environment; Quebec Environmental Protection Service; Ontario Ministry of the Environment; Montreal Urban Community; and estimates by the Economic Council of Canada.

include certain important urban areas at present. Then there is uncertainty about the importance of the unmeasured pollutants. Further, there is some question about the extent to which the placement of the monitoring stations and the equipment employed truly capture the ambient air quality for the community. Finally, the air quality criteria from which the relative severity factors are derived do not rest on a well demonstrated base, and other criteria may prove to be more accurate.<sup>23</sup>

Nonetheless, in spite of these problems, building such an indicator based on the effects of certain pollutants in ambient air on human health and well-being allows a general overview of the quality of urban air that goes beyond what would be captured by the simple measurement of one or two pollutants. This indicator provides a basis for comparing urban areas, the relative impact of certain important pollutants, and the trends in urban air quality over time. When linked appropriately with emission inventories and costs of abatement, it will also provide a framework for formulating policies and priorities for action with some idea of the trade-offs involved.

### Emissions

The relationship between emissions and the ambient air concentration of pollutants is very complex in nature, and not that much is known about it. For example, the sulphur oxide emissions for Sudbury, Toronto, and Hamilton were roughly in the ratio of 50 to 7 to 1 in 1973, and yet the annual mean concentrations in ambient air were about 1.6 to 1.1 to 1.0; the order of the cities is the same, but there the similarity ends. Differing wind patterns, emission disposal techniques, topography, and other factors may contribute to these discrepancies.

Despite the complex factors that make a direct comparison between pollutant emissions and the concentration of pollutants in ambient air difficult at this time, a knowledge of emissions is essential to air quality control since air pollution can only be corrected at the source. The value of urban and regional emission inventories is that they serve as a check on the effectiveness and efficiency of pollution abatement programs and regulations and as a warning of emerging problems. Emission inventories are necessary on a regional as well as an urban basis since pollutant emissions outside urban centres may, under certain circumstances, have a significant effect on urban ambient air quality. Also, emission inventories should be compiled for individual industries, because the control of emissions by a particular industry may be constrained

23 However, the use of relative severity factors derived from an alternative set of criteria (the one-hour criteria from the Ontario Ministry of Environment) to calculate city pollution indexes for 1971 made very little difference in the relative ranking of the individual cities.



by economic or technical considerations that should be taken into account in the development of pollution abatement programs and regulations.

Over the past few years, there has been progress in pollutant emission abatement, reflecting the effects of government regulations, better pollution abatement equipment and techniques, and certain price changes that have made conservation and recycling more economically attractive. Still, emission inventories employing emission factors that take regulatory, technical, and other matters into account are needed on a frequently updated basis. An example of a summary emission inventory, by source and pollutant, is shown in Table 4-16 for Metropolitan Toronto for the 1969-74 period.

In the following subsections, the emission of various pollutants is discussed with respect to the past and present situation and the future outlook.<sup>24</sup> However, one point should be borne in mind throughout; for a constant technology and set of regulatory requirements, all emissions will tend to increase with growing population and productive capacity. Only technological change, price incentives, and the enforcement of stricter regulations have the power to create a downward perturbation on the basic upward trend of emissions.

#### *Carbon Monoxide and Hydrocarbons*

Table 4-16 indicates that overall carbon monoxide and hydrocarbon emissions fell considerably in Toronto between 1972-73 and 1973-74, largely as a result of the automobile emission standards set for 1973 and later model cars (despite increases in the number of automobiles and in the total vehicle-miles travelled). This pattern is found as well in other cities. In 1970, automobiles were responsible for 75 to 80 per cent of all urban emissions of carbon monoxide and 65 to 70 per cent of all urban hydrocarbon emissions; thus any major attempts to reduce the emission of these two pollutants should focus on the automobile. Chart 4-6 indicates the past and projected trends for automobile emissions in Canada; the projections are based on a continued application of the 1973 standards. Without stricter standards, the emissions of carbon monoxide and hydrocarbons from automobiles are expected to begin to rise again beyond 1980; that is, when the full effects of the 1973 standards have been realized, the continuing impact on emissions caused by the increase in the number of automobiles and vehicle-miles travelled will become apparent once again.

24 Total oxidants are not discussed since these tend to be formed in the atmosphere rather than emitted, although their formation is associated, to a considerable extent, with the presence of nitrogen oxides and hydrocarbons.

**Table 4-16**  
**Emission Inventory Summary, by Source and Pollutant,**  
**Metropolitan Toronto, 1969-74**

	Year	Sulphur Dioxide	Particulate Matter	Nitrogen Oxides	Carbon Monoxide	Hydro- carbons
(Thousands of tons)						
Thermal generating stations	1969-70	246.2	10.8	63.8	1.6	0.6
	1970-71	246.2	10.8	63.8	1.6	0.6
	1971-72	191.4	3.3	53.3	1.2	0.5
	1972-73	190.7	3.7	43.8	2.1	1.4
	1973-74	190.7	3.7	43.8	2.1	1.4
Automobiles	1969-70	1.8	2.4	22.3	427.4	64.8
	1970-71	1.8	2.4	22.1	418.7	64.0
	1971-72	2.0	2.6	24.6	462.8	71.1
	1972-73	2.0	2.6	24.6	462.8	71.1
	1973-74	2.0	2.6	36.1	370.3	53.0
Other trans- portation	1969-70	0.8	1.4	1.8	1.5	6.1
	1970-71	0.8	1.3	2.0	1.5	6.1
	1971-72	0.8	1.3	2.0	1.5	6.1
	1972-73	0.8	1.3	2.0	1.5	6.1
	1973-74	0.8	1.3	2.0	1.5	6.1
Heating	1969-70	40.1	6.9	18.6	3.4	1.2
	1970-71	25.3	3.6	11.0	1.1	0.7
	1971-72	24.4	4.2	12.3	1.7	0.8
	1972-73	23.2	4.2	12.3	1.7	0.8
	1973-74	21.0	4.3	12.2	1.2	1.1
Other industries and utilities	1969-70	31.8	17.6	13.5	2.9	21.5
	1970-71	19.3	14.5	10.4	4.8	21.4
	1971-72	11.7	10.9	10.9	4.6	23.3
	1972-73	10.3	10.8	10.3	4.7	22.9
	1973-74	10.8	9.5	12.0	4.1	22.2
Total	1969-70	320.7	39.1	120.0	436.8	94.2
	1970-71	293.4	32.6	109.3	427.7	92.8
	1971-72	230.3	22.3	103.1	471.8	101.8
	1972-73	227.0	22.6	93.0	472.8	102.3
	1973-74	225.3	21.4	106.1	379.2	83.8

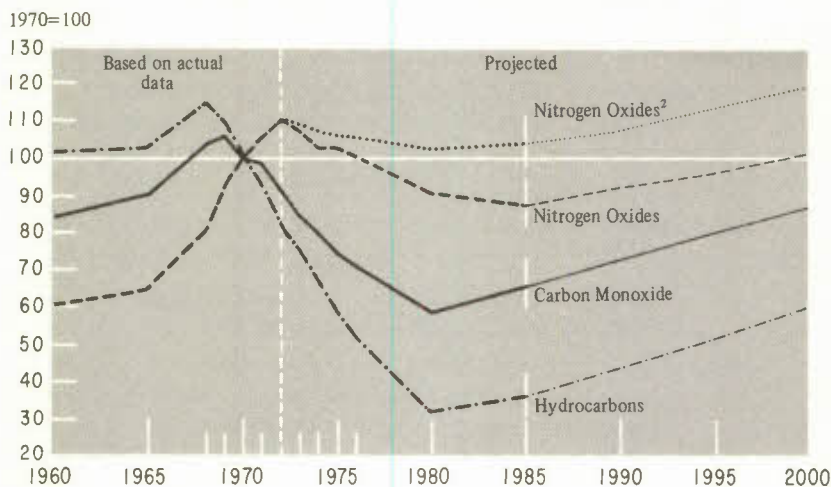
NOTE Actual years are from October 1969 to September 1970; the year ending August 1971; year ending December 1972; year ending March 1973; and year ending March 1974.

SOURCE Based on data from the Ontario Ministry of the Environment.

### *Nitrogen Oxides*

Automobiles and power generation activities are the major sources of nitrogen oxide emissions, as illustrated in Table 4-16 for Toronto. At present, however, there are no automotive emission controls specific

Chart 4-6

Index of Automobile Emissions, 1960-2000<sup>1</sup>

1 Based on 1973 emission standards.

2 Estimated by the Economic Council of Canada, assuming relatively higher compression ratios.

SOURCE: Environment Canada, *Automobile Emission Trends in Canada, 1960-1985* (Ottawa: Information Canada, 1973), and estimates by the Economic Council of Canada.

to this pollutant. The Environment Canada projections in Chart 4-6 suggest that nitrogen oxide emissions from automobiles should decline between now and 1980; this projected reduction is associated with the introduction of engines with lower compression ratios designed to accommodate low-lead fuels, and with the equipment introduced to meet 1973 emission standards for carbon monoxide and hydrocarbons.<sup>25</sup> However, Table 4-16 shows that nitrogen oxide emissions from automobiles actually increased considerably at the same time that carbon monoxide and hydrocarbon emissions decreased (1973-74). Furthermore, it does not seem entirely realistic, given resource supply and price constraints, to anticipate a continuation of the trend towards greater use of less efficient engines with lower compression ratios. As is shown in Chart 4-6, we expect a somewhat higher future level of nitrogen oxide emissions from automobiles than projected earlier. Nitrogen oxide emissions from other sources may also increase as a result of the greater utilization of diesel motor power and the increased efficiency and temperature of fuel combustion by stationary sources. Because of the high relative severity factor assigned to this pollutant and because of its major role as an

25 Higher temperature and more efficient combustion of carbon compounds is generally associated with an increase in nitrogen oxide emissions.

ingredient in the formation of oxidants, the means to control its emission deserve greater technical and policy consideration.

### *Sulphur Oxides*

In the country as a whole, the bulk of sulphur oxide emissions is generated by the smelting and refining associated with the production of copper and nickel; other significant emission sources include pulp mills; and aluminum, primary lead, and zinc smelters and refining plants. Most of these sulphur oxide emissions have only a limited effect on most major urban areas since many of the industrial activities responsible for them are located in smaller centres remote from large urbanized regions. The sulphur oxide emissions that affect major urban centres come from power generation stations, industrial processes and fuel consumption, and commercial and residential heating (see Table 4-16). Over the past few years, sulphur oxide emissions in major centres declined for a variety of reasons including the enforcement of certain pollution regulations, the substitution of natural gas for oil and coal, and the use of low-sulphur fuel oils instead of those with higher sulphur content for coal. However, energy conservation considerations may lead to the use of higher-sulphur-content fuels for energy generation over the course of the next few years. Unless relatively expensive sulphur recovery facilities are installed at the source of major emissions, or unless sulphur removal techniques are applied to a greater extent to fuels before burning, sulphur oxide emissions in major urban areas may start to increase again at some point between now and 1980.

### *Particulate Matter*

While the equipment necessary to remove sulphur oxides from flue gases or sulphur from fuels is expensive, the equipment required to reduce particulate matter emissions – such as electrostatic precipitators and bag collectors – is relatively inexpensive. As a consequence, the emissions of particulate matter in major urban areas have decreased over time, and this trend is expected to continue to 1980, even if “dirtier” fuels, such as coal, are employed to a greater extent in power generation and industrial operations. Existing and potential regulations with respect to particulate-matter emissions will tend to reinforce this trend. However, the reduction in particulate-matter emissions is more effective for large (more than one micron) particles than for smaller particles, and it is these smaller particles that may have the greater impact on human health and well-being.

\* \* \*

In general, there is some correspondence between the trends in pollutant emissions and changes in the quality of ambient air for the eleven urban

centres covered by the indicator. For instance, Table 4-16 and the discussion above would lead us to expect the observed decline in the ambient air concentrations of sulphur dioxide and particulate matter. However, a great deal more needs to be learned about the way in which emissions and ambient air concentrations of pollutants are associated if pollution abatement programs are to be both effective and efficient. Two ingredients essential to any increased understanding of their relationship are a more extensive urban ambient-air monitoring system, and detailed inventories of emissions, frequently updated.



## 5

### *Energy Development in the 1970s and Early 1980s*

The problem of ensuring adequate and secure future supplies of energy in Canada is not a new one, nor did it begin with the events of late 1973, when Arab oil producers imposed a selective embargo and crude oil prices were increased at unprecedented rates. These actions of the major oil-producing countries have, however, forced Canadians to re-examine their plans for development of their energy resources, to revise policy, and to implement new measures at a pace in line with the ever-changing international situation.

Future world and domestic demand, supply, and prices for oil, gas, and alternative forms of energy are still uncertain. Yet it is clear that they will play a major role in determining the character of Canadian growth and the distribution of economic activity among industries and regions. The presence of such major uncertainties in the energy outlook poses an awkward problem for those involved in planning and those making decisions for the future. It is evident that the probability of any single preconceived pattern of future development actually being realized is rather low. In these circumstances, it is much more useful to examine a number of "scenarios" representing what are presently discerned as major alternative patterns of development. The process of making the various alternatives and their implications explicit helps to identify some critical policy issues and options.

The energy scenarios outlined in this chapter are intended to provide a starting point for this process of exploring the implications of alternatives. Each scenario has been developed in such a way as to be internally consistent, at least in a qualitative sense. We have assumed that the patterns of energy development and consumption in a primarily market-oriented economy such as ours will depend on the future path of prices for petroleum – the major form of energy – and that the price will be determined internationally. We wish to emphasize that we are not attempting to forecast the price of crude oil. Rather, we are setting out what appear, at time of writing, to be reasonable alternative price paths that will help to illustrate the potential consequences on production, investment, consumption, and the rest of the economy. In a discussion of this length, it is impossible to cover all aspects of the energy situation. The

focus of our interest is, therefore, not so much on energy developments per se but on the economic variables that will be affected by these energy developments and on how these economic variables, in turn, will influence the economy as a whole. The economic aspects of the energy scenarios are discussed in this chapter; Appendix B contains three scenarios for the whole economy to 1982. The differences between these scenarios originate in the different energy price and investment patterns described in this chapter.

The discussion in this chapter falls under three interrelated headings: production and development of existing and potential reserves; investment requirements for energy in the 1970s and 1980s; and the provision of adequate supplies of energy for Canadians in the long run. This includes, of course, such questions as Canada's role as an exporter of crude oil and natural gas, and the effect of the domestic price of crude oil on "economic rents" (defined later in this chapter) and the development of new reserves.

The three scenarios discussed in this chapter may be compared with three of the development options examined in a major document published by the Canadian government.<sup>1</sup> However, because of the rapid price changes in foreign crude oil since this government report was released, the focus of the scenarios in this chapter differs from that of the energy policy study. In this case, we examine specific sets of assumed foreign and domestic prices and the patterns of investment and development associated with them. The cases discussed in *An Energy Policy for Canada* placed more emphasis on different development options and less on rapid changes, as these were not then anticipated.<sup>2</sup>

Since the discussion focuses on the economic aspects of energy development, no space has been devoted to environmental and ecological problems associated with the suggested projects. However, we recognize that such difficulties do exist, and we subscribe to the view that projects that are potentially damaging to the environment should be most carefully examined before being undertaken. The long-term social benefits from each project obviously need to be weighed against the full long-term social costs involved.

1 Department of Energy, Mines and Resources, *An Energy Policy for Canada, Phase 1. Vol. 1: Analysis* (Ottawa: Information Canada, 1973).

2 Although we do not look at the issue of self-sufficiency in energy for Canada, in terms of capital requirements for energy developments, the low-, medium-, and high-price scenarios of this chapter are roughly comparable to the self-sufficient development, standard development, and extensive development cases, respectively, in the study by Energy, Mines and Resources (EMR). Further, the assumed time profile of domestic production of crude oil from conventional sources is approximately the same as the EMR study. Direct comparison of the EMR cases with ours is not possible, as the assumptions behind the two sets of scenarios differ and the simulations using CANDIDE (to look at the effects of such patterns of development on the economy) are based on different control solutions.

While there is a fairly wide range of energy products that could satisfy Canadian consumption requirements, most of the demand is met by petroleum, petroleum products, and natural gas; and their relative positions in Canadian energy consumption are not expected to alter significantly over time (Table 5-1). By the year 2000, it has been estimated<sup>3</sup> that petroleum products and natural gas will together account for 79 per cent of secondary energy consumption; petroleum and natural gas, for 63 per cent of primary energy consumption.<sup>4</sup> Consequently, we focus almost exclusively on these two energy types up to the mid-1980s, recognizing, at the same time, that the development of alternative sources of energy, notably coal and nuclear energy, is of the utmost importance in the provision of adequate longer-term future energy supplies.

Table 5-1  
Canadian Energy Consumption, 1970<sup>1</sup>

	10 <sup>15</sup> BTUs	Per cent
Primary		
Petroleum	3.1	48
Natural gas	1.2	18
Coal	0.7	11
Hydro-electricity <sup>2</sup>	1.5	23
Total	6.5	100
Secondary		
Petroleum products	2.9	58
Natural gas	1.1	22
Coal <sup>3</sup>	0.3	6
Electricity	0.7	14
Total	5.0	100

1 Secondary energy consists of the amount of energy actually available to, and used by, the consumer in its final form. Primary energy is secondary energy plus conversion losses and waste used by the energy supply industries themselves.

2 Hydro-electricity at 10,000 BTUs per kwh.

3 Includes petroleum coke.

SOURCE EMR, *An Energy Policy for Canada, Phase I*, vol. 1, pp. 71-72.

3 EMR, *An Energy Policy for Canada*, pp. 71-72. That study, of course, was completed before the recent large increase in oil prices and therefore would not have taken into account the substitution of other energy sources for oil that is likely to take place as a result.

4 Secondary energy consists of the amount of energy actually available to, and used by, the consumer in its final form. Primary energy is secondary energy plus conversion losses and waste used by the energy supply industries themselves.

### DOMESTIC DEMAND FOR, AND SUPPLY OF, CRUDE OIL AND NATURAL GAS

While Canada is better off than most industrial countries in terms of her ability to satisfy energy requirements through domestic production, her conventional reserves are rapidly declining. Chart 5-1 shows the remaining reserves (proved and probable) of crude oil and natural gas. Of non-conventional sources, there are some 26 billion barrels of presently recoverable synthetic crude oil in the Athabasca Tar Sands. (This compares with 7 billion barrels of recoverable conventional crude in Alberta at the end of 1973.) As well, there is the possibility of discovering new oil fields off Canada's east coast or in the Arctic, along with the development of natural gas reserves in the Mackenzie Delta and in the Arctic. These, however, are much higher-cost sources than the conventional crude and natural gas reserves and will require massive investment, new technologies, and improved transportation techniques.

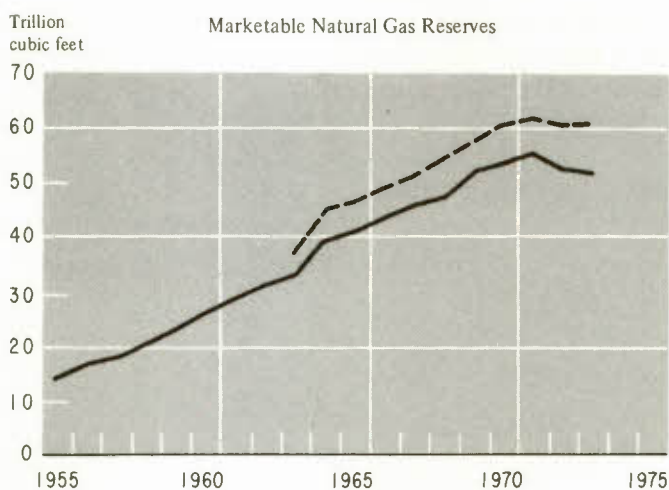
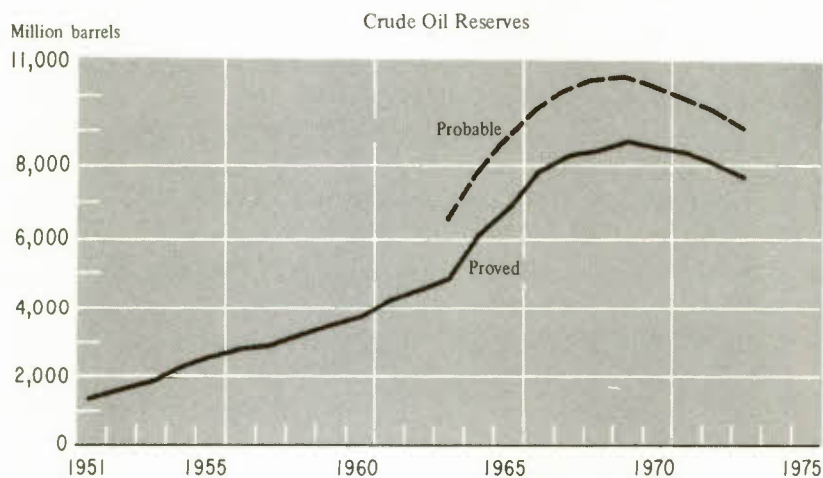
It is important to note that the concept of reserves is a complex one. "Proved reserves" are defined as the estimated quantity of crude oil, natural gas, natural gas liquids, or sulphur that analysis of geological and engineering data demonstrates, with reasonable certainty, to be recoverable from known oil or gas fields under existing economic and operating conditions. "Probable reserves" are defined as a realistic assessment of the reserves that will be recovered from known oil or gas fields, based on the estimated ultimate size and reservoir characteristics of such fields. Changes in price conditions alone can thus alter the reserve estimates, as higher prices allow for recovery of higher-cost resources, such as oil in the Arctic or in places where exploration and production costs are relatively high.<sup>5</sup> Therefore some caution should be exercised in interpreting the significance of given reserve levels.

Canada currently imports approximately one-half of her domestic requirements of crude oil – mainly from Venezuela and the Middle East – and exports an equal, or slightly greater, amount to the United States. This situation is a result of the National Oil Policy, adopted in 1961, which aimed at stimulating a larger output for Canadian crude by securing a larger portion of the Canadian market and encouraging exports to the United States. The area west of the Ottawa Valley line was reserved for Canadian oil, while Quebec and the Atlantic Provinces imported their petroleum, which was then available at much lower prices. While Canada statistically has the reserves to be self-sufficient in crude oil (at least over the short run), the necessary transportation system does not exist, and transport costs may be too high to make complete self-sufficiency a viable

<sup>5</sup> For a discussion of varying reserve estimates, see EMR, *An Energy Policy for Canada*, section 2, chapter 4.



**Chart 5-1**  
**Oil and Gas Reserves in Canada, 1951-73<sup>1</sup>**



<sup>1</sup> Probable reserves include those shown in the proved category.

SOURCE Canadian Petroleum Association, *Statistical Year Book*, 1972, p. 26.



goal. The natural gas situation is somewhat different in that, of a total production of 2,451 billion cubic feet in 1973, 1,028 billion cubic feet (or 41.9 per cent of production) were exported, while imports totaled only 15 billion cubic feet.

### Crude Oil

Table 5-2 shows imports and exports of crude oil, condensates, and pentanes plus,<sup>6</sup> for 1973, as well as Canadian production and consumption figures. Main sources of crude oil imports are: Venezuela (approximately 45 per cent of all imports), Iran (17 per cent), Saudi-Arabia and other Middle East countries (20 per cent), and Africa (10 per cent), while Canada exports to U.S. Districts I, II, IV, and V.<sup>7</sup> While 1973 was by no means an "average" year, these figures indicate the complex nature of Canadian production of, and trade in, crude oil.

**Table 5-2**  
**Canadian Supply and Disposition of Crude Oil,**  
**Condensates, and Pentanes Plus, 1973**

Supply	Millions of Barrels	Disposition	Millions of Barrels
Production	716.5	Consumption	612.1
Imports	311.8	Exports	414.2
		Inventory change	
		Other losses, and adjustments	2.0
Total supply	1,028.3	Total disposition	1,028.3

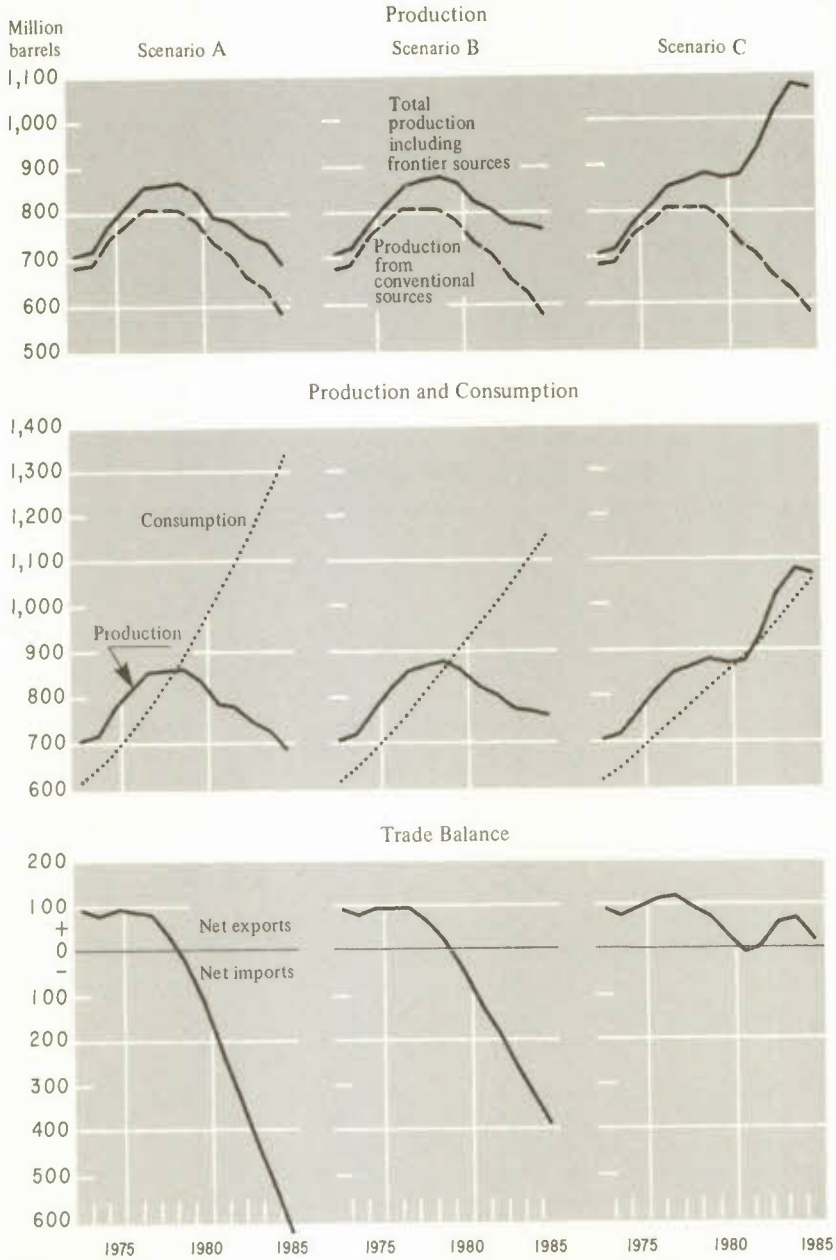
SOURCE Based on data from Statistics Canada.

Three contrasting patterns of possible development of Canadian conventional and frontier sources of crude oil are presented below (Table 5-4 and Chart 5-2). Each scenario assumes a different price for domestic

6 The Canadian Petroleum Association defines "condensate" as "a mixture mainly of pentanes and heavier hydrocarbons that may be contaminated with sulphur compounds, that is recovered or recoverable at a well from an underground reservoir that is gaseous in its virgin reservoir state but is liquid at the conditions under which its volume is measured or estimated." "Pentanes plus" is defined as "a mixture mainly of pentanes and heavier hydrocarbons which ordinarily may contain some butanes and which is obtained from processing of raw gas, condensate or crude oil."

7 These districts are known as Petroleum Administration Districts, established in the United States for the distribution of crude oil and the allocation of import quotas on crude oil and refined products. Import figures are based on data from Statistics Canada.

**Chart 5-2**  
**Crude Oil Scenarios, 1973-85**



SOURCE Table 5-4.

and international crude oil, ranging from a domestic wellhead price of \$6.00/barrel in the late 1970s in the case of the low-price scenario to \$8.50/barrel<sup>8</sup> in the same period in the case of the high-price scenario.<sup>9</sup> All three cases assume that the federal export tax will be lowered in 1975 and that Canada will not be faced with difficulties in securing the imports of crude oil postulated in each scenario.<sup>10</sup>

In Table 5-3, some of the key differences between the three scenarios are set out in summary form. With low prices, output tends to decline, and consumption to grow rapidly. With high prices, output is stimulated and consumption is retarded. Other things being equal, such as the capacity of the pipeline from Sarnia to Montreal, a further difference between the scenarios is the volume of imports and exports of crude oil.

**Table 5-3**  
**Average Annual Rate of Change in Output and Consumption of Crude Oil**  
**in Three Different Price Scenarios, Canada, 1973-85**

	A	B	C
	Low Price	Medium Price	High Price
	(Per cent)		
Output	-0.2	0.6	3.6
Consumption	6.8	5.4	4.6

The first scenario is associated with a low international price of \$6.00 per barrel in 1976, in comparison with the other two scenarios. Because domestic and international prices are assumed to be relatively low, tar sands development in this case has been limited to two new plants by 1985. The result of the high average annual growth of consumption (6.8 per cent per annum) is that Canada becomes a net importer by 1979 (as indicated in Table 5-4 by taking advantage of the difference between

8 This should not be viewed as any limit to the level of the international f.o.b. price, but rather as a high price relative to the other two scenarios.

9 After 1980, as growth in demand approaches production capacity, price increases are postulated to resume. The rate of increase in the price of crude oil is in line with other estimates for increases in trade prices over the 1980-85 period.

10 Because of the high degree of uncertainty about both current and future oil prices, we are aware that our estimates may be quickly outdated. However, this should not detract from the purpose of presenting these scenarios, which is to show alternative development patterns associated with relatively low, medium, and relatively high crude oil prices. The average unit value of imports of crude oil, valued f.o.b. at point of export, was about \$8.00 per barrel in the first half of 1974. The average for the whole of this year seems likely to be higher.

import and export availability). The export availability resulting from a given level of production from conventional sources, and a consumption and import trend of 6.8 per cent per annum, becomes negative in 1984. This implies that Canada not only would have no crude oil available for export, but would also be forced to increase imports further in order to satisfy domestic demand requirements.

In each of the three cases, the "import trend" and consumption grow at the same rate. The Montreal pipeline is assumed to begin deliveries of western crude to the East by 1976; and this factor, along with others affecting the marketing of domestic crude oil (domestic shifts), is taken into account in determining actual estimated import requirements. The export availability in each scenario is not an indication of demand for exports; rather it shows Canada's potential for exports in each case, given production, consumption, and imports (for example, a reduction in imports implies a reduction in export availability).

The second scenario, which is associated with domestic and international prices of \$7.00/barrel by 1976, postulates relatively moderate development of the Athabasca tar sands, resulting in four additional plants of a capacity of 100,000 barrels/day by 1985. The output of oil from conventional sources is the same as for the other two scenarios. It is assumed that the "low price" level is high enough to stimulate maximum production from conventional producing areas. Consumption is assumed to increase at an average annual rate of 6 per cent from 1974 to 1980 and at 5 per cent per annum thereafter. Canada becomes a net oil importer by 1980.

The third scenario, with domestic and international prices of \$8.50/barrel by 1976, assumes an annual growth in domestic consumption of only 4.5 per cent from 1976 on. Rapid development of the tar sands is assumed, with eight synthetic crude oil plants of 100,000 barrels/day, each operating at capacity by 1985. A new oil field is shown to begin production in 1981 and is assumed to be located in an area easily accessible to major Canadian markets (i.e., without requiring construction of an Arctic pipeline). Under these assumptions, Canada is more or less self-sufficient in oil to 1985. The assumption that the eight synthetic crude oil plants would be working at capacity by 1985 would require exceptional, if not extraordinary, effort. It is likely that bottlenecks in obtaining the necessary labour and material supplies, along with considerations of environmental protection, would make this rapid development quite difficult to attain.

The scenarios are intended only to illustrate three hypothetical paths of production and consumption of crude oil under three hypothetical sets of prices. They show the potential for exports, given these assumptions regarding prices and import availability, and the production and consumption patterns resulting from the price assumptions. The capital requirements implicit in the three scenarios are discussed below.

Table 5-4  
Volumes and Prices for Crude Oil Scenarios, 1973-85

Scenario A (Low Price)

Volume	Output from Conventional Sources +		Tar-Sands Output =	Total Output (3)	Import Trend (4)	Domestic Shifts <sup>1</sup> =		Estimated Imports (6)	Total Availability (3) + (6) (7)	Estimated Consumption = (8)	Export Availability <sup>2</sup> (9)
	(1)	(2)				(5)	(5)				
							(Millions of barrels)				
1973	675	25		700	330	—		330	1,030	610	420
1974	680	30		710	350	(75)		275	985	635	350
1975	740	30		770	370	(100)		270	1,040	675	365
1976	770	40		810	396	(100)		296	1,106	722	384
1977	800	50		850	424	100		324	1,174	772	402
1978	800	52		852	454	125		329	1,181	826	355
1979	800	55		855	486	125		361	1,216	884	332
1980	775	58		833	520	145		375	1,208	946	262
1981	725	62		787	556	165		391	1,178	1,012	166
1982	700	73		773	595	180		415	1,188	1,083	105
1983	650	91		741	637	200		437	1,178	1,159	19
1984	625	100		725	682	220		462	1,187	1,240	-53
1985	575	110		685	730	240		490	1,175	1,327	-152



	Domestic Wellhead	Export Tax <sup>3</sup>	International Price, f.o.b. <sup>3</sup>
Price		(Dollars per barrel)	
1973	3.65	—	2.85
1974	5.90	4.20	8.50
1975	6.50	3.10	8.00
1976	6.00	1.40	6.00
1977	6.00	1.40	6.00
1978	6.00	1.40	6.00
1979	6.00	1.40	6.00
1980	6.00	1.40	6.00
1981	6.30	1.40	6.30
1982	6.62	1.40	6.62
1983	6.95	1.40	6.95
1984	7.29	1.40	7.29
1985	7.66	1.40	7.66

1 This column represents all measures that shift domestic crude oil to Canadian consumption, including the Sarnia-Montreal pipeline, transport by tanker, and export limitation.

2 Because export availability turns negative in 1984 and 1985, no oil can be exported, and estimated imports must be increased by these amounts (i.e., 53 million barrels in 1984 and 152 in 1985).

3 The international price is a weighted average of f.o.b. import prices. From 1976 on, the export tax represents the difference between the cost of transporting oil from the Middle East and from Alberta to Chicago. The landed price at Chicago from each source is assumed to be the same. For example, in 1976 we assume that the price paid for Canadian crude in Chicago will equal \$6.00 plus \$1.40 export tax plus transport costs from Alberta. This should be equal to the cost of international oil — \$6.00 plus transport costs to Chicago.

Table 5-4 (cont'd.)

## Scenario B (Medium Price)

Volume	Output from Conventional Sources +		Tar-Sands Output =	Total Output (3)	Import Trend (4)	Domestic Shifts <sup>1</sup> =		Estimated Imports (6)	Total Availability (3)+(6) (7)	Estimated Consumption =		Export Availability (9)
	(1)	(2)				(5)	(5)			(8)	(8)	
							(Millions of barrels)					
1973	675	25		700	330	—		330	1,030	610		420
1974	680	30		710	350	(75)		275	985	635		350
1975	740	30		770	370	(100)		270	1,040	675		365
1976	770	40		810	395	(100)		295	1,105	715		390
1977	800	50		850	415	100		315	1,165	755		410
1978	800	60		860	440	125		315	1,175	800		375
1979	800	70		870	470	125		345	1,215	850		365
1980	775	80		855	495	145		350	1,205	900		305
1981	725	90		815	520	165		355	1,170	945		225
1982	700	100		800	545	180		365	1,165	990		175
1983	650	120		770	575	200		375	1,145	1,040		105
1984	625	140		765	605	220		385	1,150	1,095		55
1985	575	180		755	635	240		395	1,150	1,150		0

	Domestic Wellhead	Export Tax <sup>4</sup>	International Price, f.o.b. <sup>4</sup>
Price		(Dollars per barrel)	
1973	3.65	—	2.85
1974	5.90	4.20	8.50
1975	6.50	3.60	8.50
1976	7.00	1.40	7.00
1977	7.00	1.40	7.00
1978	7.00	1.40	7.00
1979	7.00	1.40	7.00
1980	7.00	1.40	7.00
1981	7.35	1.40	7.35
1982	7.72	1.40	7.72
1983	8.11	1.40	8.11
1984	8.52	1.40	8.52
1985	8.95	1.40	8.95

<sup>4</sup> The international price is a weighted average of f.o.b. import prices. From 1976 on, the export tax represents the difference between the cost of transporting oil from the Middle East and from Alberta to Chicago. The landed price at Chicago from each source is assumed to be the same. For example in 1976 we assume that the price paid for Canadian crude oil in Chicago will equal \$7.00 plus \$1.40 export tax plus transport costs from Alberta. This should be equal to the cost of international oil - \$7.00 plus transport costs to Chicago.

Table 5-4 (concl'd.)

## Scenario C (High Price)

Volume	Output from Conventional Sources	Tar-Sands Output +	New Oil Field	Total Output =	Import Trend	Domestic Shifts <sup>1</sup>	Estimated Imports =	Total Availability (4)+(7)	Estimated Consumption -	Export Availability
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					(Millions of barrels)					
1973	675	25		700	330	—	330	1,030	610	420
1974	680	30		710	350	(75)	275	985	635	350
1975	740	30		770	370	(100)	270	1,040	675	365
1976	770	40		810	385	(100)	285	1,095	705	390
1977	800	50		850	405	100	305	1,155	735	420
1978	800	64		864	420	125	295	1,159	770	389
1979	800	73		873	440	125	315	1,188	805	383
1980	775	91		866	460	145	315	1,181	840	341
1981	725	110	35	870	480	165	315	1,185	880	305
1982	700	146	75	921	505	180	325	1,246	920	326
1983	650	183	185	1,018	530	200	330	1,348	960	388
1984	625	256	190	1,071	550	220	330	1,401	1,005	396
1985	575	292	200	1,067	575	240	335	1,402	1,050	352

	Domestic Wellhead	Export Tax <sup>5</sup>	International Price, f.o.b. <sup>5</sup>
	(Dollars per barrel)		
Price			
1973	3.65	—	2.85
1974	5.90	4.20	8.50
1975	6.50	3.60	8.50
1976	8.50	1.40	8.50
1977	8.50	1.40	8.50
1978	8.50	1.40	8.50
1979	8.50	1.40	8.50
1980	8.50	1.40	8.50
1981	8.93	1.40	8.93
1982	9.38	1.40	9.38
1983	9.85	1.40	9.85
1984	10.34	1.40	10.34
1985	10.86	1.40	10.86

<sup>5</sup> The international price is a weighted average of f.o.b. import prices. From 1976 on, the export tax represents the difference between the cost of transporting oil from the Middle East and from Alberta to Chicago. The landed price at Chicago from each source is assumed to be the same. For example, in 1976 we assume that the price paid for Canadian crude in Chicago will equal \$8.50 plus \$1.40 export tax plus transport costs from Alberta. This should be equal to the cost of international crude — \$8.50 plus transport costs to Chicago.



## Natural Gas

There are three scenarios for natural gas, which correspond to those for crude oil (Table 5-5). It was first assumed that the gap between natural gas and crude oil prices would be substantially smaller by 1980. In terms of BTU equivalence, six thousand cubic feet of natural gas equal one barrel of crude oil. Thus, in the first scenario with low crude oil prices, natural gas is \$1.00/mcf in 1980 or equivalent to crude oil, which is \$6.00/barrel. In the second scenario, the natural gas price rises to \$1.15/mcf in 1980, while the crude oil price by that time is \$7.00/barrel. Similarly, in the third scenario the price of natural gas rises to \$1.40/mcf by 1980, while crude oil is \$8.50/barrel.

The essential difference between the three cases for natural gas is that it is assumed in the first case that the Mackenzie Valley gas pipeline will not be built before 1985. In the other two cases, the pipeline is constructed and some additional exports are licensed from this source in the 1980s. Otherwise, exports are assumed to remain at the level approved in 1973 (i.e., no new licences will be granted over the 1973-85 period). The average annual growth in consumption of natural gas is assumed to be 7 per cent, 6 per cent, and 5 per cent for the low-, medium-, and high-price scenarios, respectively. These growth differentials are not meant to reflect the elasticity of demand accurately; rather, they acknowledge at least some small response to changes in price. In both higher-price cases, the Mackenzie Valley gas pipeline is assumed to be operating at capacity by 1981, with half of its 4 bcf/day throughput being Delta gas. Production from non-frontier reserves is then determined from the consumption, export, and frontier production assumptions, assuming as well that imports remain at 16 bcf per year through to 1985.

## INVESTMENT REQUIREMENTS IN THE 1970s AND 1980s

Each scenario of every resource development implies a specific pattern of investment for the projects envisaged in the scenario. For instance, the second case for crude oil production required four synthetic crude oil plants by 1985, while the third case required eight such plants, or at least twice the capital expenditure of the second case. We will examine first the capital requirements implicit in the three scenarios for crude oil, then the capital requirements for natural gas development – notably the Mackenzie Valley gas pipeline – and last, other major energy projects. What are the time paths for these projects, and how do they coincide with one another? What particular demands will be made for inputs to these projects?

**Table 5-5**  
**Volumes and Prices for Natural Gas Scenarios, 1973-85**  
**Scenario A (Low Price)**

	Consumption (1)	Exports (2)	Nonfrontier Production Requirements (1) + (2) (3)	Imports (4)	Nonfrontier Production Requirements <sup>1</sup> (3) - (4) (5)	Price per mcf (6)
			(Billion cubic feet)			
1973 <sup>2</sup>	1,500	1,022	2,522	16	2,506	0.40
1974	1,605	1,022	2,627	16	2,611	0.50
1975	1,717	1,059	2,776	16	2,760	0.80
1976	1,837	1,095	2,932	16	2,916	0.80
1977	1,966	1,095	3,061	16	3,045	0.85
1978	2,104	1,095	3,199	16	3,183	0.90
1979	2,251	1,095	3,346	16	3,330	0.95
1980	2,409	1,095	3,504	16	3,488	1.00
1981	2,578	1,095	3,673	16	3,657	1.03
1982	2,758	986	3,744	16	3,728	1.08
1983	2,951	949	3,900	16	3,884	1.13
1984	3,158	949	4,107	16	4,091	1.19
1985	3,379	913	4,292	16	4,276	1.25

<sup>1</sup> This is the production required to meet the forecast consumption and exports, less imports. The exports are assumed to be held at the 1973 licensed level. Actual production might be greater than required production, particularly as the price increases in scenarios B and C. As well, there may be new export licences, which would increase Canadian export commitments. The only new exports assumed in this analysis are those from the Mackenzie Valley, in scenarios B and C.

<sup>2</sup> Data for 1973 were preliminary at the time the scenarios were prepared. Thus they differ from the most recent data shown on page 118.

Table 5-5 (cont'd.)

## Scenario B (Medium Price)

	Consumption	Presently Licensed Exports	Mackenzie Valley Gas Production	Mackenzie Valley Gas Exports	Mackenzie Valley Gas for Canadian Consumption (3) - (4)	Nonfrontier Requirements (1) + (2) - (5)	Imports	Nonfrontier Production Requirements <sup>3</sup> (6) - (7)	Price per mcf
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1973 <sup>2</sup>	1,500	1,022				2,522	16	2,506	0.40
1974	1,605	1,022				2,627	16	2,611	0.50
1975	1,701	1,059				2,760	16	2,744	0.88
1976	1,803	1,095				2,898	16	2,882	0.95
1977	1,911	1,095				3,006	16	2,990	1.00
1978	2,026	1,095				3,121	16	3,105	1.05
1979	2,148	1,095	150		150	3,093	16	3,077	1.10
1980	2,277	1,095	350		350	3,022	16	3,006	1.15
1981	2,414	1,095	730	200	530	2,979	16	2,963	1.21
1982	2,559	986	730	200	530	3,015	16	2,999	1.27
1983	2,713	949	730	200	530	3,132	16	3,116	1.33
1984	2,876	949	730	150	580	3,245	16	3,229	1.40
1985	3,049	913	730	150	580	3,382	16	3,366	1.47

Table 5-5 (concl'd.)

## Scenario C (High Price)

	Consumption	Presently Licensed Exports	Mackenzie Valley Gas Production	Mackenzie Valley Gas Exports	Mackenzie Valley Gas Consumption	Nonfrontier Requirements (1) + (2) - (5)	Imports	Nonfrontier Production Requirements <sup>3</sup> (6) - (7)	Price per mcf (9)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
1973 <sup>2</sup>	1,500	1,022				2,522	16	2,506	0.40
1974	1,605	1,022				2,627	16	2,611	0.50
1975	1,685	1,059				2,744	16	2,728	0.90
1976	1,769	1,095				2,864	16	2,848	1.00
1977	1,857	1,095				2,952	16	2,936	1.10
1978	1,950	1,095				3,045	16	3,029	1.20
1979	2,047	1,095	150		150	2,992	16	2,976	1.30
1980	2,149	1,095	350		350	2,894	16	2,878	1.40
1981	2,256	1,095	730	200	530	2,821	16	2,805	1.47
1982	2,369	986	730	200	530	2,825	16	2,809	1.54
1983	2,487	949	730	200	530	2,906	16	2,890	1.62
1984	2,611	949	730	150	580	2,980	16	2,964	1.70
1985	2,742	913	730	150	580	3,075	16	3,059	1.78

<sup>3</sup> These refer to production required to meet forecast consumption and exports less imports and frontier gas available for domestic consumption. Actual production may be higher in response to the higher natural gas prices and the exports indicated in column (2) may be increased from 1973 levels. We assume that new exports of Mackenzie Valley gas will be licensed, beginning in 1981.

### Alberta Tar Sands

Before discussing the capital requirements of two to eight synthetic crude plants, it may be useful to outline the peculiarities of synthetic crude oil as opposed to conventional crude. Synthetic crude is the end product of highly processed crude bitumen. The crude bitumen, once it has been recovered by either of two techniques – open-pit mining or the “in situ” process – is upgraded to form synthetic crude oil, which can then be refined into gasoline, aviation fuels, or other refined petroleum products. One distinct advantage of synthetic crude oil is that the sulphur has been removed.<sup>11</sup>

Current estimates place Alberta's reserves of in-place crude bitumen at 900 billion barrels. However, of this total, only 38 billion barrels are thought to be recoverable by present techniques, from which 26.5 billion barrels of synthetic crude may be produced. Although the 900 billion barrels are located in four main deposits in Alberta – Athabasca, Cold Lake, Wabasca, and Peace River – only the Athabasca deposit is thought to be recoverable. It covers some 5½ million acres, with an overburden of zero to 2,000 feet. Only a half million acres, with an overburden of 150 feet or less, are suitable for surface mining. It is in this half-million-acre area, which has an estimated 74 billion barrels of in-place crude bitumen reserves, that the 38 billion barrels of proved recoverable crude bitumen lie. The remaining Athabasca region, with an overburden of 150 to 2,000 feet, holds an estimated 552 billion barrels of in-place crude bitumen. The basic difference between open-pit mining and the “in situ” recovery methods is that the open-pit-mining technique is used where there is no more than 150 to 200 feet of overburden, while the “in situ” method is used when, without prior removal of the overburden, the crude bitumen must be removed from very deep reservoirs. Great Canadian Oil Sands Limited, the only synthetic crude plant currently in operation, uses open-pit mining; Syncrude plans to use basically the same technique.

The Alberta Energy Resources Conservation Board estimated, for the January 1974 Federal-Provincial First Ministers' Conference on Energy<sup>12</sup> that the proven recoverable reserves are sufficient to support twenty to thirty plants of 100,000 to 150,000 barrels/day capacity. The estimated lead time – that is, from plant conception to the start of production – is five to six years. The Alberta Board places the cost of a 100,000 barrels/day plant at between \$800 and \$1,000 million (in 1974 dollars). Syncrude Canada Limited and both Shell Canada Limited and Shell Explorer Limited have plans to build.

11 Sulphur and petroleum coke are by-products that may have significant value in the long run.

12 Province of Alberta, “The Alberta Oil Sands Story,” Document No. FP-4098, January 1974.



Syncrude Canada Limited – a consortium of Imperial Oil Limited, Canada-Cities Service Limited, Atlantic Richfield Canada Limited, and Gulf Oil Canada Limited – is expected to begin operating in 1977, with a production rate of 50,000 barrels/day by 1978, 90,000 in 1979, 105,000 in both 1980 and 1981, 115,000 by 1982, and 125,000 by 1984. Syncrude and the Province of Alberta have signed an agreement whereby the province will be a joint-venture participant in the project. It will receive from Syn-crude 50 per cent of pre-tax profits<sup>13</sup> in return for the province's interest in the leases and leased substances. This profit-sharing arrangement will be in lieu of the traditional production royalty payments to the province. The agreement also provides for an equity option in the operation of up to 20 per cent for the provincially owned Alberta Energy Company. Syn-crude plant costs were estimated in February 1974 to run close to \$1.4 billion, including utility and pipeline facilities. Rising labour costs, and difficulties in getting firm price commitments and delivery schedules for machinery and equipment, resulting in delays, are expected to increase this cost estimate.

Shell Canada Limited and Shell Explorer Limited have submitted an application to the Alberta Energy Resources Conservation Board for a synthetic crude plant that would commence operations in 1980 and reach its 100,000 barrels/day capacity by 1982. Construction would commence in 1976, and costs have been tentatively estimated at \$700 million (minimum).

Besides these two ventures, a consortium headed by Petrofina Canada Ltd. may soon file application for a plant of 100,000 barrels/day capacity or more, and Great Canadian Oil Sands Limited is planning to increase its capacity to 65,000 barrels/day.

During the 1980s several more synthetic crude plants may be built. One of the crucial questions is whether the economy will be able to supply the capital and labour requirements for such ventures without excessive strain on its resources. If one new plant is started every year from 1977 to 1985, the construction phases of these plants would overlap considerably, placing heavy demands on the economy for capital requirements as well as labour. Each 100,000 barrels/day plant would require approximately five thousand man-years of construction labour and eight hundred man-years of design and professional services.<sup>14</sup> How such tar-sands projects might be financed, and what amount of capital inflow might be expected, is not yet clear.

13 These are the pre-tax profits remaining each year after deduction from total revenue of operating costs, depreciation or recovery of capital, and an allowance for capital employed (or the equivalent of 6 per cent of total capital employed).

14 *Ibid.*, p. 39.

### Mackenzie Valley Gas Pipeline

Canadian Arctic Gas Study Limited, a consortium of twenty-seven firms (including sixteen major American natural gas producers and distributors), submitted a proposal in March 1974 for the construction of a 48-inch pipeline to carry natural gas from the Mackenzie Delta to markets in Canada and the United States. The capacity of the pipeline would be 4.5 billion cubic feet per day, of which about 0.4 billion cubic feet would be used to power the system. Originally the Arctic Gas group planned that half the pipeline capacity would be filled with Delta gas and half would come from Prudhoe Bay in Alaska. The Prudhoe Bay gas would be trans-shipped to U.S. markets, while half the Delta gas would be consumed in Canada and half would be exported to the United States. It appears at the moment, however, that less gas may be exported than initially proposed. The potential gas reserves in the Mackenzie Delta have been estimated at 55 tcf, but by late 1973 only 7 tcf had been proved.

The estimated capital requirements for the pipeline are \$5 billion (minimum). Arctic Gas intends \$4.4 billion to be represented by facilities in Canada, which would include an expenditure of \$3.5 billion during the first three years of construction and the remainder during the next two years, by which time full deliverable capacity would be achieved.<sup>15</sup> The financing proposals of Arctic Gas are for an 80-20 split between debt and equity. The \$4-billion debt capital would include 20- or 25-year first mortgage bonds, some junior debt money, and bank loans. Of the \$1-billion equity, it is hoped that at least 50 per cent would be secured in Canada.

One of the questions about this pipeline is whether Canadians need the Delta gas immediately or whether they could afford to wait several years before transporting it to southern markets. Many of the results of the analyses of this question rest on assumptions about existing proven reserves, the price of natural gas through the 1970s and 1980s, and the availability of nonfrontier reserves at forecast gas prices. Recent information suggests, however, that if the Arctic Gas plans are approved by the government agencies and departments concerned, construction would commence in the winter of 1976-77, with the first Delta gas being shipped by the Fall of 1978.

The Mackenzie Valley gas pipeline is not, however, the only way to bring gas from the Mackenzie Delta to Canadian markets. One alternative scheme that has been put forward involves a smaller pipeline that would not require transmission of Alaskan gas. It would transport gas almost entirely to Canadian consumers, with only a small portion initially being

15 Presentation by V. L. Horte, Canadian Arctic Gas Study Limited, to Toronto Society of Financial Analysts, April 18, 1973.

sold to the United States. More details on other schemes may become public, as National Energy Board hearings on gas supplies proceed. These hearings began in September 1974.

### **James Bay Development**

This project is already under way, with the first power production expected by the end of 1979. The development will include four major dams, built on La Grande Rivière. The largest of these, known as LG-2, is of comparable size to the Churchill Falls development and will have a generating capacity of 10.3 million kilowatts. The total installed power from James Bay will amount to about 16 million kilowatts, which should be available for use by 1984. If a second phase is pursued – whereby an additional 7 to 8 million kilowatts would be developed – the additional power could be sold to neighbouring provinces or to the United States, while the power from the initial phase will be used exclusively in Quebec. The total cost of the James Bay development has been revised upwards from the 1972 estimate of \$5.8 billion to \$11.9 billion for the period 1972-85.

### **Investment Time Paths Implicit in the Three Scenarios**

Having discussed the investment requirements of individual projects, how do these mesh together, and what are the requirements implicit in each of the scenarios above? These investment requirements are for other than normal expansion or extension of pipelines, crude oil production facilities, etc. For instance, the tar-sands plants and the Mackenzie Valley gas pipeline are not considered to be part of normal energy investment.<sup>16</sup> The first scenario requires only two synthetic crude oil plants by 1985, while the second requires four plants of 100,000 barrels/day capacity. Investment requirements of the first scenario are quite small and are shown in Table 5-6. As all four synthetic crude plants in the second scenario must be operating at capacity by 1985, the construction period must be concentrated between 1975 and 1980 so as to allow a lag from the time construction is completed until full capacity is reached. The total cost of these plants would be about \$4 billion (1973 dollars). The Sarnia-Montreal pipeline (which is included in all three scenarios) is expected to cost approximately \$150 million and is assumed to begin operating in 1976. The Mackenzie Valley gas pipeline will require financing of at least \$5 billion over a minimum five-year period commencing in 1977. The

16 For our definition of "additional investment," see Table 5-6.

general pattern of investment requirements for these developments is shown in terms of both 1961 and 1973 dollars in Table 5-6.

The third scenario requires \$4 billion more than the second scenario to finance the more rapid development of the tar sands. The Montreal pipeline and the Mackenzie Valley gas pipeline are again included in the scenario. However, in this option, eight synthetic crude plants of 100,000 barrels/day capacity must be in operation by 1985. Again, because of the lag between the completion of construction and the attainment of full capacity, the construction phase for these plants would be bunched between 1975 and 1981, placing very heavy strains on the economy for specialized materials and labour skills. The total requirements for this case are also shown in Table 5-6.

Whether the Canadian economy can cope with such magnitudes of investment (as implied in either scenario B or C) will depend on the state of the economy in that particular time period. With appropriate fiscal and/or monetary policies the government may be able to offset successfully some of the undesired effects of such large-scale investment. However, if there is already undue strain on resources in particular sectors of the economy, the additional investment required for the above projects could provoke a certain degree of instability in the economy. Projections of the Canadian economy under alternative energy scenarios are discussed in Appendix B.

**Table 5-6**  
**Additional<sup>1</sup> Private Investment Requirements of the Three Scenarios, 1974-85**

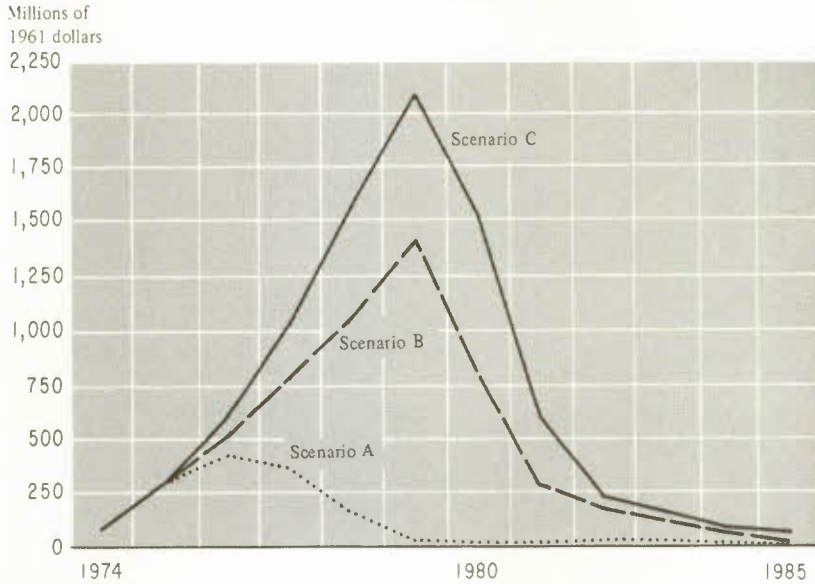
	A		B		C	
	\$ 1961	\$ 1973	\$ 1961	\$ 1973	\$ 1961	\$ 1973
	(Millions)					
1974	82	120	82	120	82	120
1975	275	425	275	425	275	425
1976	426	645	508	765	590	885
1977	377	550	817	1,214	1,056	1,564
1978	165	240	1,048	1,585	1,611	2,405
1979	24	35	1,401	2,155	2,094	3,165
1980	7	10	872	1,349	1,502	2,269
1981	10	15	284	443	596	898
1982	20	30	167	276	226	346
1983	27	40	137	212	155	237
1984	17	25	67	102	95	142
1985	7	10	34	50	76	110
Total	1,437	2,145	5,692	8,696	8,358	12,566

<sup>1</sup> By "additional" investment is meant investment over and above "normal" investment estimated by the CANDIDE model. The James Bay development is assumed, in this sense, to be included in "normal" investment.



Chart 5-3

**Additional Private Investment Requirements of the  
Three Price Scenarios, 1974-85**



SOURCE Based on estimates by the Economic Council of Canada.

### OVERALL SUPPLY AND DEMAND IN THE LONG RUN

While Canada does not lack energy supplies to satisfy her requirements to 1985, the outlook for longer-run supplies is less clear. As conventional energy sources, notably crude oil and natural gas, are depleted, there will be increasing reliance on coal, hydro, and nuclear energy. As noted at the beginning of this chapter, petroleum and natural gas are estimated together to account for 63 per cent of primary energy consumption in the year 2000.<sup>17</sup> But this same projection indicates that nuclear power will provide 18 per cent of consumption needs by that date, compared with a negligible amount in 1970. Canada now has a surplus of low- and medium-cost uranium that would more than adequately satisfy the requirements for nuclear power generation. Hydro-electricity will play an important role, as well, over the long run. By the year 2000, it has been estimated that hydro-electricity will provide some 12 per cent of primary energy needs and 19 per cent of secondary needs.<sup>18</sup> There are still areas in Canada that have undeveloped hydraulic resources that would be competitive with low-cost nuclear power. Of course, all the forecasts of relative shares of

<sup>17</sup> EMR, *An Energy Policy for Canada*, pp. 71-72.

<sup>18</sup> *Ibid.*



energy types are contingent on specific assumptions about the rate of price increase and relative prices.

### **The Roles of Uranium, Hydro-electricity, and Coal**

Nuclear power (based on uranium), hydro-electricity, and coal do not now satisfy the major energy requirements in Canada. Their role in energy supply, while significant, remains relatively small. However, it is estimated that, by the year 2000, 37 per cent of Canadian primary energy requirements will be satisfied by coal, hydro-electricity, and nuclear power, with a similar pattern for secondary energy requirements.<sup>19</sup> As well, it is possible that the role of coal may take on renewed importance, resulting from the recent rapid price increases of crude oil and the accompanying uncertainties of foreign supply.

Canadian uranium ( $U_3O_8$ ) requirements have been estimated at 100,000 tons to the year 2000, with export commitments of 60,000 tons, totaling 160,000 tons.<sup>20</sup> Canada is clearly well endowed with uranium resources. At prices of up to \$15.00 per pound, there are approximately 400,000 tons of  $U_3O_8$  known available, and an additional 500,000 tons of potential reserves. Uranium costs play a very small role in nuclear-generated electricity. Heavy water reactors similar to the CANDU reactor can provide Canadians with more than adequate electricity, at "reasonable" costs, for at least another century.

Canada's potential for hydro-electricity has diminished as the few remaining hydraulic sites have been developed. A few sources in British Columbia, the Nelson River in Manitoba, and the second phase of the James Bay project in Quebec could still offer hydro-electricity at costs competitive with nuclear power, but after 1990 there will likely be relatively few additions to hydro capacity, as low-cost nuclear energy becomes competitive with hydro-electricity.

Canadian known coal reserves have been estimated at 120 billion tons, which is more than enough to satisfy domestic demand in the future. However, because of environmental constraints and the relatively high costs of mining coal, this secure supply of energy will possibly not be exploited nearly as rapidly as other Canadian energy sources.

### **Substitution**

As specific energy sources are depleted – for instance, when Canada's supply of conventional crude runs out – all users of this source will be forced

<sup>19</sup> *Ibid.* These projections were made before the recent price hikes in crude oil.

<sup>20</sup> *Ibid.*, p. 81.

to substitute another form of energy in its place. But until, say, 1985 will there be wide-scale substitution of one type of energy for another as prices change or as security of supply is increasingly threatened?

The price of oil and natural gas to consumers in both Canada and the United States had remained very stable for a relatively long period of time before 1973. Consequently there is no reliable empirical evidence to suggest the rate at which people will respond to price changes either by conserving energy or substituting competing forms of energy. There will always be a certain time lag in making the switch from one energy source to another, and there will be costs associated with it. Where the potential exists for switching from, say, petroleum to natural gas, there must first be some incentive for the change to take place. The most obvious incentive is, of course, price. If the price of petroleum rose high enough in relation to natural gas, one might expect an increasing amount of substitution. But this assumes that petroleum will continue to be priced above gas and that the costs of switching from petroleum to natural gas will be outweighed by the benefits of using gas. As relative prices shift, one can expect some degree of substitution. It should also be noted that certain forms of energy, say electricity, may use other energy inputs – in this case, petroleum or nuclear power. As well, electricity production has very evident capacity constraints, which may make a high degree of substitution of electricity for other energy sources impractical or impossible in the short to medium term.

### **Economic Rent and Resource Development**

The very large increases that have taken place recently in the world price of oil have given rise to what businessmen sometimes refer to as “windfall gains.” In more technical discussions, such gains are more usually referred to as “economic rent,” defined for our present purposes as the difference between the gross selling price of a resource and total production costs, including a “fair rate of return” to investment and risk-taking. The amount of rent available will be determined by, among other things, international prices, the rate of production, and production costs. Rent may accrue, implicitly or explicitly, to any of three groups: government, industry, and consumers.

The amount of rent actually collected by governments, however, will depend partly on the “passive” impact of the tax and royalty structure in effect and partly on active government decisions about whether to appropriate a part of all such rent. Federal and provincial governments may collect rent on resources in several forms. The most obvious of these is royalties, but other methods include corporate taxation, land registrations, and export taxes. The amount of rent collected, at a given resource selling price, will likely affect industry motivation; that is, increased rent will

tend to discourage industry exploration and the development of new energy sources. To the extent that the rent collected by governments is used to promote further exploration, disincentives to industry may be partially or wholly offset. However, if these funds are not used this way, while some other sectors of the economy may benefit in the short run, the resultant reduction in the volume of proved energy reserves will affect the entire economy in the longer run. Any short-term advantage to present consumption will be realized at the expense of future consumption in the form of higher prices. The amount of rent collected by governments must not be such as to discourage adequate development of higher-cost energy sources, which will gradually replace conventional reserves, unless governments are prepared either to accept exceptionally steep price increases at a later date or to rely upon imported supplies.

Industry may receive rent from existing resources in the form of corporate profits. It may be argued that higher returns on investment are required to cover the higher risk and costs involved in developing new energy reserves. For example, the higher costs of drilling for oil and gas in the Arctic, in terms of higher costs per well and greater uncertainty, would necessitate a larger return per barrel for the companies involved. For public policy, the major problem appears to be that of ensuring that rents from the ownership of existing scarce resources are directed towards future development, rather than taking the form of dividend payments to individuals or transfers to nonresident companies. It must be recognized that continuous changes in fiscal terms, however, may make longer-range planning difficult at a time when sound planning is particularly important.

The consumer may initially benefit implicitly if domestic energy prices are held below international levels. This is the case for Canada, at the moment, where the consumer benefits by paying lower prices for energy than he would if domestic and international prices were equated. Presently in Canada's unique situation of being both an importer and an exporter of crude petroleum, all Canadian consumers are being "subsidized" by lower prices associated with the export tax on crude oil. While, in the short run, the consumer benefits from this situation, one must look at the longer-range implications. For example, there may not be adequate energy reserves to satisfy domestic needs in the longer run. This would result from two consequences of a relatively low price. The first is that it would not only provide a reduced incentive to the conservation of energy but, in addition, it would foster the expansion of energy-intensive industries, resulting in a higher domestic rate of consumption of energy than if the Canadian price were allowed to reach the international level.<sup>21</sup> The

21 If exports of energy-intensive products are stimulated by lower domestic energy prices, the "economic rent" may be largely passed on to the foreign purchasers of such exports.

second is that it would discourage development of higher-cost energy reserves. The results would be fewer additions to proved reserves, as well as increased consumption, leading to the depletion of proved reserves at a faster rate. To the extent that the government can ensure continued provision of "adequate" reserves under a two-price system, even though consumption remains at higher levels because of a relatively low price, such a pricing policy may be justified for a time. However, in the long run, no country's reserves, particularly low-cost conventional reserves, are infinite, and it is in this light that the short-run benefits to consumers from such a pricing policy must be examined.

Clearly the allocation of rents from existing resources is a complex one that must be considered with a view to both short- and long-run consequences. It cannot be settled by any one body, but it must take into account the interests of federal and provincial governments, industry, and consumers, both in the short run and over the longer term.

### CONCLUDING COMMENTS

It is probable that Canada will become a net importer of oil before 1980, unless Canadians are fortunate enough to discover new reserves that can be exploited quickly or unless early measures are taken to develop other domestic sources of energy to replace declining oil production. The present trend towards increasing Canada's self-reliance on oil supplies (that is, supplying a greater proportion of Canadian consumption from domestic production) implies a need for the *early* planning of supply sources and transport over the long run. Planning for the long term must include development of high-cost sources of oil and gas, as well as coal, nuclear power, and hydro. The analysis in this chapter suggests that energy strategy should give great weight to the need to encourage exploration for oil and gas and to the need to restrain the growth of Canadian energy consumption as much as is consistent with the basic requirements of a growing economy. The key consideration is that different patterns of price increase imply different requirements for investment, and they have differing impacts on the structure of the total economy, on trade and the balance of payments, and on the required amount of savings (whether domestic or foreign) to sustain investment.

It is quite possible, however, that the present high level of international oil prices – which makes the development of the tar sands and frontier oil in Canada a good commercial proposition – could recede to more moderate levels within the next few years. If foreign oil were again to become substantially cheaper than Canadian oil, there would be market



pressures to increase the proportion of Canadian consumption supplied by imported oil. The issue of security of supply would then remain a major uncertainty. Canadians should be disposed to develop indigenous energy supplies and distribution facilities adequate to meet basic needs in case of future interruption in imported supplies.



# 6

## *The World Economic Climate and Canadian Trade*

Canadian economic performance is strongly influenced by the course of external events. In particular, foreign growth profoundly affects the level of economic activity in Canada; foreign inflation affects the rate of price increase registered by a great variety of exported and imported products. This chapter presents an assessment of Canadian trade and trade prospects in the context of foreign growth and price developments. The assumptions concerning foreign prices are central both to the establishment of our performance objectives for the 1973-77 period and to the projections we have made of longer-term future developments. It is perhaps worth emphasizing that not only do the policies, decisions, and performance of foreign countries influence the obvious "external" indicators, such as the growth of exports and international commodity prices, but they have an impact on the whole range of our "domestic" indicators. This chapter also discusses some topics not directly related to the performance indicators, such as international trade and monetary negotiations, which will critically affect Canada's economic welfare in the medium- to long-term future.

### THE EXTERNAL ENVIRONMENT

The outstanding features of the world economy in 1973 were the coincident rapid growth of real output in all leading industrial countries, together with a similarly rapid and pervasive inflation of commodity prices. The pace of growth in the United States and in other high-consumption countries created demands that pressed hard on the capacity of many industries to deliver their products. The supply bottlenecks that emerged were partly a reflection of inadequate levels of investment in productive facilities in earlier years. Both the U.S. and Canadian economies, for example, had previously operated for some time below the level of potential output. The stimulus of buoyant demand to investment had thus been lacking. The shortfalls in the creation of capacity that resulted simply could not be overcome in one year.

There is, of course, no such thing as rapid inflation for which no one, or no policy, is responsible. "International" inflation at disturbing rates is the result of the policies of many national governments over a long period of time. There are short-term qualifications to this statement, such as the effect of weather patterns on crops. In the long run, however, "international" inflation is the result of inadequate national policies and inadequate international co-operation – or even conflicts – in the pursuit of stabilization and planning objectives. Examples include the preservation of a rigid international monetary system before 1971, with a consequent increase in the U.S. dollar reserves, and excess world liquidity. A further example is the use of short-term income and price controls, which has often increased uncertainty and induced counterproductive behaviour from labour and suppliers of goods. Although inflation has been particularly pronounced in 1973 and 1974, there had been a gradual intensification of inflation in earlier years, and the roots of today's experience go back a long way into the past.

One disturbing aspect of national policies has been the rapid rates of growth of the money supply (see Table 6-1 and Chart C-1).<sup>1</sup> Monetary authorities in several countries have, for many years, periodically been pressured to expand the money supply rapidly to accommodate short-term employment policies and/or to maintain fixed exchange rates. The growth of liquidity in many important countries has thus, for years, far exceeded the growth of real output.

There were also two more specific factors that contributed to world shortages and inflation last year: first, poor farm and fishery harvests in 1972; second, the shortfall of crude oil supply that resulted from joint action by the Arab countries.<sup>2</sup> World harvests of food, feed, and fish in 1973 were not large enough to overcome the deficiencies of 1972, and stocks of key commodities such as grain fell to dangerously low levels in relation to world population. The low supply and high price of crude oil during the winter of 1973-74 compounded the problems of attempting to increase farm production in 1974, since oil products are ingredients in many fertilizers and modern agriculture is mechanized.

The data for ten important commodities (Table 6-2) provide perspective on what happened to international trade prices in 1973. All of these prices continued to rise in the early months of 1974, although some of them have since fluctuated – downwards as well as upwards.

1 Appendix C contains additional statistical information on Canada's trade and related questions.

2 The Arabs also temporarily embargoed exports of oil to the United States. It was, however, the cutback in production by Saudi Arabia and other large Arab producers that precipitated the rapid rise in oil prices in the winter of 1973-74.

**Table 6-1**  
**Growth in Output, Prices, and the Supply of**  
**Money in Selected Countries, 1967-73**

	Money <sup>1</sup>	Real Gross National Product	Gross National Product Prices
	(Average annual percentage change)		
Japan	19.3	10.9	5.4
United States	9.4	3.8	4.6
Britain	14.3	2.8	7.3
France	14.2	6.0	5.7
Germany	13.6	5.4	5.3

<sup>1</sup> Money plus quasi-money, as defined by the International Monetary Fund: currency, demand deposits, and short-term obligations of banks and governments.

SOURCE Based on data from the International Monetary Fund; the Japan Economic Research Center; the U.S. Department of Commerce; and the National Institute of Economic and Social Research.

**Table 6-2**  
**Price Indexes of Some Major World Trade Commodities, 1968-73**  
 (U.S. dollars)

	1968	1969	1970	1971	1972	1973
	(1971 = 100)					
Beef (New York)	84.8	91.6	97.2	100.0	117.1	149.8
Coffee (New York)	83.0	89.3	119.4	100.0	112.3	147.3
Sugar (Caribbean)	43.8	74.8	83.2	100.0	166.4	213.5
Corn (United States)	81.4	88.6	97.9	100.0	93.6	147.1
Wheat (Thunder Bay)	103.4	100.0	97.1	100.0	110.3	228.6
Aluminum (Montreal)	88.4	94.0	98.2	100.0	94.4	95.8
Copper (Montreal)	84.9	91.6	106.1	100.0	98.2	121.8
Newsprint (New York)	90.1	93.1	95.9	100.0	103.9	108.5
Pulp (United States)	89.7	89.7	98.2	100.0	98.8	114.5
Petroleum (Persian Gulf)	83.3	83.3	83.3	100.0	110.7	154.7

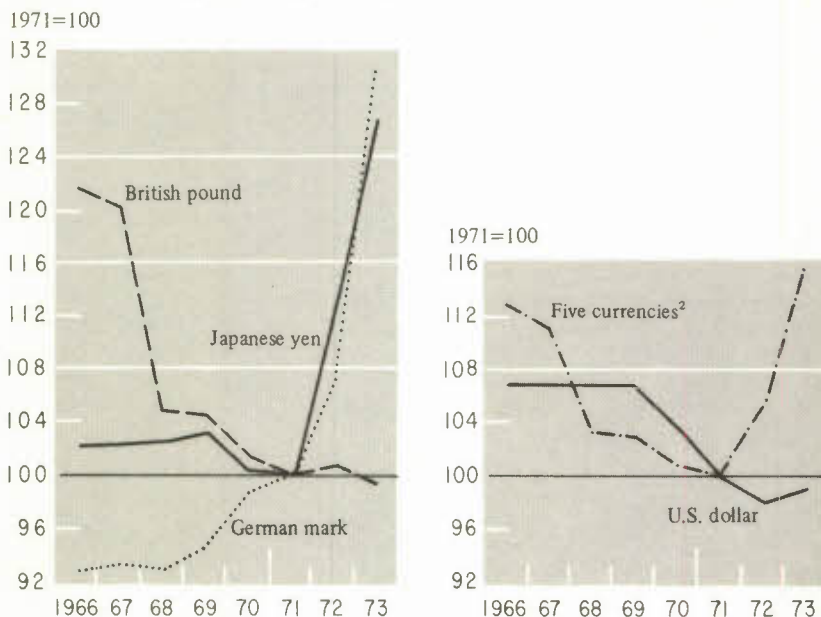
NOTE The annual averages conceal sharp movements within a year. For example, the Persian Gulf petroleum price was about \$u.s.2.60 per barrel at the beginning of 1973 and about \$u.s.5.90 per barrel by the end of the year. On the other hand, annual averages are helpful in placing volatile price movements in a better long-term perspective than is afforded by monthly data.

SOURCE Based on annual average wholesale price data from the International Monetary Fund, *International Financial Statistics*, July 1974.

The commodity market forces that tended to generate inflation last year were reinforced by the state of the international currency markets,

including the sharp devaluation of North American currencies in relation to the mark and the yen. The old international monetary system collapsed in 1971, when the United States floated its dollar. The protracted negotiations to reform the system were already difficult enough in 1973, when they were overtaken by the oil crisis and the escalation of liquid funds held by oil-exporting countries. The increased price of oil created balance-of-payments problems for most industrial countries (Canada is an exception) and for all the developing countries that do not produce enough oil. There had already been some decline of confidence in the stability of currencies and a tendency to buy real assets, including some commodities. As a result of all these circumstances, the industrial countries had little option but to continue the practice of floating their currencies. They are relying now on a policy of flexible exchange rates and on established habits of consultation, co-operation, and mutual surveillance to avoid competitive devaluations akin to those of the 1930s. This approach has so far worked remarkably well, under highly demanding circumstances, and world trade has continued to grow without insurmountable tensions.

Chart 6-1

Indexes of Foreign Exchange Rates, in Terms of the Canadian Dollar, 1966-73<sup>1</sup>

<sup>1</sup> Annual average spot rates.

<sup>2</sup> The average is computed with current Canadian trade weights. The five currencies are the British pound sterling, the Japanese yen, the German mark, the French franc, and the Italian lira. The Canadian dollar is set at 100. See Table C-7 for details.

SOURCE Based on data from the Bank of Canada; Statistics Canada, *Trade of Canada*; and estimates by the Economic Council of Canada.



Some perspective on recent changes in exchange rates is provided by Chart 6-1 (see also Table C-7). From 1966 to 1973 the German mark appreciated by about 40 per cent in relation to the Canadian dollar and by about 70 per cent in relation to the pound sterling. The yen appreciated by close to 25 per cent in relation to the Canadian dollar over the same period. The strength of the yen and the mark has not entirely cushioned their respective economies against external inflation, but it has helped. The devaluation of the pound sterling has contributed to British inflation.

The most important exchange-rate influence on Canadian trade and prices has been the depreciation of the U.S. dollar (appreciation of the Canadian dollar in U.S. currency) since 1970. Up to 1971, other major foreign currencies also depreciated in relation to the Canadian dollar, on balance. Since 1971, however, the appreciation of foreign currencies has tended to offset the depreciation of the U.S. dollar in relation to the Canadian dollar.

#### CANADIAN TRADE DEVELOPMENTS TO 1973

Canadian trade prices reflected world inflation in 1973. Preliminary National Accounts figures indicate that Canadian export prices rose by 14.4 per cent and import prices by 8.9 per cent, significantly above apparent domestic rates of inflation. These early figures are undoubtedly subject to revision. There is no doubt, however, that rates of price increase were high (Table 6-3) and that export prices rose much more rapidly than import prices.

Table 6-3  
Change in Canadian Trade Prices of Goods and Services, 1968-73

	1969	1970	1971	1972	1973	Annual Average 1968-73
	(Per cent)					
Exports	2.2	3.5	0.3	3.1	14.4	4.6
Imports	2.8	2.7	1.8	2.7	8.9	3.8

SOURCE Based on data from Statistics Canada, *National Income and Expenditure Accounts*.

The most rapid price increases were for primary and processed products (Table 6-4); trade prices for highly manufactured goods, including auto products, were much more stable. The greater importance of such manufactures in imports than in exports largely accounts for the lower rate of



increase in import prices.<sup>3</sup> Both export and import prices have considerable influence on "domestic" prices.

**Table 6-4**  
**Increase in Canadian Trade Prices, by Product Group, 1973**

	Exports	Imports
	(Per cent)	
Live animals	25.7	52.2
Food, feed, beverages, and tobacco	35.7	24.3
Crude materials	18.7	21.1
Fabricated materials	17.8	15.2
Highly manufactured goods	3.3	5.7
All goods	15.3	10.6

SOURCE Based on data from Statistics Canada, *Trade of Canada*. Merchandise trade prices are not published at this level of detail in the National Accounts.

The National Accounts data for 1973 suggest that the estimate of the growth of imports that appeared in the Council's *Tenth Annual Review* was too low and that of exports was too high (Table 6-5). The growth of exports was significantly lower than anticipated in 1973 because supplies of some products were delayed, both for the domestic and export markets; grain deliveries lagged on account of transport problems; and strikes in the third quarter retarded export flows, though some of this shortfall was recouped towards the year-end. There were also bottlenecks in railroad and truck transport in both the United States and Canada.

**Table 6-5**  
**Increase in Trade Volume of Goods and Services, 1973**

Exports		Imports	
(Per cent)			
<i>Tenth Annual Review</i>	9.4	<i>Tenth Annual Review</i>	10.5
National Accounts	8.3	National Accounts	12.4

SOURCE Based on data from Statistics Canada, and the Economic Council of Canada *Tenth Annual Review* (1973). The underlying data are in 1961 constant dollars.

Despite the fact that the constant-dollar volume of imports rose much more rapidly than export volume, the deficit in current account of the

3 See Tables C-3 and C-4 for the relative importance of commodity groups in Canadian merchandise trade. In 1973, highly manufactured exports, including auto products, constituted 33.5 per cent of current merchandise exports; the comparable figure for imports was 63.5 per cent.

Canadian balance of payments declined in 1973 (Table 6-6). This outcome reflects the more rapid rise in export prices than in import prices and indicates that the change in the current account balance is attributable to world inflation rather than to the movement of exports and imports in real terms.<sup>4</sup>

In terms of 1961 dollars, exports of goods and services increased by \$1.61 billion last year; and imports, by \$2.47 billion. The difference between these two figures is equivalent to 1.1 per cent of Canadian real GNP. Thus inflation apparently resulted in a considerable net transfer of real resources to Canada in 1973, since the \$860-million increase in the volume deficit finally resulted in a \$230-million reduction in the current-dollar deficit, as shown in Table 6-6.

**Table 6-6**  
**Current Account of Canada's Balance of Payments, 1972 and 1973**

	1972	1973	Change
(Millions of current dollars)			
Statistics Canada data			
Merchandise balance	1,645	2,231	+586
Nonmerchandise balance	-2,300	-2,656	-356
Current account balance	-655	-425	+230
<i>Tenth Review estimates</i> <sup>1</sup>			
Merchandise balance	1,500	1,600	+100
Nonmerchandise balance	-2,080	-2,300	-220
Current account balance	-580	-700	-120

1 The 1972 figures shown were those reported at the time. They have since been revised as indicated by the latest Statistics Canada data.

SOURCE Based on data from Statistics Canada, and the Economic Council of Canada *Tenth Annual Review* (1973).

The fact that the Canadian trade balance gained from worldwide inflation in 1973 is not surprising, since Canada exports many of the goods that are in short supply and imports relatively few. It was the special, and to some degree temporary, circumstances of world supply in 1973 that gave rise to this improvement. As we have seen, export prices of highly manufactured goods did *not* rise faster than import prices of such goods

4 Canada has benefited from a 5.1 per cent improvement in the terms of trade in 1973. Among other industrial countries, only France has shown a more rapid increase in export prices than import prices. The United Kingdom, Italy, and Belgium experienced a deterioration in the terms of trade of 12.5, 10.0, and 4.5 per cent, respectively, in 1973. For further details, see the Bank of International Settlements, *44th Report*, June 1974.

(Table 6-4), and there is little reason to believe that the competitiveness of Canadian secondary manufacturing declined.

There has been some concern in Canada that the decline in the share of highly manufactured exports, as a percentage of total exports, may foreshadow a weakening of Canada's competitive position in this sector. But, when trade flows are measured in constant dollars, highly manufactured exports have not declined (Table C-3). Nevertheless, one can expect a less dynamic performance for this group of products in the immediate future. The strength of Canada's balance of payments has contributed to an appreciation of the Canadian dollar since the end of 1973, which tends to make the export of price-sensitive products more difficult in the short run. In addition, the transitional period for the automotive trade with the United States ended around 1969 and, while the trade continues to grow, the unusually rapid pace of 1965-69 is not being maintained.

In the longer run, the size of prospective investments in Canadian resource industries will tend to sustain or raise the exchange value of the Canadian dollar and to shift economic activity towards primary and processing production of resource products. In this situation, the way to maintain the viability of secondary manufacturing is to pursue policies to improve its productivity performance in the long run. It would be a serious error to attempt to "fix" the Canadian dollar exchange rate at a level below what market forces would produce. Such "fixing" might invite retaliation from trade partners, who have become increasingly conscious of the role of exchange rates in international economic adjustment. In addition, a devalued Canadian dollar would tend to increase inflationary pressures within Canada and to erase progressively short-term gains that might result from trying to maintain an artificially low exchange rate.

In this context, concern is sometimes expressed that capital inflows and appreciation of the Canadian dollar would have an adverse effect on employment, particularly in the manufacturing sector. The only circumstances in which large-scale capital inflows would seem clearly to be appropriate would be those in which the Canadian economy was already fully employed and domestic savings were inadequate to meet investment financing needs. Concern about employment in such circumstances is misplaced. On the other hand, if foreign investment inflows were to occur at a time when the economy was less than fully employed, it would be appropriate to question whether a less restrictive monetary policy might not be desirable so as to reduce, if possible, the capital inflows.

#### THE PROSPECTS FOR FOREIGN GROWTH AND EXTERNAL INFLATION

Canadian export growth depends substantially on the rate of growth of foreign markets, as well as on the availability of competitive supplies from

Canadian sources. The projected time paths of the growth of output in the United States, Japan, and Western Europe<sup>5</sup> have been combined, using Canadian export weights (Chart 6-2).<sup>6</sup> From 1972 to 1973, these massive industrial areas closed the gap between actual and potential output. The combined growth of the three areas in 1973 was about 6.5 per cent, compared with a potential rate of 4.4 per cent.<sup>7</sup> Over the 1973-77 period, the weighted average growth rate of output projected for the United States, Japan, and Western Europe is 3.6 per cent. The shortfall from the potential rate arises mainly from the effects of the oil crisis and other constraints in 1974-75. Growth is projected, over the 1973-77 period, at the rate of 3.1, 8.0, and 3.5 per cent per year, on average, for the United States, Japan, and Western Europe, respectively. From 1975 to 1977, the weighted average growth rate is 4.8 per cent per annum so that, on balance, between 1974 and 1980 the combined projected rate of growth for the three areas barely exceeds the potential rate. This implies a slow reduction in the gaps that developed in 1974 between actual and potential output.

Chart 6-2 illustrates the assumption that the major industrial areas will together be maintaining a significant gap between actual and potential output. The most notable feature is the sluggishness of the U.S. economy in 1974, with a rather moderate growth rate in 1975 and a pick-up through 1976-78. These external growth assumptions are embodied in the simulations of the CANDIDE model of the Canadian economy on which the 1973-77 performance indicators have been based.

The indications are that world inflation will be as much in evidence for 1974 as a whole as it was in 1973, although the price of some products could decline as a result of sluggish demand this year. The surge in oil prices began late in 1973, and the contribution of petroleum to inflation will be much greater this year than last. The same comment applies

5 For the United States, estimates of future growth of real output (both aggregate and in detail) are available from the Wharton Annual and Industry Forecasting Model. This model is used in simulations of our own model, CANDIDE 1.1. For Japan, an estimate of the growth of aggregate output to 1980 is available from a combination of short-term and long-term projections of the Japan Economic Research Center. Forecast data for Western Europe for the year 1974 are available from OECD sources. They indicate a widening of the gap between actual and potential output in 1974. A plausible time path for the growth of European output in 1974-80 can be projected by assuming that the European countries gradually reduce the gap between actual and potential output during that period.

6 The pattern of Chart 6-2 would be almost identical if the national production weights were employed rather than Canadian export weights. This happens to be the case because the United States and Western Europe are growing at about the same rate, and the two weights happen to be nearly the same for Japan.

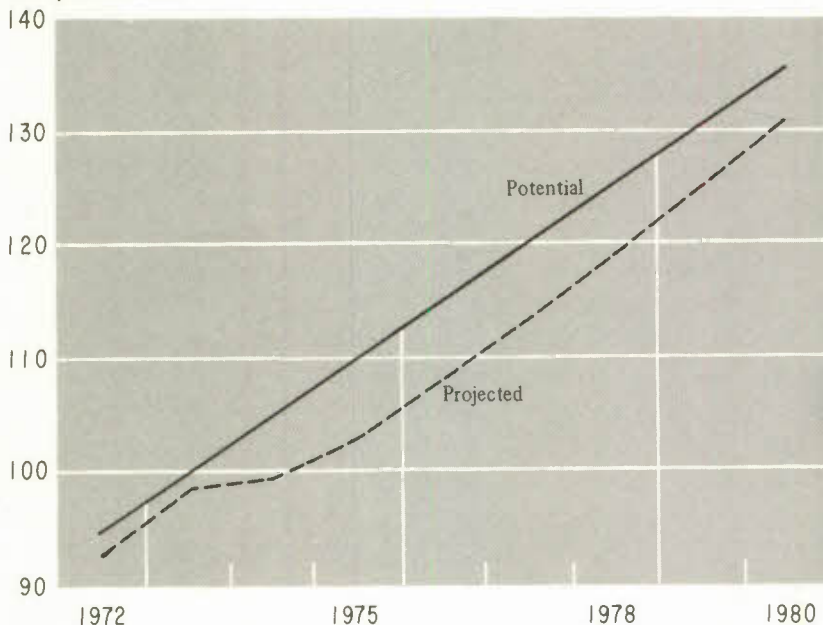
7 The rates of growth of potential output are taken from the work of the U.S. Council of Economic Advisers, the OECD, and the Japan Economic Research Center.



Chart 6-2

## Indexes of Real Gross National Product of OECD Countries, 1972-80

1973 potential=100



**NOTE** The two indexes are weighted averages of the national indexes of the United States, Western Europe, and Japan. The weights are taken from Canadian export data for 1973.

**SOURCE** Based on data from the Wharton Annual and Industry Forecasting Model (United States), the OECD, the Japan Economic Research Center, and the Economic Council of Canada.

essentially to a number of other commodities. Also, the moderating influences on commodity prices this year will not be comprehensive. In general, world inventories have been at low levels, and the slowdown in the growth of final demand in 1974 has been cushioned by buying for inventory. In the case of agricultural products, crops have been poor and food supplies have remained low in 1974.<sup>8</sup> Some perspective on expectations of U.S., Japanese, and British sources for the course of prices may be gained from Table 6-7. The price changes shown are in national currencies and therefore include anticipated effects of exchange rate movements.

<sup>8</sup> The deterioration of U.S. crop prospects in August 1974 makes it likely that grain supplies will be low and that prices will remain high. Canadian grain crop prospects also declined sharply in September.



**Table 6-7**  
**Change in Trade Prices, 1972-77<sup>1</sup>**

	1973	1974	1975	1976	1977	Annual Average 1972-77
	(Per cent)					
United States						
Goods and services						
Exports	14.5	24.1	9.4	4.4	4.0	11.0
Imports	18.1	29.5	9.5	3.5	3.5	12.5
						Annual Average 1972-75
Japan						
Goods and services						
Exports	9.0	35.3	15.9			19.5
Imports	18.3	55.6	16.2			28.9
Britain						
Goods only						
Exports	12.8	20.0				
Imports	28.4	43.0				

<sup>1</sup> Data are preliminary and subject to revision.

SOURCE Based on data from the Wharton Annual and Industry Forecasting Model; the Japan Economic Research Center; the National Institute of Economic and Social Research; and the OECD.

Available data imply a reduction in later years of the high rates of price increase occurring in 1973 and 1974. Apart from the belief that oil prices soared to unsustainable levels in the early part of 1974, these expectations are founded on the view that supply will respond (albeit with lags) to high price levels, while users will increasingly economize on the consumption of high-priced products. Further, slower growth of demand should produce some retardation in rates of price increase. Another notable point that emerges from Table 6-7 is that the projections imply a more rapid rise in import than in export prices for these industrial economies in 1974 and 1975. A breakdown of U.S. import prices indicates that they (other than oil prices) are generally expected to rise quite rapidly in 1976. In time, however, the current inflation of commodity prices will work through into the prices of manufactured goods. High world prices for commodities that Canada exports will continue for some time to impart strength to the Canadian balance of payments, but it is unlikely that the net gain from this source will continue indefinitely at the 1973 rate.

## THE PROSPECTS FOR INTERNATIONAL CO-OPERATION

If the prosperity of the past twenty years is to continue and is to be shared increasingly by all nations, skilful leadership and strong international co-operation will be needed in shaping the international trade and payments system. It is useful to discuss some key areas.

### The Trade Negotiations under GATT

The current GATT negotiations can move forward on a substantial scale, it seems to us, only if the United States provides strong leadership. The recent oil crisis exposed a lack of unity of purpose in this area within the EEC, which must also deal with internal issues such as the proposal of the British government to renegotiate Britain's terms of membership in the Community. Nor is Japan in a position to provide strong leadership. As for the prospects of a U.S. initiative, they have been clouded by the delay in enacting the necessary U.S. trade legislation. The legislation that has been proposed would provide the President with substantial negotiating authority, but it emphasizes reform of the world trading system, either through trade liberalization or through a tightening of U.S. barriers against imports. It is important that the President have authority to liberalize U.S. imports; otherwise the U.S. Administration would have power to raise import barriers but almost no effective authority to reduce them. Although nothing can be taken for granted, the attitude of the U.S. government, on balance, is to try to resolve problems by the negotiation of trade liberalization measures. The negotiations were originally scheduled for completion in 1975, but it now seems likely that positive results cannot be achieved before 1976.

### The International Monetary Fund Negotiations

Negotiations to reform the world monetary system are moving slowly. Although the danger of confrontation over the methods of managing the floating of national currencies is by no means absent, there seems to be quite a widespread political will among the industrial countries to make the interim arrangements work; in other words, although the system of floating exchange rates has generated some acrimony, there is little if any evidence of backsliding into protectionism.<sup>9</sup> A major testing time, however, is approaching with the build-up of liquid funds in the hands of oil exporters.

<sup>9</sup> Early in May, however, Italy imposed a temporary advance payment scheme for imports that appears equivalent to a surcharge of about 3 per cent but, by requiring traders to raise large sums of money, it may have a more restrictive effect on imports than this figure suggests.

### The Oil Crisis

The power that the Arab oil-exporting countries can exercise is more formidable in the short term than in the long term. Major Arab leaders have tacitly acknowledged this point by the respect they have shown for U.S. initiatives in the Middle East. The "oil crisis," however, still poses major problems for the system of world trade and payments. The effect of higher oil prices in 1974 could be to raise the import bill of noncommunist countries by more than \$U.S. 60 billion.<sup>10</sup> Most industrial nations will need to run a trade deficit because of this escalation of prices, and many developing countries face very serious difficulties in maintaining essential imports.

The oil money that cannot immediately be spent for consumption or development by relatively small countries will continue to flow into world capital markets. This is not necessarily unhealthy. But it does pose the problem of how to avoid destabilizing exchange-rate movements in the short run. In principle, the solution is to spread these capital funds around the world in productive long-term investments. One has, however, only to state the required solution to realize the immense complexity of the task. The oil-rich countries are making many bilateral deals for development programs and for arms, but there are bound to be tensions among the industrial countries in the joint efforts necessary to keep the multilateral system in good working order. It will also be increasingly necessary to assist those developing countries not benefiting from commodity price inflation for humanitarian and long-term international political reasons. Canada's stake in the viability of the multilateral system of trade and payments is very great indeed.

### CONCLUSION

Prospects for the growth of foreign economies are moderately good for the 1973-77 period as a whole. There is, however, an interim period in 1974 and 1975 when external growth will be sluggish, partly because of the short-term effects of the oil crisis and partly because of a slowdown in U.S. growth apart from the effects of the oil crisis.

High rates of inflation for many commodity prices are likely to continue, perhaps into 1975. The best hope of moderating inflation in the long run is through market-directed investment in additional productive capacity. Such investments, of course, must be supported by increasing the proportion of savings and decreasing the proportion of consumption in GNP so that consumption does not pre-empt resources required for the expansion of production.

10 In addition, the cost of imports to these countries is also affected by high prices for other commodities.

In contrast with the United States, Canada seems likely to enjoy moderate growth in 1974. Over the period to 1977, the increase in both the value and the volume of imports is likely to be maintained at high levels and, because of the continued price increases in prospect for 1974 and into 1975, the current-dollar value of exports should be well sustained during the period when export volume is stagnant. In volume terms, Canadian exports will tend to record a sluggish performance during the period of slow external growth and pick up afterwards. The shortfall in the volume of grain exports in 1973 is unlikely to be recouped in 1974.<sup>11</sup> Over the period to 1977, moreover, the average volume of grain exports will not be increased much above the 1972 level, unless future crop levels are substantially in excess of recent averages and unless transport facilities are improved. Exports of crude oil increased in volume by roughly 20 per cent in 1973. Prospects are that by 1977 they will be reduced in order to supply Canadian oil to the Montreal market. Increased exports of other commodities will, in many cases, require prior investment in new equipment and transportation.

International economic and financial relations are more or less in a state of actual or incipient upheaval. However, the institutions for international co-operation, and the habits of mutual consultation and negotiated compromise essential to the welfare of trading countries, leave us confident that the difficulties will be surmounted.

11 In calendar year 1973, despite strong external demand, the volume of grain exports was about 14 per cent below that of calendar year 1972.



## *Prices: Prospects and Issues*

The rate of price changes in the recent past has been extremely inflationary. Although it is clear that some special factors have been at work lately, there is danger that the duration and magnitude of these price changes could foster cumulative inflationary tendencies, especially if they are accompanied by compliant fiscal and monetary policies. Careful investigation of the changing causes of inflationary price movements is needed to ensure that responses to these movements do not substantially encourage their continuation. Thus, for example, steps to alleviate some of the burdens of current inflation are desirable, but their effects should be monitored to ensure that they do not in turn lead to widespread acceptance of the notion that rates of price increase comparable to those experienced since the end of 1971 are now unavoidable. Similarly, although the uneven incidence of gains in income since 1971 will perhaps lead to short-run "catch-up" behaviour in some areas, it is not inevitable that this should, in turn, result in acceptance of these short-term adjustments as a rationale for further inflationary pressures.

### THE PRESENT SETTING

One of the major contributions to inflation cited in the *Tenth Annual Review* was food prices. They continued to exert a very strong influence upon inflationary price movements throughout 1973 and the first few months of 1974. The strength of this influence is apparent from Chart 7-1, which illustrates the changes in the consumer price index and its food price component since 1956. Clearly, since the end of 1971, changes in food prices have markedly exceeded any changes experienced throughout the 1956-71 period in both magnitude and duration. For about thirty months, we have experienced persistent food price increases, so that by March of this year, the annual rate of change had reached 18.6 per cent – the largest increase in our historical survey. At that time, food price increases represented over 45 per cent of the change in the total consumer price index. Year-over-year percentage changes for major components of the food price index appear in Table 7-1. The very large increase in



**Table 7-1**  
**Annual Percentage Change in Some Components of the Food Price Index, 1972-74**

	Total Food	Dairy Products	Beef	Pork	Poultry	Fish	Eggs	Fresh Fruit	Fresh Vegetables
Weights in consumer price index <sup>1</sup>	.248	.033	.032	.018	.009	.004	.006	.011	.011
1972									
Q1	7.6	7.6	10.6	10.4	13.9	10.3	2.7	16.1	19.8
Q2	6.1	6.6	8.3	18.2	17.6	12.0	-1.3	9.2	-2.5
Q3	7.9	5.2	9.7	26.2	11.0	17.1	17.9	-1.0	8.3
Q4	9.0	2.7	8.3	28.1	15.3	20.0	14.0	9.9	11.5
1973									
Q1	10.4	4.0	12.1	27.4	17.3	19.8	35.1	11.2	17.1
Q2	14.7	8.2	17.8	24.4	25.8	18.2	48.0	19.4	39.9
Q3	15.5	8.9	25.7	29.2	38.7	19.4	44.9	30.9	29.7
Q4	17.4	8.6	27.4	27.5	44.2	33.9	47.5	28.2	5.5
1974									
Q1	17.3	7.3	23.2	13.8	33.2	34.5	30.8	25.3	5.8
Q2	17.1	11.7	12.3	-1.2	20.2	34.4	22.3	9.5	15.0

1 These weights are based on 1967 expenditure patterns.  
SOURCE Based on data from Statistics Canada.

**Table 7-2**  
**Contributions to Change in Consumer Price Index, by Component, 1972-74**

	Weights <sup>1</sup>	Annual Percentage Change				Average Annual Percentage Change				Share of Change in Consumer Price Index				Average Share Jan. 1972 to June 1974
		1972		1973		1974		1972		1973		1974		
		Jan.	June	Jan.	June	Jan.	June	Jan.	June	Jan.	June	Jan.	June	
Food	.25	7.8	17.4	10.0	16.0	7.0	8.8	43.0	44.1	47.2	38.3	44.9		
Housing	.31	4.8	8.8	5.3	7.0	7.5	10.1	31.1	24.0	29.9	24.0	26.2		
Clothing	.11	2.5	10.1	3.5	7.5	7.7	11.1	5.6	9.1	6.7	9.7	8.2		
Transportation	.15	4.7	11.1	0.8	7.7	6.5	8.3	11.4	12.7	1.6	14.7	8.3		
Health and personal care	.05	4.0	8.3	3.8	6.5	5.3	9.0	5.7	3.6	4.7	3.7	4.3		
Recreation and reading	.07	1.7	9.0	3.7	5.3	1.2	5.2	1.7	4.1	3.2	5.5	4.1		
Tobacco and alcohol	.06	2.1	5.2	4.3	1.2			2.6	0.8	4.5	2.8	3.1		
Total	1.00	4.9	11.4	5.7	9.1			100.0	100.0	100.0	100.0	100.0		

1 These weights are based on 1967 expenditure patterns and have been used for May 1973 onwards. Weights based on 1957 expenditure patterns were used prior to that date.

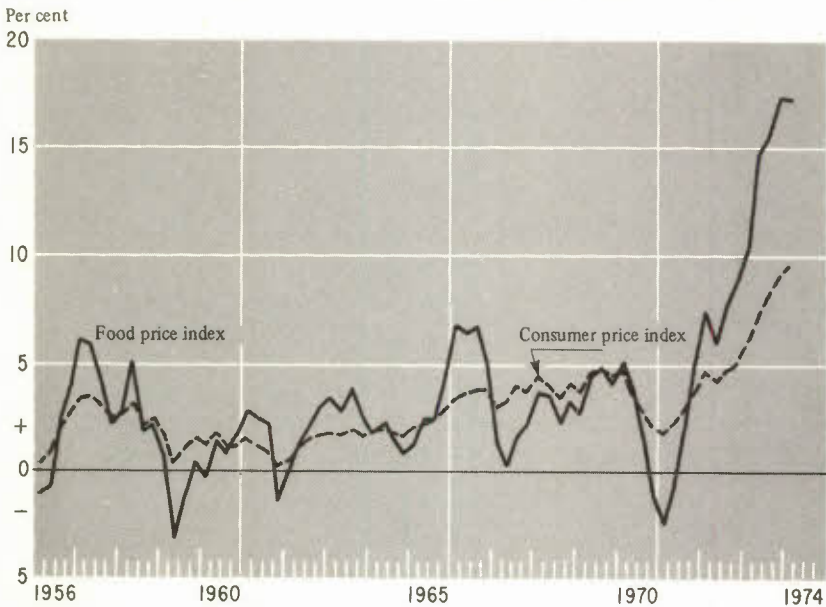
SOURCE Based on data from Statistics Canada.

prices for meat and poultry and their relatively heavy weight account significantly for increases in the food price index in 1972 and 1973. Although there was a deceleration in their rate of increase in the first half of 1974, particularly in the pork component, increases in the food price index nevertheless remain high – a result of price increases in fish, dairy products, and fresh fruit and vegetables.

Table 7-2 compares the contribution of food price increases to increases in the consumer price index with the contribution of other component price increases. Although housing price increases have accelerated, their share of the increase in the aggregate index has decreased. Transportation price increases have assumed a greater role, and clothing price increases have also become more important.

**Chart 7-1**

**Annual Percentage Changes in the Consumer Price Index  
and the Food Price Index, by Quarter, 1956-74**



SOURCE Based on data from Statistics Canada.

**THE IMMEDIATE OUTLOOK**

There are at least four areas in which specific developments this year could markedly affect the course of price movements during much of the 1973-77 period covered by the current performance indicators. These are: the size of feed crops at a time when world stocks are at dangerously

low levels; the direct influence of energy shortages on supplies of both intermediate and final goods; the indirect influence of the oil embargo and of increases in posted oil prices upon world liquidity, together with the incidence of large balance-of-payments deficits among the advanced economies; and the aftermath of the discontinuation of controls in the U.S. economic stabilization program.

World oil supplies have not been severely curtailed, apart from the temporary shortfall that immediately followed the declaration of proposed cutbacks in production and of an oil embargo on supplies from some of the oil-producing countries to certain oil-importing countries. However, this disruption of normal flows, and the uncertainties associated with it, has led to longer-term dislocations exceeding those anticipated on the basis of energy shortages alone. For example, shortages of some intermediate and final goods have been reported that may be considered direct consequences of the oil crisis. Prices of such goods have risen and will continue to rise until supply deficiencies have been eliminated. Clearly, some of these increases are unavoidable in the short run since necessary adjustments, in the form of diverting supplies to domestic markets from earlier areas of sales and of substituting certain consumer goods for others, take time to be completed. These price increases will continue into 1975.

As indicated by the simulations associated with the different scenarios considered in Chapter 5, an important direct influence on future price changes will be future oil prices, which of course will be substantially above their historical values. Price developments will depend critically upon whether oil prices reach a more stable level and upon the speed with which they approach this level. If, as seems likely, prices increase slowly, severe inflationary pressure from this source need not occur in the longer term.

An important aspect of the oil crisis – which has yet received little attention – is the role that economic factors played in the decision to raise posted oil prices. An important stimulus to a large upward adjustment was provided by the devaluation of the U.S. dollar, which, in the absence of some compensation, would have markedly affected the real unit value of oil exports from the producing countries. Since greater stability is now anticipated for the U.S. dollar exchange rate, this particular stimulus will not be operative in the indicator period. In stressing the effects of international factors on our own price performance, we would be remiss if we did not recognize that the oil-producing countries are also very vulnerable to external price developments, and these were quite unfavourable for many of the commodities they were importing prior to the jump in oil prices.

The direct financial repercussions of the increases in oil prices are discussed elsewhere in the Review. They represent a very significant potential source of international instability and may involve substantial adjustments to existing levels of exchange rates. The appreciation of the Canadian dollar compared with the U.S. dollar in early 1974 appears to be partly the result of capital inflows induced by Canada's greater self-sufficiency in energy and partly the result of improved terms of trade. This should lead to both a stronger current balance of payments and less reduction in the growth of real output than in most other industrial countries. The use made by the OPEC nations of their oil revenues will more directly affect other countries, but the Canadian economy cannot be fully isolated from its consequences. Increased oil revenues in excess of \$60 billion are forecast for 1974, and many OPEC countries have little ability to absorb these increases by expanding their purchases of goods and services.

Although several alternative courses of action might be followed by the OPEC countries,<sup>1</sup> it seems clear that some international agreements will have to be concluded in order to establish appropriate means to deal with this problem. Until some ground rules are established for financing the large deficits anticipated for Japan and many European countries, uncertainties will persist, as will the danger of rapid changes in the prices of internationally traded goods. The latter would represent an extension of the difficulties experienced in commodity markets in 1972 and 1973.<sup>2</sup> Since the Secretariat of the General Agreement on Tariffs and Trade (GATT) and the Secretary-General of the OECD have called for international co-operation in the fight against inflation, appropriate forums exist for the purpose of reaching international agreement. The immediate hazard of substantial price instabilities, stemming from the large balance-of-payments deficits and the associated disruption of trading patterns, should provide incentives to most countries to seek co-operative solutions and avoid competitive devaluations or increased protection.

There will also probably be significant "second round" effects of higher oil prices on real incomes in many countries. The transfer of very substantial real resources to the oil-exporting countries will undoubtedly exacerbate social tensions already aroused by the widespread inflation of recent years. In this respect, we should be in a relatively better position than the majority of our trading partners because of our self-sufficiency in energy, on balance.

1 A number of these have been cited by the OECD in its *Economic Outlook*, December 1973.

2 The role of these price changes in Canada and elsewhere is described in the *Bank of Canada Review*, June 1973.



The expiry of the Economic Stabilization Act, upon which the control program in the United States was based, has led to higher levels of wage settlements in the United States in 1974 and to a relatively large number of wage contracts being signed there. The increased costs have influenced prices in 1974 and will continue to affect them in 1975. Canadian prices will be affected both by direct increases in the prices of imported goods and by some wage-parity adjustments. However, the contribution of these settlements to Canadian inflationary pressures will be small unless the expiry of the Act is treated as a sign by both labour and management that the U.S. federal government has given up its fight against inflation.

### THE RELATIVE PRICE INDICATOR

A new relative-price indicator was introduced in the *Tenth Annual Review* (Chart 7-2). The proposal to adopt this indicator, which compares changes in the Canadian consumer price index with changes in the weighted average of the consumer price indexes of Canada's principal trading partners, was generally well received, both as a suitable reference point for monitoring the performance of Canadian prices and as a reminder of the important constraints imposed upon these prices by the "openness" of the Canadian economy. The proposal to adopt such an indicator was not intended to absolve governments from the responsibility of maintaining adequate price performance on the false premise that *all* the recent inflationary experience was attributable to external factors wholly beyond the government's sphere of control. Indeed, we suggested that Canada could well aim to do somewhat better than its major industrial competitors. What we sought was to encourage discussion of feasible price performance and to avoid acceptance of either imprecise objectives or absolute standards that become excessively demanding in our inflationary world environment.

Since its creation, the Council has been explicitly aware of the conditional framework of any absolute standards identified with its recommendations. In particular, in proposing a long-term price goal, the Council acknowledged its dependence upon the assumption of reasonable price and cost stability in the United States. This assumption is, unfortunately, as we noted last year, no longer a realistic one. The new relative-price indicator represented a provisional attempt to incorporate formally in our set of performance objectives a realistic assessment of the likely future external price environment. However, we continue to affirm another statement contained in the Council's *First Annual Review* – namely, that "developments within Canada can also have a major influence on

domestic prices."<sup>3</sup> Certainly, this statement is entirely within the spirit of the new indicator and its suggested boundaries. If Canadian policy-makers cannot substantially affect our price levels, there is no purpose to be served by the adoption of any type of price indicator.

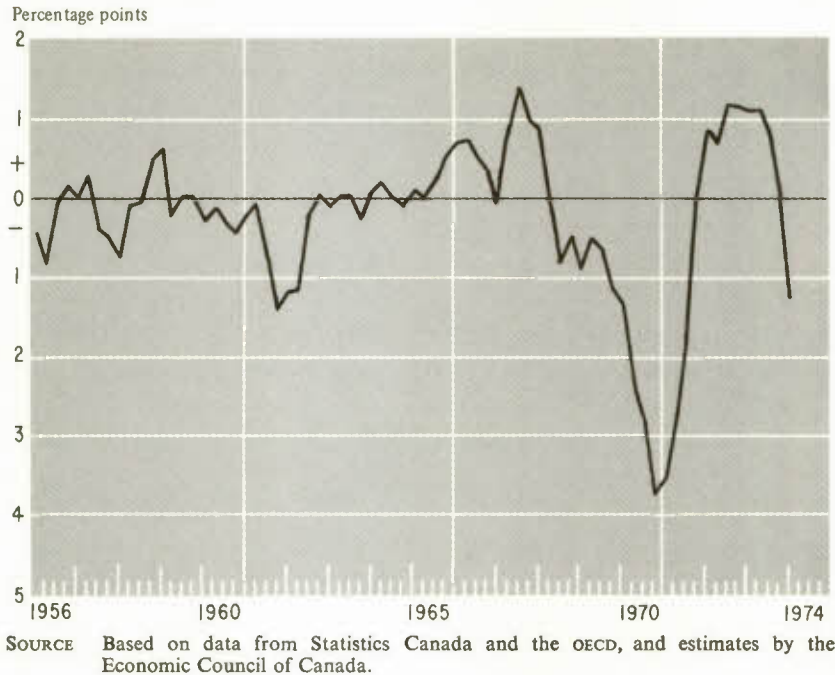
The purpose of international price-change comparisons may be to measure either changes in the domestic purchasing power of national currencies or changes in price competitiveness in international trade. The price indicator is concerned with the former changes and would need to be substantially altered if used for the latter. In particular, the price indexes of traded goods rather than the consumer price indexes would form important components for any assessment of competitiveness in goods trade; and adjustments for changes in the levels of exchange rates would be essential. Even with our emphasis on purchasing power, consumer price indexes will have some deficiencies for use in our price indicator because of international differences in expenditure weights, coverage, and sampling procedures, as well as in product characteristics. However, these price indexes are the best available measures, with regular publication and easy accessibility, for comparative use.

The choice of weights for these indexes is more questionable. We used the relative sizes of Canada's total bilateral trade with our principal trading partners over the period extending from 1968 to 1971. As such, these weights reflect the openness to goods trade of the Canadian economy but, as is clear from the various mechanisms for international transmission of price inflation, this choice does not reflect the full range of international interactions.<sup>4</sup> The four-year coverage of the trade weights was chosen in the hope of eliminating any undue emphasis upon particular developments in a single year. Current uncertainties will affect trading patterns, but the average proportions experienced during the indicator period are not expected to deviate substantially from those associated with our weights.

3 Economic Council of Canada, *First Annual Review: Economic Goals for Canada to 1970* (Ottawa: Queen's Printer, 1964), p. 104.

4 Mechanisms for the transmission of inflationary price changes between countries can be classified in a variety of ways. The OECD, in a recent report, distinguished the following classes: the effects of increases in the price of traded goods; the demand effects arising from the spillover of foreign demand at times of full employment; and the liquidity effects of the balance of payments on monetary conditions in a permissive policy environment. Other linkages would include multinational corporation and union links, and international inflationary expectation and demonstration effects. For further elaboration, see OECD, "The International Transmission of Inflation," *Economic Outlook*, July 1973. For a detailed account of the impact of international inflation on Canadian prices during the last few years, see *Bank of Canada Review*, December 1973.

Chart 7-2  
Canadian Relative Price Index, by Quarter, 1956-74



In the *Tenth Annual Review*, it was pointed out that use of the relative-price index within the indicator framework would necessitate a search for the information required to give it a numerical value:

The application of the price indicator assumes, of course, that medium-term forecasts of foreign price behaviour exist.... In future *Reviews*, we shall try to take account of external price prospects in the same way that we provide bases for all the other indicators.<sup>5</sup>

Although economywide econometric models exist for several of the countries in which consumer price indexes are used in the specification of the price indicator, we do not have adequate facilities to link these models explicitly with the CANDIDE model. In any case, such linkages are perhaps not required for our limited purposes. Instead, we chose initially to use the "Box-Jenkins" techniques and to supplement our results by referring to other, partly qualitative, sources of information. The Box-Jenkins techniques employ purely mechanical methods to predict future values of changes in consumer price indexes. The basic procedure involves

5 Economic Council, *Shaping the Expansion*, p. 67.

Chart 7-3

Annual Percentage Change in Consumer Price Index, by Quarter,  
Canada and Major Industrial Countries, 1956-74

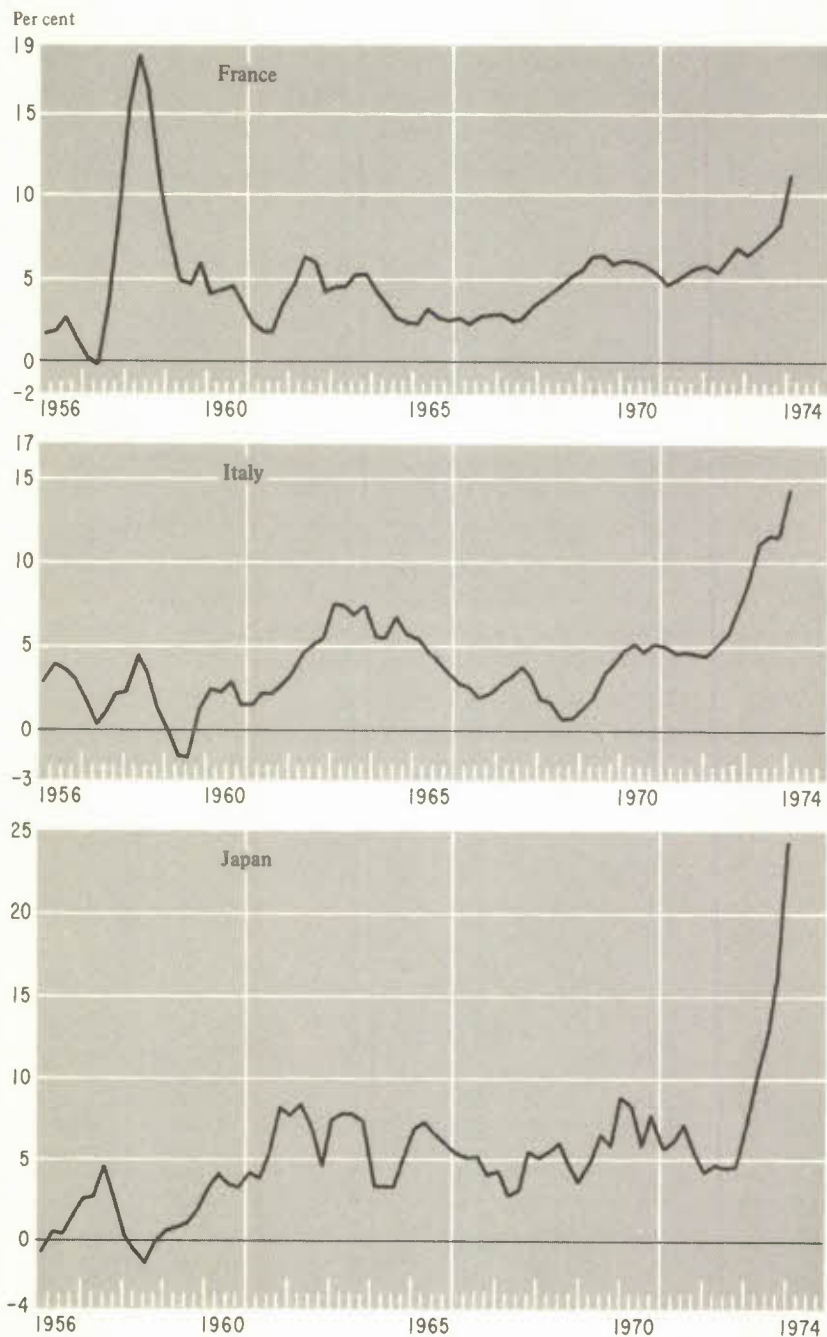
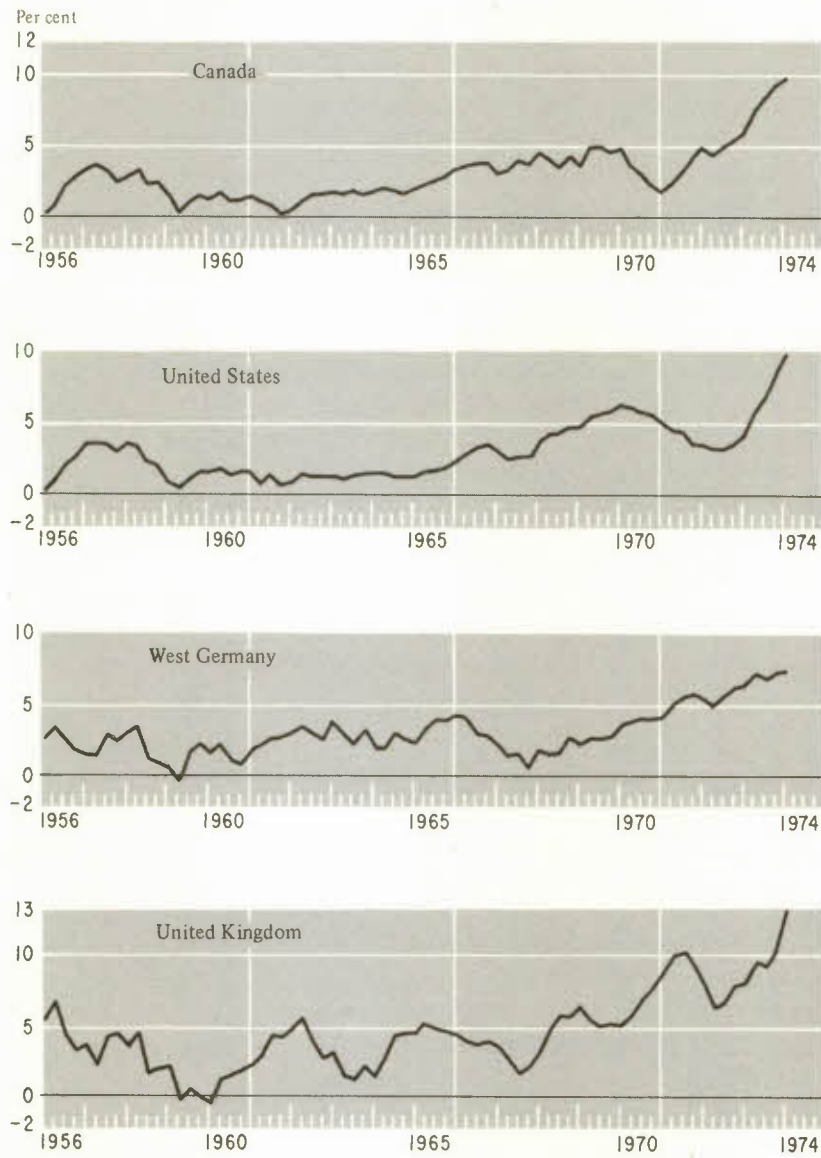


Chart 7-3 (cont'd.)



SOURCE Based on data from the OECD and Statistics Canada.



extrapolation of observed past behaviour, with no allowance for the presence of "other" explanatory variables. As such, the Box-Jenkins models are not based on economic theory and are void of explanatory power. They have, however, proved to be very successful in their ability to forecast, even by comparison with larger econometric models.<sup>6</sup> It is this good predictive performance, together with the straightforward methods of model specification, estimation, and diagnostic checks, that made the techniques appropriate for our initial purposes. The role of economic judgment is reserved for the final stage in which particular forecasts are formulated. These forecasts must be consistent with other available evidence.

Forecasts of annual rates of change from 1974 to 1978 in the consumer price indexes of the United States, United Kingdom, West Germany, France, Japan, and Italy are presented in Table 7-3. The bottom line of the table contains a weighted average of the increase in the consumer price index for these six countries. It should be noted that the further into the future, the faster the decline in confidence that may be associated with the forecast for a particular year.

**Table 7-3**  
**Provisional Forecast of Changes in Consumer Price Indexes,**  
**Canada's Principal Trading Partners, 1974-78**

	1974	1975	1976	1977	1978	Weights
(Annual percentage change)						
United States	9.0	7.1	5.8	5.8	5.7	0.81722
Japan	21.0	13.5	11.0	11.2	10.8	0.05079
France	10.5	9.4	8.6	8.5	8.4	0.01164
West Germany	9.4	8.9	7.0	6.8	6.5	0.02650
United Kingdom	11.8	9.6	10.0	9.4	8.9	0.08174
Italy	11.5	10.4	8.9	8.8	8.7	0.01211
Weighted average	9.9	7.7	6.5	6.5	6.3	1.00000

SOURCE Based on data from the OECD and estimates by the Economic Council of Canada.

These values suggest that inflationary price movements will continue at high levels throughout the indicator period. This is not surprising in

6 Some relevant evidence is presented in T. H. Naylor; T. G. Seaks; and D. W. Wichern, "Box-Jenkins Methods: An Alternative to Econometric Models," *International Statistical Review* 40, no. 2 (1972), pp. 123-37; and C. R. Nelson, "The Prediction Performance of the FRB-MIT-PENN Model of the U.S. Economy," *American Economic Review* 62, no. 5 (1972), pp. 902-17. Both present comparisons of forecasts based on Box-Jenkins techniques, the Wharton Econometric Model, and the FRB-MIT-PENN Econometric Model.

view of the recent pronounced acceleration of price increases in all countries as illustrated in Chart 7-3. Dislocations resulting from the energy situation and its repercussions are expected to persist through 1975, with more rapid return to lower levels of inflation in the United States and Germany than elsewhere. Given the relative advantages of Canada with respect to energy supplies and international liquidity, values for the changes in the Canadian consumer price index below the weighted averages of the changes in the consumer price indexes of our principal trading partners may well be achievable next year. However, to attain lower values, significant attempts will be required both to neutralize the international transmission of inflation and to contain inflationary pressures from domestic sources. Such attainment would be consistent with a target value for the relative price indicator in the lower portion of the band that we proposed last year for use with our price indicator. The achievement of significantly better Canadian performance assumes a marked reduction of inflationary pressures on the prices of both food and housing.

#### INDEXATION AND SAFEGUARDS AGAINST INFLATION

Since high rates of price change are likely to persist, at least for a while, the need to protect the real living standards of particular groups may be expected to continue. The recent indexation of personal income taxes and old age pensions, and other major federal programs, has alleviated some major problems associated with inflation. It is, however, appropriate to assess both the acceptability of these existing schemes and the possibility of devising alternative and additional ones. The existing schemes represent positive responses, in the case of old age pensions, to the needs of a particular group with generally slight income flexibility and, in the case of personal income taxes, to the general realization that the combination of a progressive tax structure and inflation was providing windfall tax gains for the federal and provincial governments, thereby redistributing private income to the government sector of the economy simply as a result of the inflationary process.

The present incidence of explicit indexation schemes varies widely between different levels of government and between the government and private sectors. About 90 per cent of all federal transfer payments to individuals are explicitly indexed, whereas the majority of provincial and municipal transfers outside Quebec are not. In the private sector, the occurrence of indexation is increasing but remains infrequent. For example, fewer than 10 per cent of the collective agreements recorded by the Department of Labour at the beginning of this year contain cost-of-living allowances.<sup>7</sup>

7 Labour Canada, *Collective Agreement Data*, Research Bulletin.

Government schemes allow for adjustments in pensions and tax payments based on changes in the consumer price index so as to reflect changes in the cost of living. A number of apparent difficulties, however, may be associated with the choice of this particular index.<sup>8</sup> The index is based on the pattern of final consumption of goods and services by a reference or target group of families living in urban centres with metropolitan population exceeding 30,000 people in 1967. Only the expenditures of families with 1967 incomes in the range of \$4,000 to \$12,000, and composed of two to six persons, are considered. Responses by such families to the 1967 Urban Family Expenditure Survey and the 1969 Food Expenditure Survey provide a collection of fixed expenditure weights for the consumer price index.<sup>9</sup>

The use of the consumer price index for indexing purposes may thus be criticized from two points of view: on the one hand, it is inadequately comprehensive; on the other, it is insufficiently specific. On the first point, there does not appear to be any evidence that movements of the consumer price index are significantly distorted in relation to what would be revealed by an index using a more broadly based weighting pattern. On the second point, however, it must be recognized that the index cannot always accurately reflect the impact of price increases on the expenditures of every group; it provides a measure of the average impact. When there are large divergences between the rates of price change for different goods and services, it is possible that indexation of all incomes by reference to the consumer price index will not safeguard all real living standards. (It is not, however, the purpose of indexation to do so, as we argue later.) Thus, for example, if the expenditure patterns of the recipients of old age pensions differ markedly from those of the target group, the indexation adjustment of pensions may appear either excessive or deficient, depending on the differences in expenditure patterns, the incidence of price divergences, and the purposes of indexation. Similarly, some indication of the changes in expenditure patterns associated with increased levels of nominal income is required if all the effects of price changes on real incomes are to be fully assessed.

Demands for greater selectivity in the choice of index might appear to be appropriate if changes in the consumer price index were found to deviate substantially from the actual price-change experiences of different groups – whether classified according to their incomes for tax purposes or by demographic or social characteristics – and if the sole purpose of indexation were the maintenance of the existing pattern of living condi-

8 J. Popkin, "Problems and Progress in Improving Measures of Wholesale and Consumer Prices," *Business Economics*, May 1973.

9 Statistics Canada, *The Consumer Price Index for Canada (1961 = 100)*, Revision based on 1967 Expenditures, Cat. No. 62-539.

tions. The existing scheme, apart from the problem caused by the inclusion of indirect taxes in the consumer price index, enjoys the advantages of simplicity, widespread acceptance, and independence from direct government intervention.

To explore potential differences in the incidence of price inflation confronted by distinct income classes, a new set of consumer price indexes was calculated. Selected values from each index are contained in Table 7-4. The 1969 Survey of Family Expenditures identifies representative baskets of goods for each of twelve income classes among all families of two or more individuals. These baskets form the bases for the price indexes reported in the table. Three factors must be noted here. First, the items included in each group's basket are the same as those in the consumer price index; only the weights differ. Therefore, the effect of price increases of commodities excluded from the index, but important to either high- or low-income groups, is not captured. Second, our procedure assumes that all income groups face the same prices. In contrast, it is sometimes argued that lower-income families pay more than higher-income families for the same goods.<sup>10</sup> Insufficient data exist to evaluate this argument. However, even if it were true, only the levels, as distinct from the rates of change, of the price indexes would be affected. The rate of increase of the indexes will not be affected if the prices of the higher-priced goods rise at the same rate as their lower-priced counterparts. Third, the commodity weights are those established only during the target period of the Expenditure Survey (1969).

Table 7-5 contains the annual percentage changes in these price indexes. Although the families in lower-income classes spend relatively more of their incomes on food, these fixed-weight indexes indicate less spread in prices between income classes than might have been expected in view of the substantial and persistent rise in food prices.<sup>11</sup> Consider, for example, two families – one earning less than \$3,000 per year, the other \$15,000 or more. In January 1969 the price index had reached 121.8 for low-income families and 122.6 for high-income families, where 1961 is defined as 100. In April 1974 these indexes were 162.7 and 161.4, respectively. Thus the index for low-income families was 1.3 percentage points higher than that for high-income families and 0.8 percentage points higher than the overall CPI (161.9). These differences are very small; thus it can be inferred that the incidence of inflation is about the same for all families,

10 National Council of Welfare, *Prices and the Poor* (Ottawa, April 1974).

11 This lack of spread stems, in part, from the fixity of the weights but also, one would think, from the rapid acceleration associated with the homeownership components of the consumer price indexes. When account is taken of both income and accommodation, greater variability in the levels of the indexes becomes apparent, but annual changes in these indexes are not markedly affected. These changes are usually within one percentage point of those presented in Table 7-5.



**Table 7-4**  
**Consumer Price Index, by Income Class, All Families of Two or More Persons, 1969-74**

Year ending	Income class (\$)											CPI
	Under 3,000	3,000- 3,999	4,000- 4,999	5,000- 5,999	6,000- 6,999	7,000- 7,999	8,000- 8,999	9,000- 9,999	10,000- 10,999	11,000- 11,999	12,000- 14,999	
	(1961 = 100)											
January 1969	121.8	121.7	121.4	121.5	121.5	124.4	121.7	122.2	122.0	122.0	122.6	122.6
January 1970	127.1	126.9	126.6	126.6	126.7	129.8	127.0	127.6	127.3	127.4	128.1	128.2
January 1971	128.9	128.5	128.3	128.4	128.5	131.9	129.1	129.9	129.7	129.8	130.8	130.3
January 1972	135.6	135.0	134.8	134.7	134.9	138.3	135.5	136.3	136.0	136.0	137.0	136.7
January 1973	143.8	142.8	142.4	142.1	142.2	145.8	142.7	143.7	143.1	143.1	144.1	144.5
January 1974	158.2	156.8	156.2	155.7	155.6	159.3	156.0	157.1	156.3	156.2	157.1	157.6
April 1974	162.7	161.2	160.6	160.0	159.9	163.8	160.3	161.4	160.6	160.5	161.4	161.9

**NOTE** There may be no weighted combination of the price indexes for the income groups between \$4,000 and \$12,000 that will produce the published CPI. This is due to the use of different weighting schemes. The price indexes for the income classes use 1969 expenditure weights, and the published CPI uses 1957 expenditure weights prior to May 1973 and a combination of 1967 and 1969 expenditure weights for May 1973 onwards.

**SOURCE** Based on data from Statistics Canada and estimates by the Economic Council of Canada.



**Table 7-5**  
**Percentage Change in Consumer Price Index, by Income Class, All Families of Two or More Persons, 1970-74**

Year ending	Income class (\$)												CPI
	Under 3,000	3,000- 3,999	4,000- 4,999	5,000- 5,999	6,000- 6,999	7,000- 7,999	8,000- 8,999	9,000- 9,999	10,000- 10,999	11,000- 11,999	12,000- 14,999	15,000- or over	
						( Percent)							
January 1970	4.31	4.28	4.26	4.25	4.27	4.33	4.44	4.37	4.40	4.41	4.40	4.51	4.57
January 1971	1.40	1.33	1.37	1.39	1.48	1.59	1.66	1.79	1.84	1.79	1.87	2.10	1.64
January 1972	5.23	5.06	5.03	4.95	4.92	4.89	4.90	4.92	4.86	4.85	4.80	4.80	4.91
January 1973	6.03	5.76	5.63	5.49	5.42	5.37	5.35	5.44	5.27	5.23	5.15	5.14	5.71
January 1974	10.06	9.79	9.71	9.52	9.42	9.31	9.30	9.28	9.17	9.19	9.10	9.02	9.07
April 1974	10.75	10.59	10.55	10.41	10.33	10.21	10.23	10.21	10.12	10.15	10.06	10.00	9.91

NOTE The percentage change in price indexes for income classes between \$4,000 and \$12,000 may all be less than (greater than) the percentage change in the CPI. This is due to the use of different weighting schemes. The price indexes for the income classes use 1969 expenditure weights, and the published CPI uses 1957 expenditure weights prior to May 1973 and a combination of 1967 and 1969 expenditure weights for May 1973 onwards.

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

whatever their income. Although further disaggregation to derive even more selective indexes would probably lead to a widening of the spread, the case for the widespread adoption of a multitude of different indexes does not appear strong, especially since other government measures can be adopted to deal with specific areas of need.

In addition to the foregoing evidence, it is appropriate to consider whether the purpose of indexation schemes is to compensate individuals and groups for the loss of general purchasing power arising from inflation, or whether it is to protect, indefinitely, their particular initial real living standards. If it is the latter, since relative price changes are always taking place – for example, because of different rates of productivity growth in different industries – a case would exist for tying particular categories of income to particular price indexes in order to preserve the real incomes of those involved, even in a situation of zero inflation. If, on the other hand, the purpose of indexation is to compensate for general inflation, then it appears most appropriate to employ a general index (such as the consumer price index) for this purpose. Clearly, many other schemes and programs are designed to preserve, modify, or improve the real living standards of particular income groups. It appears to us, however, that indexation is best directed towards the primary aim of compensating individuals for those losses of general purchasing power arising from inflation. Even a highly complex system of special indexes for particular groups would still give rise to anomalies and imperfections if the objective were to prevent each individual's initial real income from changing as a result of price variations. Apart from being administratively costly, special indexes might also introduce undesirable rigidities into our social and economic relationships.

With respect to the tax system, the role of indexation is not as simple as sometimes indicated. Without indexation, the proportion of income represented by income taxes will increase during a period of inflation without any change in real income or in statutory tax rates. This is a source of hidden gains to governments at the expense of all taxpayers, but especially at the expense of taxpayers whose incomes are subject to the steepest progressivity. Indexation of exemption levels and tax brackets may ideally eliminate these gains. It could not, however, ensure the preservation of the initial distribution of incomes since, under any system of fixed tax brackets, the distribution of after-tax incomes depends on the effective increase in nominal income. In addition, the elimination of "hidden" gains in government revenue removes options previously open to governments to reduce taxes or not to increase them. Losses in revenue because of indexation would thus lead to compensatory adjustments to nominal rates unless government expenditure plans were cur-

tailed, and they may also raise problems in the relationships between federal and provincial authorities.<sup>12</sup>

Existing schemes far from exhaust the possibilities for indexation, including some suggested by practice in other economies.<sup>13</sup> It is premature for us to elaborate upon our findings on various proposals since our research in this area remains incomplete. We should note, however, certain special needs associated with housing and corporate savings.

Rapid increases in house prices have created problems for persons who are currently nonowners and who wish to purchase a house. These problems will persist, especially if interest rates on mortgages continue at high levels. Although some existing programs assist with mortgage payments and increase the supply of relatively low-cost new housing, some consideration should be given to a careful analysis of new approaches in this area. Otherwise, we may face a situation in which an increasing proportion of the younger and poorer sections of the population will be unable to choose whether or not to own a house. Such approaches might involve the federal subsidization of particular savings, as in the French housing-savings program; new institutional arrangements with respect to mortgage financing, whereby initial premiums are reduced in exchange for later flexibility in either the level of interest rates or the level of borrowed principal; and attempts by selective credit measures to insulate the housing market from some of the disturbances in the rest of the economy.

We have noted elsewhere the need for funds to support desirable capital investment programs. One source of such funds could stem from the increased corporate savings that might arise if indexation schemes were extended to the corporate sector. Thus amendments to existing tax laws, such as those concerning capital allowances based on the initial cost of equipment, and inventory valuations, could result in a greater flow of funds to finance desirable investments. These amendments would be potential alternatives to further acceleration of existing capital allowances and to reductions in the corporate tax rate. Adoption of such amendments would, however, have to be carefully balanced against alternative corporate and noncorporate sources of additional savings and must be viewed in the light of all economic and social objectives.

- 12 Large losses for provincial governments have been forecast, under 6 per cent inflation, by the Ontario Ministry of Treasury, Economics and Intergovernmental Affairs, in *The Dynamic Impact of Indexing the Personal Income Tax*, January 1974.
- 13 Partial surveys of indexation schemes have been provided by the United Nations Economic Commission for Latin America in "Index Clauses in Deferred Payments," *Economic Bulletin for Latin America*, October 1957; by F. D. Holzman, "Escalation and Its Use to Mitigate the Inequities of Inflation," in *Inflation, Growth, and Employment*, papers prepared for the U.S. Commission on Money and Credit, 1964; and by D. Finch, "Purchasing Power Guarantees for Deferred Payments," in *IMF Staff Papers*, February 1956.

Some significant questions are raised by the topics touched upon in this chapter. These involve very fundamental social choices that need to be made carefully. During a period of severe inflation, substantial transfers of real income and wealth can take place among various groups in society, causing social tensions and political unrest, often leading to breakdowns in traditional institutional arrangements and demands for increased government participation. Indexation of incomes, either by legislative action or market mechanisms, can help to alleviate some of these tensions and perhaps reduce the extent of inflation-induced imbalance in resource allocation. It is not a comprehensive response to inflation, since it does not remove its causes. We will pursue our investigation of the issues.

# 8

## *Industry Prospects to 1982*

In this chapter we continue and extend the analysis of industrial trends initiated in Chapter 7 of the *Tenth Annual Review*. In the first section we again compare the output, employment, and productivity performance of the major sectors included in aggregate Real Domestic Product and present projections for the periods 1973-77 and 1977-82. Following this, we introduce estimates of the stock of fixed capital, by sector, in an attempt to include physical productive capacity in our work. This analysis is completed by a brief presentation of the trends in the structure of Canadian industry. Industry prospects and problems, as envisaged by the participants in the 1973 National Economic Conference, are summarized in the second half of this chapter.

### REVIEW AND PROJECTIONS OF MAJOR INDUSTRIAL SECTORS

#### **Output, Employment, and Productivity**

The year 1973 was remarkable in several respects. Growth in real output was 6.8 per cent, the highest increase since 1966. This expansion was reflected mainly in employment growth, which reached a record value of 5.2 per cent. The recorded productivity gain of 1.6 per cent for the economy as a whole, measured in terms of output per person employed, remained substantially below its long-term trend value, as has been the case for some time.

Table 8-1 puts 1973 performance in a longer-term perspective. It shows average growth rates of output, employment, and productivity for eleven industrial sectors over selected periods and includes projections for the 1973-77 and 1977-82 periods. The 1960-64 period is also shown because a comparison of this period of expansion with that of recent years is quite illuminating. Overall, the table indicates a striking change in emphasis from productivity to employment as a source of output growth in recent years. This appears to be because there was considerably less slack in the



system at the beginning of the recent expansion than in the early sixties. As a consequence, when demand stepped up, output growth could not achieve the same rapid pace as in the 1960-64 period. A larger part of the output increase was obtained by additions to labour than by more intensive use of labour and capital. The latter would have necessarily resulted in higher productivity gains.

Table 8-1

Growth Rate of Output, Productivity<sup>1</sup>, and Employment, by Sector, 1948-82

	Ranking 1948-70 <sup>2</sup>	Actual			Ranking 1973-77 <sup>2</sup>	Projections	
		1948-70	1960-64	1969-73		1973-77	1977-82
		(Per cent)				(Per cent)	
Utilities							
Output	1	8.4	6.3	8.6	2	6.9	6.1
Productivity		5.1	6.0	6.4		6.1	6.6
Employment		3.3	.7	1.8		.8	-.4
Mines, quarries, and oil wells							
Output	2	6.5	6.4	7.4	1	7.0	3.9
Productivity		4.9	8.3	6.6		4.5	6.7
Employment		1.4	-2.8	1.0		2.4	-2.5
Transportation, storage, and communications							
Output	3	5.5	6.4	7.0	4	5.7	5.0
Productivity		3.7	5.0	3.8		4.0	4.7
Employment		1.6	1.3	3.0		1.6	.2
Manufacturing							
Output	4	5.4	7.6	5.3	6	5.4	5.0
Productivity		3.3	3.6	3.1		3.9	3.9
Employment		2.0	3.8	2.0		1.5	1.1
Finance <sup>3</sup>							
Output	5	5.4	5.8	5.0	5	5.5	5.3
Productivity		.7	1.9	1.1		1.0	.7
Employment		4.6	3.8	3.8		4.5	4.5
Community, business, and personal services							
Output	6	5.3	5.6	4.1	8	4.7	4.7
Productivity		-1.1	-.2	-.2		.2	-.2
Employment		6.2	5.7	4.4		4.5	4.9

Table 8-1 (concl'd.)

	Ranking 1948-70 <sup>2</sup>	Actual			Ranking 1973-77 <sup>2</sup>	Projections	
		1948-70	1960-64	1969-73		1973-77	1977-82
		(Per cent)				(Per cent)	
Wholesale and retail trade							
Output	7	5.0	5.3	5.5	7	4.9	4.6
Productivity		2.0	3.2	1.6		1.9	1.7
Employment		2.9	2.0	3.8		3.0	2.9
Construction							
Output	8	4.9	4.7	4.3	3	6.8	4.4
Productivity		2.6	2.7	.9		2.2	3.0
Employment		2.5	1.9	3.4		4.4	1.5
Public administration and defence							
Output	9	3.4	2.3	5.0	11	4.2	3.7
Productivity		0.1	.1	— .6		— .3	— .2
Employment		3.7	2.2	5.6		4.5	4.0
Forestry							
Output	10	2.7	3.7	2.2	10	4.3	5.1
Productivity		4.2	7.4	2.1		4.3	3.9
Employment		—1.0	—4.4	— .1		— .1	1.2
Agriculture							
Output	11	1.4	4.6	1.9	9	4.5	3.9
Productivity		4.6	6.8	5.3		7.0	6.4
Employment		—3.4	—2.0	—3.3		—2.4	—2.4
Total economy <sup>4</sup>							
Output		5.1	5.9	5.3		5.5	4.8
Productivity		2.6	3.1	2.1		2.4	2.0
Employment		2.4	2.6	3.0		3.0	2.7

1 Productivity is measured as Real Domestic Product per person employed.

2 The eleven sectors are ranked according to the rate of output growth.

3 Includes imputed rent on owner-occupied dwellings. The difference between these numbers and those in Table 7-1 of the *Tenth Review* is due to substantial data revisions in this sector, primarily for housing. This change entails revised estimates of Real Domestic Product and aggregate productivity.

4 Includes fishing.

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

In terms of output growth by industry, utilities, mining, and transportation have maintained their position as leaders almost without interruption in the three selected historical periods. Manufacturing has performed only moderately in recent years – particularly because of a drop in output of durables in 1970 – and services and construction have fallen behind. The rate of expansion of the public sector has recently been significantly above its longer-term trend.

With respect to employment, the community, business, and personal services sector recorded the most significant slowdown, partly because the tremendous expansion of education came to a virtual standstill around 1970. Since the service sector employs over 25 per cent of the labour force and, as a whole, registers low productivity gains, one would expect employment growth for the total economy in recent years to be below average values and output increases to coincide with relatively high gains in productivity. In fact, as we have seen above, the opposite was the case. This points to relatively poor productivity performance in other sectors, notably manufacturing, construction, transportation, and trade. A comparison of recent performance with the 1960-64 period is particularly striking; whereas at that time the performance of these four industries was better than their longer-term average, recently for three of them it was worse, since only the transportation sector achieved its average performance. In 1973 manufacturing and construction accounted for over one-third of the total increase in the number of employed persons, which is exceptional by any standard and reflects continuing slow growth in productivity.

Our projections in Table 8-1, which are based on scenario B in Appendix B, are influenced by these observations on recent performance. In particular, our estimates of productivity are more modest than those in Chapter 7 of the *Tenth Review*. This revision to the projection of productivity has ramifications for the whole economy, with growth in real income slowing down, cost increasing, and relative factor costs changing over time in each sector. In the longer run the level and composition of demand will be affected as well. As in the previous two Reviews, we have used the CANDIDE model to trace those impacts.

The CANDIDE projections are intended to be realistic in the sense that relevant information about the past performance of the industries, their interrelationships, the general state of the economy, and important phenomena such as inflation and the energy situation have been taken into account. On the other hand, this is also a target-setting operation, in that these projections are consistent with the performance indicator values set out in Chapter 3. The projections are not, therefore, to be seen as forecasts of future developments; rather they represent what is considered possible and fairly optimal in relation to the main objectives of economic policy.

Subject to the preceding qualifications, the medium-term outlook is for a sustained, fairly rapid increase of industrial output. Mining and utilities

retain the lead, combining strong output growth with rapid productivity advances. The construction sector moves into third place because of the anticipated continued expansion of business nonresidential investment. Output should grow roughly in line with longer-term trends in transportation; manufacturing; finance; trade; and community, business, and personal services. Forestry and agriculture are estimated to better their longer-run average performance because of sustained high worldwide demand for their products.

For the longer term we anticipate a slowdown in the rate of output growth. In our projections both aggregate employment and productivity growth drop slightly compared with the medium term. The rate of labour force growth slows down because of demographic developments and, while many industries are anticipated to make substantial productivity gains, the continuing shift of employment to industries with low productivity levels has an adverse effect on the productivity growth performance of the economy as a whole. The decline in the rate of output growth is most striking in the mining sector. This is related to weakness in foreign markets for mining products and to the decline in domestic oil production, which is discussed in the scenarios on energy in Chapter 5.

### **Investment and Capital Stock**

Table 8-2 provides estimates of growth rates of output and capital stock for ten industries in the private sector<sup>1</sup> in an attempt to draw productive capacity into the analysis. Some caution is, however, in order. The capital stock series are derived by cumulating the volume of fixed capital investment from year to year, with allowance for discards based on the assumption of a fixed average productive lifetime for past investments. Productivity of the different "vintages" of investments is not separately assessed, but is assumed to be constant. Moreover, since investment is measured when put in place, and not when it becomes fully productive, the capital stock, as measured here, is bound to "lead" productive capacity by a perhaps substantial and possibly variable period of time.

Table 8-2 also shows that, for half the industries, the long-term growth trend of capital stock exceeds the rate of output growth. Among the other half are utilities and transportation, sectors in which heavy investment took place in the early and mid-fifties. For the private sector as a whole, the ratio of capital to output is constant.

1 The total economy less public administration and defence, education, health, and housing services.

Table 8-2

## Growth Rate of Output and Capital Stock in the Private Sector, 1948-82

	Actual			Projections	
	1948-70	1960-64	1968-72	1973-77	1977-82
(Per cent)					
Agriculture					
Output	1.4	4.6	3.6	4.5	3.9
Capital stock	2.4	.8	2.0	5.5	3.7
Forestry					
Output	2.7	3.7	-1.0	4.3	5.1
Capital stock	4.7	3.9	3.9	4.1	5.7
Mining					
Output	6.5	6.4	6.6	7.0	3.9
Capital stock	9.5	9.1	8.5	9.2	8.3
Manufacturing					
Output	5.4	7.6	4.2	5.4	5.0
Capital stock	5.0	3.6	4.8	5.9	6.8
Construction					
Output	4.9	4.7	3.4	6.8	4.4
Capital stock	4.5	1.6	4.9	4.1	5.5
Utilities					
Output	8.4	6.3	8.8	6.9	6.1
Capital stock	6.8	5.4	6.6	8.1	8.4
Transportation, storage, and communications					
Output	5.5	6.4	6.2	5.7	5.0
Capital stock	3.3	2.4	3.9	5.4	6.0
Trade					
Output	5.0	5.3	4.8	4.9	4.6
Capital stock	4.9	3.6	3.1	3.1	2.6
Finance <sup>1</sup>					
Output	4.9	5.6	5.0	5.4	5.2
Capital stock	9.0	8.7	7.8	7.5	8.1
Community, business, and personal services <sup>2</sup>					
Output	4.0	4.5	4.4	5.6	5.5
Capital stock	7.2	7.1	7.8	7.9	7.2
Total private sector					
Output	5.0	6.1	4.8	5.7	4.9
Capital stock	5.0	3.9	5.2	6.5	6.8

1 The output measure excludes owner-occupied housing, but includes productive services of rental buildings. The capital stock for this sector excludes all residential structures.

2 Excludes health and education services.

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.



When we compare recent years with those of the early sixties, we again find remarkable differences. From 1960 to 1964 there was substantial output growth in most sectors, accompanied by slower expansion of the fixed capital stock. In recent years, both capacity and output have been growing approximately at trend rates. This suggests strongly that there was much more slack in the economy at the beginning of the sixties than around 1970, tying in with our earlier observation on the slow pace of productivity growth in recent years.

Our projections indicate a stronger expansion of productive capacity for the private economy, particularly in mining, utilities, and transportation. This reflects the sizable investment anticipated for oil and gas exploration, mining development, James Bay and other hydro and nuclear projects, and pipeline construction. In the manufacturing sector, the projected pick-up in the growth of capital stock compared with the 1948-70 period is greater than that in output, suggesting that capacity utilization may decline somewhat over the next several years from its present high level.

The strong expansion of capital stock is expected to be sustained in the longer run. Not only is the bulk of the energy-related investment to be put in place during the years 1977-82, but other industries will also be investing heavily in plant and equipment. This suggests a shift towards more capital-intensive methods of production intended to offset the slowdown in labour force growth.

### Industry Structure

The implications of these projections for the industrial structure of the Canadian economy in 1982 are displayed and compared with the past in Table 8-3. The decline in the share of agriculture in output, employment, and capital stock is expected to continue, although less rapidly. Relative output gains for mining and utilities are associated with a larger share of total productive capacity for these industries. The manufacturing sector is expected to produce a slightly larger proportion of total output with a slightly lower share of employment and capital. While the community, business, and personal services sector is expected to experience some reduction in its share of total output, it is still the major source of employment growth. In comparison, however, with our projections for the *Ninth Review*, the estimated rise of employment in this sector is much less dramatic<sup>2</sup> – a change that results from the more refined output projections

2 Economic Council of Canada, *Ninth Annual Review: The Years to 1980* (Ottawa: Information Canada, 1972), p. 62; and *The Economy to 1980: Staff Papers* (Ottawa: Information Canada, 1972), p. 239. Note that the two tables are not directly comparable, since our projections extend to 1982, two years beyond the horizon in the *Ninth Review* and the *Staff Papers*.

**Table 8-3**  
**Distribution of Real Output, Employment, and Capital Stock, by Sector, 1960-82**

	Real Output			Employment			Change in Number of Employed, 1973-82 (Thousands)	Capital Stock		
	1960	1970	1982	1960	1970	1982		1960	1970	1982
	(Per cent)							(Per cent)		
Agriculture, forestry, fishing	6.7	4.7	4.5	13.3	7.6	4.3	-85	13.3	9.9	7.2
Mines, quarries, and oil wells	4.6	4.7	4.8	1.6	1.6	1.0	-5	6.2	9.1	11.8
Manufacturing	24.9	26.3	26.7	23.8	22.7	19.6	235	25.0	25.5	24.4
Construction	6.0	5.4	5.7	6.5	6.0	6.1	135	2.0	1.6	1.4
Utilities	2.8	3.4	4.0	1.2	1.1	.9	0	12.7	14.6	18.2
Transportation, storage, and communications	9.5	10.3	10.6	8.4	7.7	6.5	55	25.3	21.0	19.2
Trade	12.8	12.3	12.5	17.1	16.8	17.1	430	7.2	6.5	4.4
Finance and housing	11.7	12.2	12.2	—	—	—	200	—	—	—
Finance and rental housing	7.6	7.8	7.9	3.8	4.6	5.4	—	2.8	4.3	5.0
Owner-occupied housing	4.1	4.4	4.3	—	—	—	—	—	—	—
Community, business, and personal services	14.2	15.4	14.3	18.6	25.7	31.6	1,270	—	—	—
Health and education	6.7	8.1	7.1	—	—	—	—	—	—	—
Other	7.5	7.3	7.2	—	—	—	—	5.3	7.5	8.6
Public administration and defence	7.0	5.4	4.7	5.8	6.2	7.5	265	—	—	—
Total economy	100	100	100	100	100	100	2,500	100	100	100

1 Figures may not add to 100 per cent because of rounding. Capital stock pertains only to total private economy (excluding housing).

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

that we have introduced since then. By the same token, the employment share of manufacturing does not decline as much in our more recent projections because of a reassessment of productivity trends.

In Table 8-3 output and employment shares are directly comparable; however, the last three columns of the table should be interpreted cautiously. Capital stock, as defined there, does not include dwellings, schools and universities, hospitals and buildings and capital equipment of the public sector. Therefore, the numbers only indicate shifts in the relative shares of the "private" capital stock, excluding housing.

### MEDIUM-TERM PROSPECTS

This section, more qualitatively descriptive than the previous one, brings out the salient features of the prospects envisaged by each industry group participating in the 1973 National Economic Conference. It should be clear from the outset that this survey is not intended to be exhaustive, but the selection of features is indicative of at least some of the major hopes and concerns of the decision-makers that participated in the Conference. The Council's projections in Table 8-2 have not yet been subjected to a comprehensive review by the 1974 Conference committees;<sup>3</sup> this assessment is in progress. The text, therefore, simply summarizes the views of some industry spokesmen and their recommendations, as expressed at the 1973 Conference, and points out some of the divergences between Council projections and industry expectations.

#### Agriculture

With continued strong world demand for agricultural products, prospects for Canadian agriculture are seen as excellent. Industry spokesmen felt, however, that the projected growth rate of farm production shown in Table 8-4 may be too optimistic. Costs of production are expected to escalate, reflecting higher costs of energy, fertilizer, other materials, labour, capital equipment, transportation, and financing. In the face of these rising costs, income maintenance and stabilization – goals that are widely accepted – remain a central issue for farmers. The increased use of marketing boards was seen as a possible way to achieve greater stability of farm income, as was long-range national planning of supply and demand of agricultural products.

3 These projections are a by-product of the projections in the first half of this chapter. They are, therefore, compatible with the view of economic prospects discussed in the chapters dealing with energy and the revised performance indicators.

Table 8-4  
Outlook for Sixteen Industry Groups, 1973-82

	Average Annual Growth, 1973-77		Average Annual Capital Outlays, 1974-77	Average Annual Growth, 1977-82	
	Real Output	Capital Stock		Real Output	Capital Stock
	(Per cent)		(Millions of 1972 dollars)	(Per cent)	
Agriculture	4.5	5.5	1,700	3.9	3.7
Food and beverages	4.4	5.2	510	4.2	5.1
Wholesale and retail trade	4.9	3.1	690	4.6	2.6
Forest products					
Forestry	4.3	4.1	160	5.1	5.7
Wood products	3.7	6.9	240	4.3	7.6
Pulp and paper	4.4	7.6	1,080	4.8	8.5
Mining					
Primary iron and steel	8.0	4.4	570	4.4	5.4
Nonferrous metals	6.6			5.9	
Metal mines	8.1			6.6	
Nonmetal mines (excl. energy)	5.8			5.1	
Energy		9.2	2,570		8.3
Oil and gas mining	5.2			-0.6	
Coal mining	14.0			8.8	

Petroleum and gas refining	5.4	6.8	310	5.1	10.6
Gas distribution	5.0	9.2	270	4.6	10.3
Electricity	7.3	8.0	3,130	6.4	8.3
Chemicals	5.4	5.8	430	5.9	5.8
Textiles and clothing					
Textiles	3.4	4.2	170	4.5	4.5
Clothing	3.3	2.7	40	4.9	5.1
Machinery and metal fabricating					
Machinery	7.8	6.0	110	4.3	5.5
Metal fabricating	6.2	4.9	200	4.6	5.5
Construction	6.8	4.1	420	4.4	5.5
Electrical products	5.5	5.2	150	5.6	5.7
Transportation and transport equipment					
Transportation	5.9	4.5	2,100	4.9	5.9
Transport equipment	4.9	5.5	290	4.6	6.7
Communications services	5.0	7.0	1,270	5.1	6.3
Financial services	5.4	7.5	900	5.2	8.1
Education	3.2	n.a. <sup>1</sup>	n.a.	3.4	n.a.
Health services	4.9	n.a.	n.a.	4.8	n.a.

1 Data not available.

SOURCE Based on estimates by the Economic Council of Canada.



The Agriculture Committee placed high priority on an improved transportation system and on removal of transportation constraints that affect Canada's agricultural potential. It called for a more realistic freight-rate structure and a reassessment of the overall transportation system in order to increase its capacity, particularly of railroad rolling stock and grain-handling facilities.

The Committee saw the need for reconsidering methods of acquiring and holding farm properties. New programs were seen to be necessary to provide the capital required to begin farming, as well as to finance not only plant and equipment, but also operations throughout the agricultural season. The committee recommended that integrated short-, intermediate- and long-term credit programs be instituted. They also thought that alternative land tenure, and possibly ownership patterns, should be examined in order to overcome the problem of encroachment on agricultural land, which affects farm output, the price of farm produce, and the financing requirements of agriculture. The Committee, while acknowledging that land-use planning and zoning are mainly the responsibility of provincial and municipal governments, recognized a need to develop generally accepted national guidelines.

### **Food and Beverages**

A fairly high and sustained capital investment expenditure program over the next few years is anticipated, as the processing of agricultural products continues on its expected stable upward trend. The industry also saw the need, however, to find ways to improve productivity. The Committee recommended continuation of the corporate federal tax reduction implemented in 1973 and better co-ordination of industry activities, so that governments would be able to assess the total impact of proposed policy changes and resolve conflicts among government departments and legislative discrepancies among different levels of government. The industry spokesmen hoped the government would continue to press for reductions in tariff and nontariff barriers, which inhibit international trade in food products.

### **Wholesale and Retail Trade**

Steady growth in output was indicated by the Retail and Wholesale Trade Committee for the distributive trades, which tend to grow in line with consumer demand. The Committee felt that capital expenditures in that sector would remain at a high level, partly reflecting technological advances. For this reason, the corporate income tax differential between

manufacturing enterprises and between operations and service industries is regarded unfavourably by the retail and wholesale sectors. The Committee felt that if this differential were perpetuated for any length of time, it might be difficult for the distributive trades to acquire the capital needed for modernization and expansion. The Committee therefore recommended that differential corporate tax rates be eliminated as soon as possible.

The Committee regarded as inappropriate the application of the federal tax to distributive machinery, fixtures, and fittings. It was also pointed out that the collection of provincial sales taxes places a considerable burden on the retailers, and it was suggested that retailers, as sales tax collectors, should be adequately remunerated for their efforts.

One of the major difficulties experienced by the distributive trades is their inability to recruit sales people with adequate talent and motivation. For this reason the Committee recommended that combined academic and practical professional training and apprenticeship programs be made available, both for new entrants and for those already employed who must cope with new methods and equipment.

### **Forest Products**

Having passed through a difficult period of overcapacity, low world prices, and revaluation of the Canadian dollar, demand for forest products recovered substantially, and the sector was operating at capacity at the end of 1973. The Committee anticipated further growth in output of 3 to 4 per cent per year, somewhat less than in the Council's projections. Because this sector is heavily oriented towards world markets, the Forest Products Committee members expressed concern about the relative burden of taxation borne by the industry in comparison with their competitors in the United States and Scandinavia. Transportation costs and conditions of access to world markets were also of critical concern to the spokesmen. The Committee recommended that governments avoid encouraging expansion of noncompetitive plants to serve local and regional development policies and also that the industry and governments co-operate in efforts to ensure adequate supplies of trained manpower.

### **Mining**

Projections, such as those in Table 8-4, for mining (excluding energy) seem somewhat optimistic to the Mining Committee. While Canada has tremendous potential for mining development, the Committee spokesmen contended that the climate for exploiting it was unfavourable and called for long-term stability of economic policies. To translate into coherent

policies the April 1973 Statement of National Mineral Policy Objectives issued by the federal government, some form of mechanism for consultation between federal and provincial governments in co-operation with industry representatives was recommended.

The Committee drew attention to the increasing remoteness of resources and to the higher costs of bringing Canada's minerals to users, and it asked that government tax and royalty policies recognize that Canada's competitive advantage as a supplier of minerals will be eroded by this reliance on higher-cost resources. Like the Forest Products Committee, the Mining Committee recommended that tariff and nontariff barriers to Canadian mineral exports should be vigorously attacked within the framework of GATT. In concert with other resource industries, the Committee also recommended that environmental standards be adopted only when they are financially and technologically attainable within a realistic time frame.

Conference delegates from the United Steelworkers of America, as did delegates from organized labour in some of the other committees, expressed disagreement with some aspects of the Mining Committee's assessment of the outlook. They suggested that total employment and capital investment in mining were not as high as the Committee indicated. In addition, the Union's data indicated significantly higher returns on capital than did those of the Committee. The Union delegates also drew attention to other estimates of projected mining output that were higher than those used by Committee members. Union delegates opposed the Committee's recommendation for increased tax incentives for the industry. They wanted further consideration of a consultative machinery for translating federal-provincial policy objectives into action but questioned adoption of any policy that urged rapid expansion and exploitation in mining, favouring instead a stronger, more self-sufficient, less growth-oriented industry.

Union delegates noted the low labour content of the substantial exports of crude mineral products and opposed the recommendation for contract arrangements for some foreign workers to enter Canada. They generally supported the Committee's recommendation for improved living standards in remote areas but felt that it did not go far enough.

## Energy

The Energy Committee defined as the prime objective of their industry the development and delivery of energy at a realistically competitive price to meet domestic demand and then to realize export opportunities for the surplus. To avoid an energy crisis in the early 1980s, government policies and decisions were seen to be needed now to encourage resource development at a rate sufficient to ensure continuity in Canadian energy supplies. The Committee thought that special encouragement should be given to

the development of new energy resources and that the pricing mechanism should maintain the incentives necessary to develop the remaining high-cost domestic energy resources in competition with other areas of the world.

The Energy Committee recommended that appropriate consultative procedures be established with both the federal and provincial governments in order to produce guidelines and commitments and to outline administrative requirements in their due jurisdictions. A special Energy Committee, along the lines of the Committee for the Conference, might serve such a purpose.

Since vast amounts of money are to be spent on energy-related projects, there are broad implications for the operations of our financial sector and for the supply and use of materials and manpower. The Committee recommended that when imported capital is needed, preference should be given to foreign-debt rather than foreign-equity capital. Foreign capital should be used where necessary to avoid delays in projects that are economically attractive to Canada or that are required for domestic security reasons. Chapter 5 of this Review explores some possible alternative future patterns of development of energy sources.

### **Chemicals and Chemical Products**

After an extended period of declining performance from 1966 to 1972, a "catching-up" process began in the chemical industry in 1973. Moreover, a period of new opportunities involving major capital expenditures was seen to be at hand, with many projects expected to come to fruition in 1976. However, it was thought that physical supply constraints on capital goods and skilled manpower might reduce the industry's investment program, thus stretching it out over a longer period of time. Meanwhile, the Canadian industry will not be able to keep up with demand in a number of important product lines.

In the judgment of the Chemical Committee, the single most important element that will determine whether Canada achieves economic improvement or experiences discontinuity in economic progress is the way in which the business environment in Canada is managed. In particular, there was seen to be a need for the establishment of industrial priorities, the formulation of a national energy policy, and control of inflation. The Committee thought that guidelines should be developed for the industry within an established overall industrial framework that recognizes the industry's substantial potential for upgrading Canadian resources, especially oil and natural gas. The National Economic Conference approach was cited as one way of moving towards the adoption of industrial guidelines. The chemical industry was especially concerned that current conflicts between



federal and provincial policies be resolved and that uncertainty about the application of the foreign investment review policy be eliminated. Increased access to international markets, with appropriate safeguards for Canadian exports negotiated under GATT, is vital to the stability of certain segments of the industry that seek to achieve world-scale plants. In the light of this, the Committee recommended a revision in the Combines Act to ensure that rationalization schemes, where appropriate, can be effected.

Along with other committees, delegates of the Chemical Committee called for the development of effective programs to upgrade skills of workers and management in order to foster more efficient operations. The Committee also emphasized the importance of improvements in transportation facilities and technology. Members called for a joint effort by industry and carriers to improve bulk shipment and bulk terminals and to make other modifications for handling and shipping materials. The Committee called for a review and a change in both private and public research and development policies.

### **Textiles and Clothing**

Uncertainty in the short term about chemical feedstock supplies was the major concern of the Textiles and Clothing Committee. The longer-term prospects, however, were considered excellent, as both domestic and foreign demand are rising rapidly.

The Committee recommended continuation of, and improvement in, the government textile policy to prevent market disruption by imports. The textile industry is becoming increasingly multinational in its operations, and access to multinational groups contributes to the flow of technology. Government attitudes towards foreign investment and any restrictions of it can have a profound effect on the amount, timing, and direction of expansion within the industry. The Committee called for greater realism in trade negotiations, using fully the strengths of the Canadian position as a major importer of textiles and clothing to gain greater access to foreign markets.

The Committee also endorsed additional efforts to harness the labour potential in depressed areas and provide additional manpower training. However, it added that regional expansion programs must increasingly recognize the importance of scale and rationalization and avoid industry fragmentation and the establishment of small-scale units that have little chance of becoming internationally viable. And, too, as continuity of ownership remains a problem in the clothing industry, the removal of succession duties and the deferment of capital gains taxes on the transfer of ownership would encourage more orderly growth.



## **Metal Fabrication**

Demand for the products of the machinery and metal fabricating sector is highly cyclical. Operating close to capacity in many areas at present, the industry will have difficulty satisfying the demand boom in investment goods, thus necessitating heavier reliance on imports. Investment by the industry itself will be significant. The Committee shared the concern of many of the other committees with the problem of securing sources of energy. It also called for the removal of artificial impediments to efficient operation of labour markets and for increased effort in manpower training in both private and public sectors. It recommended that governments carefully assess the long-term economic viability of industries attracted by various incentives and consider also the impact of such expansion on competing industries in other parts of Canada. The Committee generally agreed with, and supported, the Canadian government's efforts to diversify the nation's trade. At the same time, it strongly recommended that the United States continue to receive the consideration warranted by its stature as Canada's major trading partner and closest neighbour.

## **Construction**

As is evident from the investment intentions implicit in the outlook of the other committees, the construction industry is facing a major surge of demand for industrial and commercial projects, and no significant abatement of the demand for dwellings was anticipated by representatives of the industry. But the industry faces at least two impediments to fulfilling that demand – labour shortages and inflation.

Instability in construction activity is the major impediment to attracting the quality of labour needed in the Canadian construction industry. It is also, in the view of the Committee, at the centre of many labour-management conflicts and the cause of inefficiency in programming and carrying out construction projects. The Committee recommended that financial assistance be made available to underwrite joint study and research into problems of the labour-management groups involved. To minimize at least seasonal instability, it was recommended that research be encouraged on methods of winter construction and that a winter works program be established. Delegates also emphasized that while labour and management are increasingly mobile, local regulations often inhibit mobility. It was thought, therefore, that construction regulations should be co-ordinated nationally.

Inflation is adding a serious complication to the traditional tendering process in construction, necessitating a search for an alternative pricing system for the industry. The Committee suggested that steps be taken to

spread out development as much as possible to minimize the necessity of obtaining conditional financing from outside the country. The Committee also noted that, especially with reference to anticipated large construction projects, clients should consider using consortia of existing firms.

### **Electrical Products**

This industry is looking forward to benefiting from the expected expansion of demand for investment goods. The Electrical Products Committee attached top priority to developing and implementing a set of industrial policies within which manufacturing industries in Canada can operate more competitively, both at home and abroad. The industry sought significant improvement in industry-government working relationships and called for stronger co-ordination of federal and provincial initiatives in industrial development policies.

The Committee was concerned about the steady erosion of market shares because of imports and the vulnerability of the industry to international competition, and it recommended a trade policy that would reflect a balanced approach to negotiations of tariff levels, reduction or elimination of nontariff barriers, modification of international monetary agreements, and support for Canada's electrical-electronics industry. Research and development were singled out for particular attention. Incentive programs, such as PAIT (Program for Assistance to Industrial Technology), IRDIA (Industrial Research and Development Incentive Act), and IRAP (Industrial Research Assistance Program), should be continued, broadened, and modified to recognize the need for a Canadian presence in foreign markets.

### **Transportation Equipment**

With capacity limits being reached in this manufacturing industry, investment requirements are seen as being substantial. Gradual substitution of public for private modes of transportation, especially in urban communities, will entail stepped-up capital outlays by the public sector. Demands on the industry are influenced greatly by government action on general economic conditions, control measures, government planning, research and development, and government aid.

In the area of general economic conditions, the Committee pointed out that policies on exchange rates, trade, inflation, income, and sales and fuel taxes may call for positive action from time to time, to ensure that the industry is able to operate under conditions no less favourable than those

of U.S. and overseas competitors. Control measures, which would significantly worsen export conditions for the industry, should be avoided. Increased energy costs and growth in public transport call for sound planning in the public sector in close co-operation with private industry. Good forward-planning of government requirements for aircraft, ships, and railway rolling stock was called for by the Committee. The Committee also commended recent initiatives by the federal government to involve industry in research and development activities and called for close co-operation with the transportation services and equipment manufacturers in order to develop an industry commensurate with the importance of transportation to Canada. Whenever possible, Canadians should be assisted in developing new transportation systems and equipment for use by Canadian public authorities.

### **Transportation and Communications**

Transportation and communications industries, as important and strategic links in both the economic and social systems, perform vital support functions for the whole of Canadian society and thus are characterized by heavy government regulation. The Committee foresaw that, as in the past, these industries would grow more rapidly than the economy as a whole; Council projections shown in Table 8-4 for the communications industry would therefore appear to be low. The Committee also expected that new developments in equipment and systems would require heavy capital investment at least to 1980. In calling for an integrated national policy, it was recognized that considerable consultation would be essential among all those involved, including the public, industry, and all levels of government.

The Committee recommended that government regulations allow adequate earnings to attract sufficient capital to both the transportation and communications industries to ensure that Canada has world leadership capability in these industries. In addition, a growing need was seen for criteria to measure the need for, and the effectiveness of, subsidized services. The Committee also called for new emphasis on research and development funded by governments and by the private sector. A principal objective is to find new, efficient methods and modes of transportation and transportation systems, especially with a view to efficient use of energy.

Cities figured prominently in the concerns of this Committee. It was recommended that governments increase their investment in the development and implementation of new urban passenger transportation systems and that they encourage the implementation of "noncapital" solutions, such as staggered working hours, to reduce traffic congestion problems.

The Committee further recommended that government and industry cooperate in studying the benefits to be achieved by specialized urban freight distribution terminals.

### **Financial Services**

The Financial Services Committee felt that its main task was to assess the ability of the financial system to provide the funds required by other sectors of the economy. In the judgment of the Committee, inflation will remain a serious problem that will continue to impede the efficient allocation of Canada resources and will distort the deployment of Canadian savings.

Committee members felt that far more information and study is needed on financial relations, financial institutions, and financial flows. A national financial advisory committee, representing all financial institutions in all regions, should, it was thought, work with governments in advance of major policy changes. The Committee further recommended the establishment of an ongoing projection of the flow of funds on an aggregated-industry basis (resources and uses), involving all financial institutions, and a concurrent survey of large capital projects. The Committee welcomed the developing awareness on the part of financial intermediaries (as demonstrated in the work of this Committee) that they are part of the total financial system rather than separate entities.

### **Education**

Educational activities have undergone, and will continue to face, substantial changes. As the bulge in the population moves up through the age groups, there is a declining need for educational services. But, in spite of the trend towards lower school populations, shifts in rural-urban and intracity populations lead to public pressure to locate additional schools close to new population concentrations. It is thought, however, that these schools, in addition to serving the school population, should also provide for the cultural and recreational needs of the surrounding community.

Education is now increasingly recognized as a lifelong process, so that programs and studies must be adapted to meet more widely varying needs, including those of adults seeking self-improvement and new types of knowledge and skills. These changes will require that student assistance schemes accommodate part-time and mature learners and that more flexible working arrangements be negotiated to allow them to participate in the educational system. A number of these matters, especially those concerning the relationship between formal education, manpower training, and the



matching of skills, incentives, motivation, and mobility to personal and community aspirations, are being followed up in greater depth by the Committee on Education and Manpower Training for the 1974 National Economic Conference.

## Health

The amalgam of activities composing health services has only recently been recognized as an "industry." Although the interrelationships of the various components have not yet been adequately studied, the objective is to integrate the numerous subsystems into collaborative or co-operative units for a more effective health system. It was agreed that the main thrust of health services should shift from curative to preventive activities.

Many studies of health services have been recently completed, and the Health Committee recommended that a strategy be developed to implement the recommendations upon which most experts agree. This strategy could evolve in annual conferences of deputy ministers of health from the federal and provincial governments, together with representatives of the major national and provincial associations of health professionals, the public, and voluntary organizations. Committee members also called for the development of a set of socio-medical indicators, based on a decennial National Health Sickness Survey that would be conducted by the Department of Health and Welfare.

The Committee recommended that cost-sharing arrangements between the federal and provincial governments be amended so as to cover all types of care comprehensively, in order to eliminate the distortions in shared-cost services. Among other financial considerations, the Committee recommended that the remuneration of health professionals be linked more closely to an incentive-reward system that would provide strong reasons for the reallocation of tasks to just-qualified personnel.

The Committee identified a need for greatly improved health services in remote areas and recommended that a task force be set up to examine the best method of establishing mobile health centres and clinics in northern communities and isolated areas. Depending on the results achieved, the same concept could be used in low-income urban areas.

## Conclusion

While the assessment of industry prospects by senior decision-makers shows strong links with the macroeconomic developments sketched earlier in this Review, the delegates themselves frequently emphasized not so much the medium-term course they are taking, but the changing,



and often uncertain, rules of the game. This was expressed in their concern about the role of governments in regulating industry and the economy. Thus, depending on the position of the particular spokesman or industry, they were concerned about trade; taxation; manpower; monetary and price policies, especially in the regulated and in the capital-intensive sectors; and about income distribution; social welfare; and other social development policies. The discussion of these concerns often brought forth a recommendation for more systematic and comprehensive mechanisms for consultation among governments, and among government, industry, and other interest groups in society.

All of these assessments, as viewed by the sixteen industry committees and other delegates, were designed to identify points of agreement or disagreement between the outlook that emerged from the Economic Council's analysis and the perceptions of experienced, senior decision-makers in business management, organized labour, governments, and other sectors of society. This comparative, systematic evaluation helped to identify particular opportunities and to focus on possible emerging inconsistencies or on other matters of special concern in one sector or another of the economy or in the economy as a whole. Although no precise matching-up of quantitative evaluations was possible, the wide-ranging perceptions brought together at the Conference, and in the preparations for it, provided indications of the direction and of the approximate magnitude of many of the potential strengths of the Canadian economy, and of a number of constraints that might be expected to act on it. Delegates at the National Economic Conference expressed concern about continuing inflation, manpower availability and use, plant capacity and productivity, and the availability of materials and of energy. Examination of these concerns is to be a central part of the 1974 National Economic Conference.

## **APPENDIXES AND LISTS OF TABLES AND CHARTS**

## APPENDIX A

### *Social Indicators: Supplementary Material*

#### HOUSING INDICATORS

In Chapter 4, we advanced two principal housing indicators at a first-approximation level. In this first section of Appendix A, we explain our choice of these two indicators in more detail and discuss further their distributional aspects.

##### **Measurement of Housing Quality**

The concept of what constitutes housing quality is very complex and not well understood, and it is made even more complicated by the evolving structure of our urban centres and changing life styles. As a consequence, any attempt to measure housing quality presents certain difficult choices. Ideally, measures of housing quality should take account of all relevant structural, physical, locational, environmental, and other characteristics. However, our present knowledge does not permit inclusion of all these factors in one or more composite measures. We have therefore examined the available data in order to select those variables that might best serve as principal indicators for housing quality. Those investigated included the rent (or imputed rent, based on the estimated market value of owner-occupied units) per dwelling or per room, the age of the dwelling, the number of rooms per dwelling, and the number of persons per room.

Each variable had its own strengths and weaknesses. For instance, the rent (or rent imputed from value), from the viewpoint of economic theory, might appear to be the most appropriate variable to capture all the intangible characteristics of the house and its environment. However, it would be difficult to interpret this variable either in an intercity comparison or in temporal analysis, because varying market conditions would be reflected in the rent (or value) level, while quality may not change at all. The age of the dwelling might be an acceptable proxy for

**Table A-1**  
**Elasticities<sup>1</sup> Derived from Regression Results, Owner-Occupied Dwellings, Major Urban Areas,<sup>2</sup> 1971<sup>3</sup>**

Dependent Variable	Variables in Percentage Terms										
	Persons per Household	Average Value on Monthly Basis	Total Household Income <sup>4</sup>	Rooms per Dwelling	Dwellings Built during 1961-71	Households over 65	1961-71 Immigrants in Census Tract <sup>4</sup>	Dwellings with:			
								Public Sewer System Connection	Furnace or Electric Heating	Bath or Shower <sup>5</sup>	R <sup>2</sup>
Persons per room	.834 (56.53)	-.126 (18.92)	-.123 (17.53)		.008 (4.57)	-.015 (5.84)	-.015 (3.84)	-.017 (3.06)	-.093 (8.06)	.008 (.26)	.79
Age of dwelling (per cent built during 1961-71)	2.539 (14.86)	.283 (3.38)	.344 (3.76)	-1.509 (6.05)		-.448 (15.21)	.268 (5.75)	-.458 (6.96)	.488 (3.60)	1.854 (5.40)	.40
Average value on monthly basis	-.589 (13.52)		.356 (16.25)	1.127 (19.12)	.018 (3.38)	.039 (4.98)	.112 (9.62)	-.032 (1.92)	.187 (5.47)	.052 (.59)	.56
Rooms per dwelling	.200 (13.81)	.125 (19.12)	.168 (24.39)		-.011 (6.06)	.021 (7.97)	.015 (3.79)	.020 (3.53)	.074 (6.45)	-.110 (3.79)	.62

<sup>1</sup> The elasticities are calculated at the mean values of the variables. A 1 per cent change in the observed value of the independent variable is associated with an x per cent change in the observed value of the dependent variable, where x is the elasticity value. These elasticity values, being observed at the means, are not necessarily constant over the observed range of values of the variables.

<sup>2</sup> Twenty-three cities that were metropolitan areas or major urban agglomerations in 1971 were employed in these regressions. See Table 4-3.

<sup>3</sup> The level of observation is the census tract. The values in parentheses are the t-statistics (absolute values) from the regressions; a t-statistic, if more than 2.0, suggests that the variable is significant.

<sup>4</sup> Owners and renters were not distinguished in these variables since data were not available.

<sup>5</sup> This refers both to households having these facilities and having exclusive use of them.

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

Table A-2

Elasticities<sup>1</sup> Derived from Regression Results, Renter-Occupied Dwellings, Major Urban Areas,<sup>2</sup> 1971<sup>3</sup>

Dependent Variable	Variables in Percentage Terms											
	Persons per Household	Average Rent on Monthly Basis	Total Household Income <sup>4</sup>	Rooms per Dwelling	Dwellings Built during 1961-71	Households over 65	Dwellings with:					R <sup>2</sup>
							1961-71 Immigrants in Census Tract <sup>4</sup>	Public Sewer System Connection	Furnace or Electric Heating	Bath or Shower <sup>5</sup>		
Persons per room	.523 (55.00)	-.173 (17.05)	-.089 (14.28)		.034 (14.90)	-.010 (4.69)	.021 (5.79)	.079 (13.09)	-.034 (4.64)	.019 (.93)	.77	
Age of dwelling (per cent built during 1961-71)	1.418 (12.02)	1.581 (18.09)	-.010 (.17)	-2.674 (15.64)		-.092 (4.83)	.114 (3.59)	-.195 (3.58)	.435 (6.82)	1.251 (7.02)	.39	
Average gross rent	-.280 (10.37)		.244 (19.60)	.575 (14.76)	.081 (18.08)	-.016 (3.79)	.026 (3.64)	.100 (8.17)	.251 (18.48)	.305 (7.57)	.70	
Rooms per dwelling	.490 (49.74)	.155 (14.76)	.130 (20.07)		-.037 (15.64)	.009 (4.02)	-.019 (5.12)	-.078 (12.57)	.020 (2.66)	.002 (.11)	.75	

1 The elasticities are calculated at the mean values of the variables. A 1 per cent change in the observed value of the independent variable is associated with an  $x$  per cent change in the observed value of the dependent variable, where  $x$  is the elasticity value. These elasticity values, being observed at the means, are not necessarily constant over the observed range of values of the variables.

2 Twenty-three cities that were metropolitan areas or major urban agglomerations in 1971 were employed in these regressions. See Table 4-3.

3 The level of observation is the census tract. The values in parentheses are the  $t$ -statistics (absolute values) from the regressions; a  $t$ -statistic, if more than 2.0, suggests that the variable is significant.

4 Owners and renters were not distinguished in these variables since data were not available.

5 This refers both to households having these facilities and having exclusive use of them.

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.



quality if we were to assume that housing is a homogeneous good and that it deteriorates evenly over time. However, this ignores, for example, basic structural quality and maintenance activity. Another possibility for consideration is dwelling size. Data on this variable are available in terms of the number of rooms in a dwelling although not, unfortunately, in terms of square-footage. However, the size of a dwelling may be misleading as a measure of housing adequacy, since we cannot say that a small dwelling is less adequate than a large dwelling without knowing the number of occupants.

A variable that seems to avoid many of these problems is a measure of crowding – that is, the number of persons per room. However, before choosing one variable over another as a proxy measure of housing quality, we tested a number of them, employing both regression analysis and factor analysis.<sup>1</sup> The regression results for the variables discussed above (others were also tested) for owner-occupied and rented dwellings are summarized in Tables A-1 and A-2, respectively. Our choice of a crowding index – that is, the number of persons per room – as an appropriate first-approximation housing quality indicator is based both on the conceptual considerations discussed above and the results of our analyses. Not only is crowding an important aspect of housing quality in itself, but it is also significantly associated with other related factors.

Tables A-1 and A-2 also point out certain differences between the two types of tenure. For instance, the elasticity values indicate that gross rent (or value) has a greater impact on the number of persons per room within renter-occupied dwellings than within owner-occupied dwellings. In other words, the costs associated with marginal improvements in the tenants' crowding index tend to be larger than the costs associated with the same improvements for homeowners.

As a second indicator, we considered using the ratio of rent (or rent imputed from value)<sup>2</sup> to income, a criterion often used by financial institutions in defining an acceptance threshold for mortgage loans. However, this could be misleading as a measure related to quality without some consideration of the space dimension, since the portion of income spent on housing tells us nothing about the size of what is being purchased or rented. We thus decided to use rent (or value) per room as a percentage of total household income; in essence, this is a measure of the cost of housing quality in relation to the ability to pay. This indicator clearly complements the crowding indicator, as each additional

1 The results of the factor analysis are not presented here; they will be presented in a Discussion Paper by Trinh Minh Anh, "Les indicateurs de logement et la structure urbaine," Economic Council of Canada (forthcoming).

2 In the case of owner-occupied dwellings, rent per month was imputed by taking 1 per cent of value.

room for a household decreases crowding and thereby increases housing quality. Both income and costs per room place certain constraints on the ability to purchase housing quality, and this indicator shows the extent to which these constraints are diminishing over time.

### **Additional Distributional Information**

Table A-3 shows the distribution of crowding, by certain socio-economic characteristics, for selected metropolitan areas in 1961 and 1971. The disparity between the crowding index for the lower- and higher-income households was generally greater in 1961 than in 1971. For the other socio-economic characteristics in Table A-3, the distribution of crowding in most cities generally followed the pattern of the aggregate figures for the twenty-three selected major urban areas for both 1961 and 1971 (Table 4-6). However, there were some variations in the distribution pattern of the crowding index across cities for particular socio-economic characteristics.

In Chapter 4 (Table 4-8), the distribution of the indicator of the cost of housing quality relative to the ability to pay is shown with respect to several socio-economic characteristics for the major urban areas as a whole in 1961 and 1971. Table A-4 shows the distribution of this indicator for the same socio-economic characteristics in ten selected metropolitan areas during the same years. Two particular points of interest stand out in this table. First, in Montreal and Quebec in particular, the value of the indicator in 1961 was higher for higher-income households than for lower-income households, whereas the reverse was true for most of the other cities. In 1971, however, the indicator decreased with increasing household income for all ten metropolitan areas. In other words, the shift in the distribution of this indicator with respect to income over the 1961-71 period was particularly dramatic for both Montreal and Quebec.

Second, in 1961 the value of the indicator decreased with age of dwelling in Montreal, Quebec, and Halifax, and increased with age of dwelling in Calgary and Edmonton; for the other five cities, the variations were relatively smaller. In 1971, however, there was comparatively less overall variation of the indicator with age of dwelling for the ten metropolitan areas than in 1961 (in Montreal, Quebec, and Halifax, for instance, there was very little difference in 1971). This change in relationship over the decade appears to indicate a decline in the importance of age of dwelling as a factor in the cost of housing in certain major urban areas. A household at a given level of income in 1971 did not place a premium on either older or newer dwellings; consequently, the working of the housing market has eliminated the cost differentials.

Table A-3  
Crowding Index, by Socio-Economic Characteristic, for Selected Metropolitan Areas, Canada, 1961 and 1971

	Halifax		Quebec		Montreal		Ottawa-Hull		Toronto		Hamilton		Winnipeg		Calgary		Edmonton		Vancouver	
	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971
(Persons per room)																				
Average	.79	.67	.81	.70	.77	.68	.74	.63	.67	.60	.68	.60	.73	.62	.70	.58	.74	.62	.66	.58
Total household income <sup>1</sup>																				
Lowest quintile	*	*	.72	.79	.58	*	*	*	.87	.65	*	.59	*	*	*	.50	*	.49	*	*
Second quintile	.98	.78	.83	.72	.82	.70	.93	.68	.71	.65	.72	.61	.77	.57	.63	.53	.74	.60	.70	.58
Middle quintile	.85	.70	.85	.75	.82	.72	.77	.66	.70	.62	.71	.62	.75	.64	.72	.60	.77	.62	.69	.60
Fourth quintile	.75	.62	.77	.68	.72	.65	.70	.60	.63	.58	.65	.60	.71	.64	.70	.61	.71	.65	.63	.58
Highest quintile	.56	.55	.63	.57	.56	.51	.60	.54	.52	.48	.58	.51	.59	.46	.63	.53	.59	.52	.54	.48
Rent (or value) per month (\$1961) <sup>1</sup>																				
\$50 or less	.98	*	.79	.77	.76	.68	.78	*	.76	*	.88	*	.79	*	.83	*	.83	*	.63	*
\$51 to \$100	.92	.77	.85	.73	.86	.72	.90	.75	.78	.65	.70	.51	.76	.60	.71	.53	.77	.56	.72	.59
\$101 to \$200	.75	.68	.74	.70	.74	.66	.71	.64	.68	.62	.68	.61	.71	.63	.70	.60	.73	.63	.66	.59
\$201 or more	.54	.55	.60	.55	.53	.48	.58	.56	.55	.56	.54	.58	.57	.51	.54	.56	.58	.55	.53	.52
Persons per household <sup>1</sup>																				
2 or less	*	*	.66	.56	.62	.54	.52	.47	.55	.51	.56	.49	.64	.49	.61	.49	.68	.51	.56	.51
2.1 to 3.0	.64	.57	.60	.60	.65	.63	.61	.56	.58	.54	.58	.56	.64	.59	.60	.53	.64	.56	.60	.56
3.1 to 4.0	.70	.69	.71	.72	.73	.70	.66	.66	.64	.62	.66	.63	.70	.65	.68	.63	.70	.64	.67	.60
4.1 to 6.0	.85	.84	.83	.82	.83	.71	.82	.77	.73	.73	.76	.62	.80	*	.77	.63	.79	.71	.72	.92
6.1 or more	1.33	*	*	*	1.00	*	*	*	.93	*	*	*	.83	*	*	*	*	*	1.20	*

Table A-3 (concl'd.)

	Halifax		Quebec		Montreal		Ottawa-Hull		Toronto		Hamilton		Winnipeg		Calgary		Edmonton		Vancouver	
	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971
(Persons per room)																				
Age of dwelling <sup>2,3</sup>																				
Built before 1920 (1946)	.79	.64	.79	.69	.76	.66	.72	.60	.70	.59	.66	.59	.72	.58	.65	.54	.70	.58	.66	.57
Built during 1920-45 (1946-60)	.77	.68	.79	.70	.74	.68	.71	.64	.63	.60	.65	.62	.71	.63	.66	.59	.71	.61	.64	.58
Built during 1946-59 (1960-68)	.80	.69	.81	.72	.78	.68	.77	.63	.67	.61	.70	.62	.74	.65	.71	.60	.75	.63	.67	.58
Built during 1960-61 (1969-71)	.80	.69	.82	.74	.79	.69	.73	.66	.66	.61	.68	.61	.76	.66	.72	.60	.79	.64	.68	.60
Age of head of household <sup>2</sup>																				
65 or over	.76	.64	.77	.68	.73	.64	.69	.59	.64	.57	.66	.59	.71	.59	.66	.55	.70	.58	.64	.57
Under 65	.79	.67	.80	.71	.77	.68	.74	.63	.67	.60	.68	.61	.73	.62	.70	.59	.74	.62	.66	.58

\*Insufficient number of observations, or not available.

1 A characteristic is disaggregated according to the weighted average value (income, rent, or persons per household) of each census tract for 1971 and each enumeration area for 1961 (except for total household income for the major urban areas in 1961 where the level of observation is the census tract).

2 The value for each category is determined through the use of weights made up of the number of relevant households in each census tract (in 1971) or enumeration area (in 1961) as a proportion of all relevant households in the category.

3 The time periods not in parentheses refer to 1961 data; those in parentheses, to 1971 data.

SOURCE Statistics Canada, 1961 and 1971 Censuses; and estimates by the Economic Council of Canada.

Table A-4

Rent (or Value) per Room as a Percentage of Total Household Income, by Socio-Economic Characteristic, for Selected Metropolitan Areas, Canada, 1961 and 1971

[illegible]



Table A-4 (concl'd.)

	Halifax		Quebec		Montreal		Ottawa-Hull		Toronto		Hamilton		Winnipeg		Calgary		Edmonton		Vancouver	
	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971	1961	1971
Age of dwelling <sup>2,3</sup>																				
Built before 1920 (1946)	4.0	4.2	2.1	3.7	1.2	3.8	3.7	4.0	4.0	4.6	4.1	4.3	4.0	3.9	5.0	4.6	4.9	4.7	4.9	5.2
Built during 1920-45 (1946-60)	4.2	4.1	2.5	3.5	1.9	3.8	3.7	3.7	4.1	4.5	4.0	4.4	4.1	3.8	4.7	3.8	4.6	3.9	4.6	5.0
Built during 1946-59 (1960-68)	4.3	4.2	3.4	3.6	3.0	3.8	4.0	3.7	4.0	4.5	4.2	4.4	4.2	4.0	4.3	3.8	4.1	4.2	4.9	5.3
Built during 1960-61 (1969-71)	4.5	4.2	3.7	3.6	3.3	3.7	4.0	3.7	3.8	4.5	4.0	4.5	4.2	4.2	4.0	4.1	4.5	4.4	4.9	5.3
Age of head of household <sup>2</sup>																				
65 or over	4.1	4.1	2.5	3.6	2.0	3.8	3.7	3.8	4.0	4.6	4.1	4.4	4.0	4.0	4.8	4.3	4.5	4.4	4.8	5.4
Under 65	4.2	4.1	2.9	3.6	2.4	3.8	3.9	3.8	4.0	4.5	4.1	4.3	4.1	3.9	4.5	4.0	4.3	4.1	4.8	5.1

\*Insufficient number of observations, or not available.

1 A characteristic is disaggregated according to the weighted average value (income, rent, or persons per household) of each census tract for 1961 and 1971.

2 The value for each category is determined through the use of weights made up of the number of relevant households in each census tract as a proportion of all relevant households in the category.

3 The time periods not in parentheses refer to 1961 data; those in parentheses, to 1971 data.

SOURCE Statistics Canada, 1961 and 1971 Censuses; and estimates by the Economic Council of Canada.

## HEALTH INDICATORS

The principal health indicators proposed on a first-approximation basis in Chapter 4 – on which supplementary material is presented here – touch on three mortality-related facets of health: life expectancy, infant mortality, and prime-age mortality. In each case, accidental and violent deaths are excluded from consideration. Since the assumption that these three facets represent the key aspects of mortality is inherent in their selection, their particular choice deserves a brief discussion.

Length of life is certainly of fundamental concern to society. It provides a general reference point with respect to the effect of certain factors, at various stages of the life cycle, on the longevity of individuals; for example, the effect on life expectancy of the mortality rate of a particular age group or of certain types of mortality can be discerned. In short, it is a base measure to which other aspects of mortality can be related.

Infant and prime-age mortality are more specific in that they cover two vital periods of the life cycle. The incidence of death among children aged less than one year is unquestionably important, since it is higher than for any other age group under sixty years of age. For this and other reasons (such as the effects on the well-being of the family), infant mortality has been singled out for particular attention.

The mortality rate attributed to disease is relatively low after the first year of life up until the time people reach their mid-thirties. Thereafter, however, the mortality rate begins to rise significantly, with the major causes of death being circulatory diseases and cancer and related diseases. In looking at prime-age mortality, we have therefore focused on the 35-64 age group. People in this group tend to be more active in our economy and society than those of a more advanced age and are more subject to serious diseases than those in the 1-34 age group. As a result, we have given more weight to mortality in the 35-64 age group than to the incidence or causes of death among children over one, adolescents, younger adults, or those over 65. Nevertheless, the causes of death after 65 should be recognized as an important and relevant concern in their own right, although examination of them is complex because deaths of older individuals are often the result of a combination of factors not always clearly recorded.

### Life Expectancy

Table A-5 presents life expectancy (excluding accidental and violent deaths except suicide) of males and females in Canada at birth, one year, forty years, and sixty years, over the 1931-71 period. The latter three life expectancies were proposed in Chapter 4 as supplementary indicators of life expectancy at birth.

Table A-5

Life Expectancy (Excluding Accidental and Violent Deaths except Suicide), by Age and Sex, Canada,<sup>1</sup> 1931-71

	1931	1941	1951	1956	1961	1966	1971
Males	61.8 (1.8) <sup>2</sup>	64.8 (1.8)	68.2 (1.9)	(At birth) 69.5 (1.9)	70.2 (1.8)	70.8 (2.0)	71.4 (2.0)
Females	62.7 (0.6)	66.9 (0.6)	71.5 (0.7)	73.6 (0.7)	74.9 (0.7)	76.0 (0.8)	77.3 (0.9)
Males	66.5 (1.8)	68.0 (1.9)	70.2 (1.9)	(One year old) 70.9 (1.9)	71.3 (1.8)	71.5 (2.0)	71.7 (2.0)
Females	66.3 (0.6)	69.3 (0.6)	72.9 (0.6)	74.6 (0.6)	75.6 (0.6)	76.5 (0.8)	77.4 (0.8)
Males	32.6 (0.6)	32.5 (0.6)	33.0 (0.5)	(40 years old) 33.3 (0.6)	33.5 (0.5)	33.6 (0.6)	33.8 (0.6)
Females	33.3 (0.3)	34.2 (0.2)	35.9 (0.3)	36.9 (0.2)	37.7 (0.2)	38.4 (0.2)	39.3 (0.3)
Males	16.5 (0.2)	16.3 (0.2)	16.7 (0.2)	(60 years old) 16.8 (0.3)	16.9 (0.2)	17.0 (0.2)	17.2 (0.2)
Females	17.3 (0.1)	17.9 (0.3)	18.8 (0.2)	19.5 (0.2)	20.1 (0.2)	20.7 (0.1)	21.6 (0.2)

1 Excluding Newfoundland in 1931 and 1941.

2 The figures in parentheses represent the effect of accidental and violent deaths on life expectancy at birth. Subtracting the figures in parentheses from the figures to their left gives life expectancy at birth, taking all causes of death into account - that is, the life expectancy figures usually presented.

SOURCE Based on data from Statistics Canada, and material prepared for the Economic Council of Canada by Y. Péron, Department of Demography, University of Montreal.

From Table A-6 it can be seen that a major part of the increase in life expectancy at birth between 1931 and 1971 is the result of factors other than the decrease in the infant mortality rate. Although the decrease in this rate was responsible for a significant proportion of the increase in the life expectancy of males at birth over this period (roughly two-fifths), the effect of the decrease in the infant mortality rate had a much smaller impact on the increase in the life expectancy of females at birth. This table also indicates that the life expectancy of males of forty and over has changed very little over these four decades, whereas that for females of forty and over has shown a considerably larger increase.

Table A-6

**Increase in Life Expectancy (Excluding Accidental and Violent Deaths except Suicide), by Age and Sex, between 1931 and 1971**

	At Birth	At 1 Year	At 40 Years	At 60 Years
	(Years)			
Males	9.6	5.2	1.2	0.7
Females	14.6	11.1	6.0	4.3

SOURCE Table A-5.

In Chapter 4, the difference in participation rates between men and women in the medical care insurance plans was discussed for three provinces. In addition, however, it appears that women not only participate more than men during the critical middle years but, taking into account all age groups, they also use more services per participant than men. For example, a study done on Quebec for one year (1971-72) showed that the women of all ages who participated in the Quebec Health Insurance program consumed 28 per cent more services, on average, than the participating men. During that year, 56 per cent of the surgical work and 65 per cent of the diagnostic and therapeutic work was performed on women; in addition, 59 per cent of the visits, 60 per cent of the consultations,<sup>3</sup> and 60 per cent of the other services were accounted for by women. Furthermore, 60 per cent of the amount spent for services covered by the program is attributable to women.<sup>4</sup>

3 Visits differ from consultations in that the latter are more complete medical examinations and, in the great majority of cases, are carried out by specialists at the request of another doctor for the purpose of assisting in the determination of proper diagnosis.

4 Marcel Rodrigue, *Use of Physicians in a National Medical Care Plan: The Quebec Experience — Fiscal Year 1971-72*, Health and Welfare Canada (forthcoming). Infants and the aged are underrepresented in the sample upon which this study is based.

Other information available indicates that this general pattern holds elsewhere. There is also evidence that, for the 35-64 age group, women use more services per participant than men, even when services associated with physiological differences are not included. One of the reasons women live longer than men may then simply be that they generally look after themselves better from a medical standpoint, and they do so particularly during a critical period of their lives.

### Infant Mortality

Table A-7 shows the changes in the relative importance of the major causes of infant mortality over the 1951-72 period. "Certain causes of perinatal mortality" remained the most important and increased in significance over the period. Congenital anomalies also increased in relative importance over the period, becoming the second-ranked cause in 1972. The other causes all decreased in relative importance.

The infant mortality rate for 1985 (excluding accidental and violent deaths) was reached by projecting each of the rates of the categories in Table A-7 by sex and summing these rates for each sex for a given year.<sup>5</sup> The results for the two sexes were then combined for each year, taking account of the observed male-female ratio for live births, to give the infant mortality rates that might be expected if the past trends were to continue. The projections are shown in Table A-8 for certain years.

As discussed in Chapter 4, we attempted to determine whether changes in certain demographic factors were associated with the decrease in the rates of infant, neo-natal, and post-neo-natal mortality experienced in Canada since 1949. Several variables suggested by the literature were tested: 1/the proportion of mothers of newborn infants who are 35 or older; 2/the proportion of mothers who are less than 20 years old; 3/the proportion of fathers of legitimate newborn infants who are 45 or older; 4/the proportion of live births to mothers having had at least five previous live births; 5/the number of infants born live in multiple births as a percentage of all live births; and proxy variables for 6/the proportion of live births to mothers who have had stillbirths, and for 7/the proportion of live births to mothers who have had infants who died during the neo-natal period. Analyses involving several approaches reveal that only changes in the sixth variable are significantly associated with changes in the infant and post-neo-natal mortality rates. Thus, as noted in Chapter 4, demographic factors do not appear to play an important role in explaining the decreasing infant mortality rate, at least at this level of aggregation.

5 All projections are semilogarithmic except for "certain causes of perinatal mortality" and "congenital anomalies," which were projected linearly.



**Table A-7**  
**Relative Importance of Selected Causes of Infant Mortality (Excluding Accidental and Violent Deaths)**  
**Canada,<sup>1</sup> 1951-72**

	Infective and Parasitic Diseases	Endocrine, Nutritional, and Metabolic, and Blood Diseases	Diseases of the Nervous System and Sense Organs	Diseases of the Respiratory System	Congenital Anomalies	Certain Causes of Perinatal Mortality	Diseases of the Digestive System	Other	Total <sup>2</sup>
	(Per cent)								
1951	9.6	2.3	2.8	19.3	14.7	45.3	1.9	4.2	100
1954	7.6	1.8	3.1	18.9	16.1	47.6	1.6	3.3	100
1957	6.4	1.4	2.0	18.4	16.5	50.7	1.5	3.2	100
1960	6.4	1.5	2.0	18.0	17.0	51.5	1.6	2.0	100
1963	5.0	1.0	1.8	15.0	18.2	55.7	1.5	1.8	100
1966	3.8	1.1	2.2	13.1	20.7	56.5	1.6	1.0	100
1969	2.4	1.1	1.8	10.9	21.5	59.6	1.5	1.1	100
1972	3.4	1.1	1.6	10.7	23.6	56.8	1.7	1.1	100

1 Including Yukon and Northwest Territories.

2 Because figures have been rounded, their sums do not necessarily equal 100.

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

**Table A-8**  
**Projected Infant Mortality Rates**  
**(Excluding Accidental and Violent Deaths), by Sex, 1973-85**

	1973	1975	1977	1979	1981	1983	1985
	(Per 100,000 live births)						
Total	1,646	1,529	1,419	1,312	1,209	1,110	1,014
Male	1,835	1,704	1,578	1,458	1,342	1,230	1,122
Female	1,446	1,344	1,248	1,156	1,068	983	900

SOURCE Estimates by the Economic Council of Canada.

### AN ENVIRONMENTAL INDICATOR

The following supplementary material is divided into three sections: the first touches briefly on the existing situation with respect to the measurement of urban ambient air quality in Canada; the second presents more detailed information on the way in which the urban air quality indicator is formulated; and the third outlines briefly the existing emission inventory activity.

#### Ambient Air Quality Monitoring

The federal-provincial "National Air Pollution Surveillance Program" provides for the collection and dissemination of data on airborne pollutants in urban areas. As of June 1974, forty cities were being monitored, twenty-seven of them since 1970. The pollutants monitored up to 1973 were particulate matter (airborne solids) and the sulphur oxides.<sup>6</sup> Pre-occupation with these two pollutants probably stems from past experiences (notably in the United States and Europe rather than in Canada), when the inefficient burning of coal resulted in visibly filthy air and the odours of sulphur compounds, and when pollution "disasters" leading to increased mortality (e.g., the London "fog" of 1952) were accompanied by these signs of air pollution. However, particulate matter and sulphur oxides are probably not the most important pollutants, and the national

6 Particulate matter was measured by dustfall, coefficient of haze (soiling index), and suspended particulates (with analysis to determine the lead content in some cases); the sulphur oxides were measured by the sulphation rate and sulphur dioxides.

program is being expanded to monitor other pollutants in at least a few urban areas.<sup>7</sup>

Several provinces have separate monitoring networks; Alberta, Ontario, and Quebec, in particular, collect data on a number of pollutants. In addition, the Montreal Urban Community operates a network of stations that monitor a wide range of potentially harmful pollutants. Because there is good reason to believe that particulate matter and sulphur oxides are not, collectively, an adequate proxy for the whole complex of pollutants, the data employed in the computation of our urban air quality indicator are derived from provincial and municipal sources.

### **The Urban Air Quality Indicator**

The urban air quality indicator is made up of three basic components: the concentrations of certain pollutants in ambient air, the relative severity factors for these pollutants, and the population at risk.

The concentration of the pollutants considered – total oxidants, the nitrogen oxides, carbon monoxide, sulphur dioxide, and particulate matter – are measured in parts per million (ppm) or are converted to an equivalent basis through the use of the relative severity factors. They are measured on an hourly basis; these measurements are then summed over the year and divided by the number of hours for which there are readings, to obtain an hourly based annual average concentration.

Hydrocarbons are not included among the pollutants used to construct the urban air quality indicator, although data on hydrocarbon concentration in ambient air are widely collected by some provincial monitoring systems. They represent a rather heterogeneous group, including carcinogenic agents and precursors of photochemical smog, and no overall criteria have been established for them, partially because data on the proportion of the various types of hydrocarbons within the total hydrocarbon mix are not generally available. However, since the major impact of hydrocarbons on the environment is believed to be through their contribution to oxidant formation, their effect on human health and well-being is assumed to be captured, in large part, by the data on total oxidants.

The relative severity factors employed are derived from the 24-hour air quality criteria of the Ontario Ministry of the Environment, and they represent the relative environmental impact of the five pollutants at the

7 Apparently, data on carbon monoxide, hydrocarbons, nitrogen dioxide, and ozone for some urban centres will be published in the NAPS Program monthly bulletin for January 1973 (not yet available).

same concentration.<sup>8</sup> Table A-9 shows both the criteria and the relative severity factors, the latter being obtained by dividing the carbon monoxide concentration at criterion by the concentration at criterion of each pollutant. If the one-hour criteria of the Ontario Ministry of the Environment were used, the relative severity factors would be: total oxidants, 400; nitrogen oxides, 200; sulphur dioxides, 160; particulate matter, 16 (estimated); and carbon monoxide, 1. The differences between the severity factors based on the 24-hour and one-hour criteria simply indicate that the relative effects of the pollutants on the environment, at the same level of concentration, vary with the time period being considered.

**Table A-9**  
**Relative Severity Factors**

	Units of Measure	Time Period Base for Criteria	Concen- tration <sup>1</sup> at Criterion	Relative Severity Factor
Carbon monoxide	Parts per million (volume) <sup>2</sup>	24 hours	8.00	1
Nitrogen oxides	Parts per million (volume) <sup>2</sup>	24 hours	0.10	80
Total oxidants	Parts per million (volume) <sup>2</sup>	24 hours	0.03	267
Sulphur dioxide	Parts per million (volume) <sup>2</sup>	24 hours	0.10	80
Particulate matter	Coefficient of haze per 1,000 feet of air	24 hours	1.00	8

1 Ontario Ministry of the Environment, *Air Quality Monitoring Report, Ontario 1971*, vol. 1, 1971, Table 2.

2 The concentration of the pollutant is measured by its proportional volume in air. For instance, 1 ppm of carbon monoxide represents one volume of carbon monoxide for every million volumes of ambient air.

SOURCE Ontario Ministry of the Environment, and estimates by the Economic Council of Canada.

The relative severity factors employed in constructing the urban air quality indicator are essentially consistent with our analytical findings about the effect of these pollutants on respiratory diseases. The analyses

8 Over the range of pollutant concentrations in ambient urban air, it is assumed that the negative effects on the environment are proportional to concentration. At higher levels, however, there is some reason to believe that the negative effect increases at a faster rate than does the concentration.

for two cities for which the appropriate detailed data exist – Windsor and Edmonton in 1972 – suggest that the relative severity factor for total oxidants may be understated. The analyses compared the average weekly concentration of the various pollutants (measured on an hourly basis) and the average weekly hospital admissions for respiratory ailments (lagged by one day) among the more vulnerable age groups (under 15 and over 45), also taking other factors into account. A strong correlation was found for total oxidants in both Windsor and Edmonton, and there was a significant correlation for nitrogen oxides in Windsor (even though the criterion for nitrogen oxides was seldom exceeded in Windsor in 1972, the average hourly concentration was moderately high). Additionally, a significant correlation between sulphur-dioxide/particulate-matter and certain respiratory ailments (particularly bronchitis) was found in Windsor (Edmonton has very little sulphur dioxide).

The relative severity factors and the observed pollutant concentrations are used to calculate the urban air quality indicator in the following manner. The multiplication of the severity factor for a pollutant, the average hourly concentration of the pollutant in ambient air (in ppm), and the population at risk gives the number of impact units for this pollutant in a particular city. The number of impact units for each pollutant in each city is shown in Tables A-10, A-11, and A-12 for 1971, 1972, and 1973, respectively. These are summed horizontally to give the total number of impact units for each city; if put on a per capita basis, they provide a comparable “pollution index” for each city. When they are summed vertically, the total number of impact units for each pollutant is obtained across all eleven cities, and these are referred to as “urban pollutant subindicators.” The sum of these subindicators for each pollutant gives the overall “urban air quality indicator.” This indicator is also expressed in per capita terms (the bottom line of the table). The first reflects the impact on society; the second, the impact on individuals.

In the formulation of this indicator, certain estimates had to be made. The concentration of nitrogen oxides was sometimes estimated on the basis of a combination of data on nitrogen dioxide and nitrogen oxides; and, in a few cases, total oxidant concentration was based on the concentration of ozone, which normally accounts for about 80 to 90 per cent of total oxidants. Of the 165 annual hourly based average observations (eleven cities for three years and five pollutants), 12 had to be estimated from other years for which data exist. Also, in a few instances, citywide ambient air concentrations were obtained from a limited number of observation sites. These estimates may create certain imprecisions in the calculation of the urban air quality indicator, although the overall pattern is rather insensitive to minor variations in the values of the ambient air concentration of particular pollutants.



Table A-10  
Urban Air Quality Indicator, 1971

	Population	Total Oxidants	Nitrogen Oxides	Carbon Monoxide	Sulphur Dioxide <sup>2</sup>	Particulate Matter	Synergism <sup>3</sup>	Total Impact Units by City	City Pollution Index	Urban Rank
					(Thousands)				(Impact units per capita)	(1 = Best 11 = Worst)
Relative severity factor		267	80	1	80	8	—	—	—	—
Edmonton	495.70	2,779	1,110	793	79	753	79	5,593	11.3	1
Calgary	403.32	646	1,613	1,492	129	742	129	4,751	11.8	2
Ottawa-Hull	602.51	3,057	1,687	964	482	1,301	482	7,973	13.2	3
London	286.01	1,756	755	458	343	549	343	4,204	14.7	4
Sudbury	155.42	871	224	187	622	298	298	2,500	16.1	5
Toronto	2,628.04	7,017	13,035	12,089	5,677	7,148	5,677	50,643	19.3	6
Cornwall	47.12	403	94	75	155	98	98	923	19.6	7
Sarnia	57.64	508	115	202	120	157	120	1,222	21.2	8
Montreal	2,743.21	14,649	3,072	19,202	7,681	16,898	7,681	69,183	25.2	9
Hamilton	498.52	5,590	2,034	1,745	838	1,595	838	12,640	25.4	10
Windsor	258.64	1,934	993	1,552	600	1,159	600	6,838	26.4	11
Total	8,176.13	39,210	24,732	38,759	16,726	30,698	16,345	166,470		
Urban pollutant subindicators (millions of impact units)		39.2	24.7	38.8	16.7	30.7	16.3			
Urban air quality indicator (millions of impact units)					166.5					
Per capita urban air quality indicator (impact units per capita)					20.4					

1 "Impact units" are defined as: (relative severity factor) x (pollutant concentration in ppm) x (population).

2 Sulphur oxides are converted to sulphur dioxide equivalents.

3 The impact of synergism is considered equivalent to the lower of the impacts for sulphur dioxide and particulate matter.

SOURCE Alberta Department of the Environment; Quebec Environmental Protection Service; Ontario Ministry of the Environment; Montreal Urban Community; Statistics Canada; and estimates by the Economic Council of Canada.

Table A-11  
Urban Air Quality Indicator, 1972

Relative severity factor	Population	Total Oxidants	Nitrogen Oxides	Carbon Monoxide	Sulphur Dioxide <sup>2</sup>	Particulate Matter	Synergism <sup>3</sup>	Impact Units <sup>1</sup>		
								Total Impact Units by City	City Pollution Index	Urban Rank
								(Thousands)	(Impact units per capita)	(1 = Best 11 = Worst)
		267	80	1	80	8	—	—	—	—
Edmonton	507.00	1,218	1,298	710	81	771	81	4,159	8.2	1
Calgary	417.00	668	1,268	1,126	133	534	133	3,862	9.3	2
Ottawa-Hull	613.00	5,074	1,814	674	1,275	1,324	1,275	11,436	18.7	7
London	290.00	1,394	603	551	139	394	139	3,220	11.1	3
Sudbury	157.00	1,461	289	283	427	151	151	1,762	11.2	4
Toronto	2,672.00	5,707	13,467	9,619	4,061	7,054	4,061	43,969	16.5	5
Cornwall	47.81	587	65	48	80	92	80	952	19.9	8
Sarnia	58.45	437	84	152	94	173	94	1,034	17.7	6
Montreal	2,761.00	14,744	3,092	13,805	7,510	16,124	7,510	62,785	22.7	11
Hamilton	505.00	4,180	1,939	1,162	566	1,818	566	10,231	20.3	9
Windsor	262.00	1,469	461	1,258	650	859	650	5,347	20.4	10
Total	8,290.26	35,939	24,380	29,388	15,016	29,294	14,740	148,757		
Urban pollutant subindicators (millions of impact units)		35.9	24.4	29.4	15.0	29.3	14.7			
Urban air quality indicator (millions of impact units)					148.8					
Per capita urban air quality indicator (impact units per capita)					17.9					

1 "Impact units" are defined as: (relative severity factor) x (pollutant concentration in ppm) x (population).

2 Sulphur oxides are converted to sulphur dioxide equivalents.

3 The impact of synergism is considered equivalent to the lower of the impacts for sulphur dioxide and particulate matter.

SOURCE Alberta Department of the Environment; Quebec Environmental Protection Service; Ontario Ministry of the Environment; Montreal Urban Community; Statistics Canada; and estimates by the Economic Council of Canada.

Table A-12

## Urban Air Quality Indicator, 1973

Relative severity factor	Impact Units <sup>1</sup>								City Pollution Index	Urban Rank
	Population	Total Oxidants	Nitrogen Oxides	Carbon Monoxide	Sulphur Dioxide <sup>2</sup>	Particulate Matter	Synergism <sup>3</sup>	Total Impact Units by City		
					(Thousands)				(Impact units per capita)	(1 = Best 11 = Worst)
267			80	1	80	8	—	—	—	—
Edmonton	518.00	968	2,652	932	83	539	83	5,257	10.1	3
Calgary	431.00	921	1,827	1,767	138	621	138	5,412	12.6	6
Ottawa-Hull	619.00	2,810	1,832	867	495	941	495	7,440	12.0	5
London	293.00	1,252	609	586	117	352	117	3,033	10.4	4
Sudbury	155.00	166	124	248	285	112	112	1,047	6.7	1
Toronto	2,692.00	7,906	12,491	9,691	3,230	6,892	3,230	43,440	16.1	7
Cornwall	48.51	194	47	39	50	85	50	465	9.6	2
Sarnia	59.27	411	81	166	85	133	85	961	16.2	8
Montreal	2,775.00	14,819	4,884	16,650	5,994	13,764	5,994	62,105	22.4	11
Hamilton	513.00	4,109	1,847	1,077	616	1,642	616	9,907	19.3	9
Windsor	264.00	1,339	718	1,241	570	824	570	5,262	19.9	10
Total	8,367.78	34,895	27,112	33,264	11,663	25,905	11,490	144,329		
Urban pollutant subindicators (millions of impact units)		34.9	27.1	33.3	11.7	25.9	11.5			
Urban air quality indicator (millions of impact units)					144.3					
Per capita urban air quality indicator (impact units per capita)					17.2					

1 "Impact units" are defined as: (relative severity factor) x (pollutant concentration in ppm) x (population).

2 Sulphur oxides are converted to sulphur dioxide equivalents.

3 The impact of synergism is considered equivalent to the lower of the impacts for sulphur dioxide and particulate matter.

SOURCE Alberta Department of the Environment; Quebec Environmental Protection Service; Ontario Ministry of the Environment; Montreal Urban Community; Statistics Canada, and estimates by the Economic Council of Canada.

One further caveat should be noted. Very little is known about the synergistic or neutralizing effects of airborne pollutants on the environment in general, and on human health and well-being in particular. Much more will have to be learned about these interactions, as well as the actual individual effects of pollutants, before a more firmly based set of relative severity factors can be adopted.

### Emission Inventories

A number of efforts are being made to establish emission inventories, by pollutant and source, across Canada. Several provincial governments have commissioned studies on the emission of pollutants. For example, the B.C. Research Council has compiled a provincewide inventory of pollutant sources and emissions, which generally can be allocated to specific urban centres.<sup>9</sup> In Alberta, inventories have recently been conducted for both Edmonton and Calgary; in Saskatchewan, for Regina and Saskatoon. Further, the Ontario Ministry of the Environment has compiled inventories for several urban areas, with those for Toronto and Hamilton being regularly updated. In addition, certain municipalities have also done work on the development of emission inventories. However, the approaches to estimating emissions often vary from location to location, making it difficult to compare many of the inventories.

At the federal level, a nationwide inventory of emissions for 1970 was published under the auspices of Environment Canada.<sup>10</sup> A standardized approach to estimating emissions was employed in this inventory, although many of the emission factors used (the ratios of pollutant emissions to outputs) were borrowed from the United States and may therefore be more relevant to their experience than to ours. This inventory represents only one point in time; nonetheless, it provides – by source, by certain pollutants, by province, and for the country as a whole – a base from which more detailed estimations can be undertaken.

9 B.C. Research Council, *Environmental Pollution Studies: Air Quality in British Columbia*, Project 2328 (1970), and *Appendix* (1972).

10 Air Pollution Control Directorate, *A Nationwide Inventory of Air Pollutant Emissions, 1970* (Ottawa: Environment Canada, 1973).

## APPENDIX B

### *The Economy to 1982 under Alternative Assumptions for the Price of Energy*

The performance indicators discussed in Chapter 3 give the broad dimensions of an economy moving at a realistic potential rate over the three-year period ahead. This medium-term perspective is necessarily linked with longer-term developments in the economy. Such developments, however, cannot be projected with a high degree of accuracy, since there are many unknowns for which major assumptions need to be made. Rather than show one outline of the possible long-term future, in this Appendix we examine various profiles of growth according to a choice of critical assumptions. Because of the particular uncertainty about energy developments, this area was selected as a basis for simulating alternative scenarios. The hypothetical nature of the projections should therefore be stressed at the outset.

The energy situation has been discussed at some length in Chapter 5. In the following section, the salient features of our scenarios are presented, and our other assumptions about the domestic economy and the external environment are discussed. Following this, the main contours of the economy to 1982, assuming a medium-price level for energy products, are outlined. In the last section, the effects on the economy of different energy-price assumptions are displayed.

The 1975-82 period was chosen for analysis because it is particularly sensitive to our assumptions about prices and investment in the energy sector. In addition, 1982 is the last year for which it was possible to obtain data on the future development of the U.S. economy, on the basis of the projections of the Wharton Model. The projection period is compared with the 1964-72 period, the years 1964 and 1972 corresponding roughly to the same phase of a business cycle. The CANDIDE model was used in the preparation of these projections.

#### MAIN ASSUMPTIONS TO 1982

The main assumptions for the economy can be divided into two broad categories: those pertaining to the domestic economy, and those related to the external environment. Energy-related assumptions, demographic



developments, and government policy variables, for example, would comprise the first group, while the second would include, for example, the rate of growth of the U.S. Gross National Product and overseas industrial production.

### Domestic Economy

The energy assumptions for each simulation are different, forming the basis for the difference in results between scenarios A, B, and C. The relatively low-price assumption (scenario A) is associated with high energy consumption, high energy imports, low energy investment, and relatively slow development of domestic energy resources. The relatively high-price simulation (scenario C) is associated with low energy consumption, high energy investment, and rapid development of domestic resources. Scenario B describes a medium-price situation. The salient features of the three sets of assumptions are depicted in Table B-1. The price and the import and export assumptions summarized here are described in Tables 5-4 and 5-5.

**Table B-1**  
**Main Crude Oil Assumptions, 1975-82**

	A	B	C
	(Average annual percentage change)		
Production	0.1	0.6	2.6
Consumption	7.0	5.6	4.5
Imports	6.3	4.4	2.7
Exports	-16.3	-10.0	-1.6
	(Billions of current dollars)		
Energy investment (cumulative total)	73.4	85.2	93.9

By 1980 the domestic wellhead price of crude oil is assumed to be \$6.00, \$7.00, and \$8.50 per barrel in the relatively low-, medium-, and high-price scenarios; the export tax on crude oil, to be \$1.40 per barrel in all cases. The price of natural gas in 1980 is assumed to be roughly equal to oil, in BTU equivalents, and is \$1.00, \$1.15, and \$1.40 per thousand cubic feet for the three respective scenarios. The energy investment assumptions are set out in Chapter 5 and in Table B-3. The major differences in assumptions about exogenous energy investment are related to petroleum and natural gas and the pipelines for their transport. This reflects construction of the Mackenzie Valley gas pipeline, which occurs only in the medium- and high-price scenarios, as well as the differing magnitudes of investment in tar-sands plants. The low-price scenario includes two new plants at

various stages of construction over the 1975-82 period; the medium-price scenario, four; and the high-price scenario, eight. Total additional energy investment is \$2.7 billion in the low-, \$11.9 billion in the medium-, and \$18.4 billion in the high-price scenarios.

On the demographic side, the present and projected low birth rate, in combination with the movement through the age structure of population born in the postwar years, results in a marked shift in the composition of the population by the early 1980s. The population projections in Table B-10 assume a relatively low fertility rate over the period (64.5 births per annum per 1,000 women aged 15 to 49). Net immigration, which is assumed to respond to varying economic conditions and, in particular, to changes in the unemployment rate, averages about 105,000 persons per year over the 1975-82 period. The most rapid growth in population occurs in the 25-34 age group, which is expected to increase at an average rate of 3.8 per cent, as opposed to 1.4 per cent for the total population and 2.0 per cent for the working-age population. The low fertility rate and the shift in structure of the population mean that the 0-14 age group accounts for only 23.5 per cent of total population by 1980, compared with 28.8 in 1972, and the 25-44 age group increases from 25.3 per cent of the total in 1972 to 29.2 per cent by 1980.

The level and growth of the labour force is determined by the population in various age-sex groups and by participation rates, which, in turn, are dependent on economic conditions. The projections in all three simulations show the maintenance of the high participation rates that existed in the early 1970s. For example, in scenario B, the participation rate for women under 35 increases from 45 per cent in 1973 to 46.8 per cent and 54.1 per cent, respectively, in 1975 and 1980. The shift in population structure and the high participation rates in the secondary labour force result in average annual growth of 2.5 per cent for the primary labour force from 1975 to 1982 and 2.8 per cent for the secondary labour force over the same period. This compares with 1.8 per cent for the primary labour force and 4.2 per cent for the secondary labour force in 1964-72 (Table B-10).

In the government sector, income tax rates are assumed unchanged from the 1972 Tax Reform, and indirect tax rates to remain generally at their 1972 level (Table B-4). The federal personal income tax rate on the first \$500 taxable income declines to 6 per cent in 1976, remaining at that level through 1982. The indexing of personal income tax brackets and exemptions has also been taken into account in the simulations. The federal corporate income tax rate declines to 29.0 per cent in 1976 to take account of the 1972 Tax Reform changes and is subsequently left at that level. The provincial corporate income tax rate is held at 11.8 per cent throughout the simulation period. These corporate tax rates are weighted averages of nominal rates.

Recent developments, such as the commodity-prices boom and high labour force participation, were taken into consideration in the shaping of the following projections. Another significant development is the substantial increase in farm income in 1973. Net income received by farm operators from farm products increased by 86.1 per cent to about \$3 billion in 1973. For the 1975-82 period, net farm income grows at 6.8 per cent annually in scenario B (Table B-12), reflecting the impact of higher world prices for agricultural products.

### External Environment

Turning to the external environment, the U.S. Gross National Product is expected to grow in real terms at an average annual rate of 4.3 per cent from 1975 to 1982 (Table B-2). This is somewhat above the present estimates of potential for the United States economy,<sup>1</sup> as some catching-up from the depressed 1974 levels is assumed. The GNP deflator increases at an average of 4.6 per cent per annum over the same period; the unemployment rate averages 4.4 per cent; and growth in U.S. industrial production is projected at 4.2 per cent. These assumptions about the United States economy are drawn largely from the June 1974 solution of the Wharton Annual and Industry Forecasting Model.

After a relatively buoyant period, overseas industrial production is expected to grow more slowly from 1975 to 1982, at an average of 5.9 per cent per annum, compared with 7.3 per cent between 1964 and 1972. The implicit price deflator for exports of goods and services is expected to increase at an average annual rate of 2.6 per cent in the 1975-82 period in scenario B and, for imports, at 3.6 per cent per annum (Table B-13). This takes account of the rapid increase in commodity prices in 1973. The largest price increases for exports in 1973 were seen in agricultural products and primary industrial materials, including fuel; the same holds true for imports.

The external value of the Canadian dollar is assumed to remain 2 per cent higher than the U.S. dollar until 1980 when it drops back to parity. Our assumption is that the value of the dollar would be sustained by inflows of foreign capital during the period of heavy energy investments. After the peak of the investment period, a moderate devaluation is assumed to bring about a more acceptable balance of foreign trade.

1 For a discussion of the United States potential growth of output, currently set at 4 per cent for the period after 1969, see U.S. Department of Commerce, *Business Conditions Digest* (April 1974), Table E1 and accompanying note.

### **DIMENSIONS OF GROWTH IN A MEDIUM-PRICE ENERGY SCENARIO**

The projected growth rates for the main aggregates in the 1975-82 period are not very different from those that existed from 1964 to 1972. There are, however, several important changes in the structure of the expected expansion. Additional investments are required for the development of natural resources; the structure of population shifts so that Canadian population is older; and there is a transition from an economy with available factors of production, usable on relatively short notice, to one in which full use is made of productive capacity in some sectors. In addition, external trade, whose vigorous growth was a significant factor of economic expansion in the 1960s, is projected to slow down.

The volume of GNP increases at an annual average rate of 5.3 per cent from 1975 to 1982, somewhat more rapidly than that of the 1964-72 period (Table B-5). Employment grows at an average of 2.9 per cent yearly, while labour productivity increases at a relatively low rate of 2.2 per cent despite strong growth in the capital stock. This overall picture is related to the rapid development of the service sector, where measured productivity growth is below that of other sectors. In addition, large productivity gains are also often more difficult to achieve in conditions of high utilization of production factors.

The structure of expenditures is different in the two periods under study (Table B-6). At the consumer level, growth in durable and non-durable outlays is roughly the same as in previous years, but the increase in service spending is clearly stronger – 6.3 per cent per year in constant dollars in the 1975-82 period compared with 4.5 per cent from 1964 to 1972. The slower growth of services during the 1960s is partly illusory, as it reflected a shift of some health-care services from the private to the public sector at the end of the decade. No such shifts are assumed during the projection period.

Real expenditures for housing increase less rapidly between 1975 and 1982 than during the earlier period – that is, at 3.6 per cent rather than 5.4 per cent. However, total housing starts rise from an annual average of 193,000 to 253,000 units in the projection period (Table B-5). The increase in average housing starts, in turn, produces faster growth in the stock of houses. Given a more moderate increase in the number of households, this acceleration in the growth of the housing stock is accompanied by a rise in the vacancy rate throughout the period 1975 to 1982.

Plant and equipment outlays are expected to grow strongly between 1975 and 1982, to an average annual constant-dollar rate of 6.2 per cent from only 3.7 per cent in the 1964-72 period (Table B-7). This would



reflect some catching-up in the expansion of productive capacity in relation to previous years as well as the large additions to investment in the energy sector.

Total government expenditures rise less rapidly in 1975-82 than in 1964-72, in spite of a small acceleration in the rate of public investment (Table B-7). The slowdown is primarily attributable to transfer payments to persons, which increase 8.5 per cent per year between 1975 and 1982 compared with 16.1 per cent between 1964 and 1972. The more favourable projected labour market picture would result in a slowdown in the growth of unemployment and welfare benefits, compared with the situation at the end of the 1960s and the beginning of the 1970s. Also, it must be recalled that during this earlier period the Canada Assistance Plan was implemented. No new programs or major adjustments to existing programs are assumed during the 1975-82 period. Nominal tax rates would also generally remain unchanged, by assumption.

The development of external trade is seen to be less vigorous in the future. The growth of total exports drops from 9.2 per cent in constant dollars in 1964-72 to 4.9 per cent in 1975-82, and that of imports from 8.1 to 5.0 per cent (Table B-6). This slowing-down is not a result of changes in foreign demand, which, according to our assumptions, remain comparable to previous years, and perhaps even stronger; rather it is because of the changes in markets for automobiles and, to a lesser extent, variations in the available supply of crude oil. The scope for increasing automotive exports to the United States at a rapid rate decreased as exports rose from a very low level to a high level under the Automotive Agreement of 1965. By around 1970 the reorganization of the Canadian automotive industry had been completed, and the growth of exports and imports reverted to more normal rates thereafter. As for petroleum products, expansion of the domestic market progressively reduces supplies available for export.

Some changes in the composition of Gross National Expenditure have significant effects on the distribution of production activities. The large investment in structures for the development of natural resources accelerates the expansion of the construction sector. Growth of output in this industry rises from 3.8 per cent in 1964-72 to 5.4 per cent in 1975-82 (Table B-11). On the other hand, world demand for agricultural and forest products stimulates output in these sectors. The growth rate of agricultural output, in constant dollars, increases from 1.6 per cent in 1964-72 to 4.1 per cent in 1975-82, and that of forest products jumps from 1.0 to 5.2 per cent.

Changes projected in the composition of output are not entirely reflected in changes in the overall structure of the demand for labour. In fact, productivity gains associated with the faster growth of the capital stock in agriculture and forestry encourage departures from the former sector



and limit the number of additional jobs in the latter (Table B-11). But labour demand in the construction industry increases markedly to 2.5 per cent in 1975-82, from 1.4 per cent in 1964-72. This suggests that new investment in nonresidential construction generates employment in that sector, although its influence on total employment is weak. The increase in total employment is projected at 2.9 per cent for the 1975-82 period.

On the labour supply side, the working-age population increases less rapidly between 1975 and 1982 because of the demographic trends described in our assumptions. Thus the growth of the labour force decelerates to 2.7 per cent between 1975 and 1982 compared with 3.1 per cent between 1964 and 1972. This, in combination with the strong growth in employment, explains the lower rate of unemployment. The unemployment rate averages 4.3 per cent per year from 1976 to 1982, which represents a 0.7 percentage point drop compared with the previous period (Table B-5).

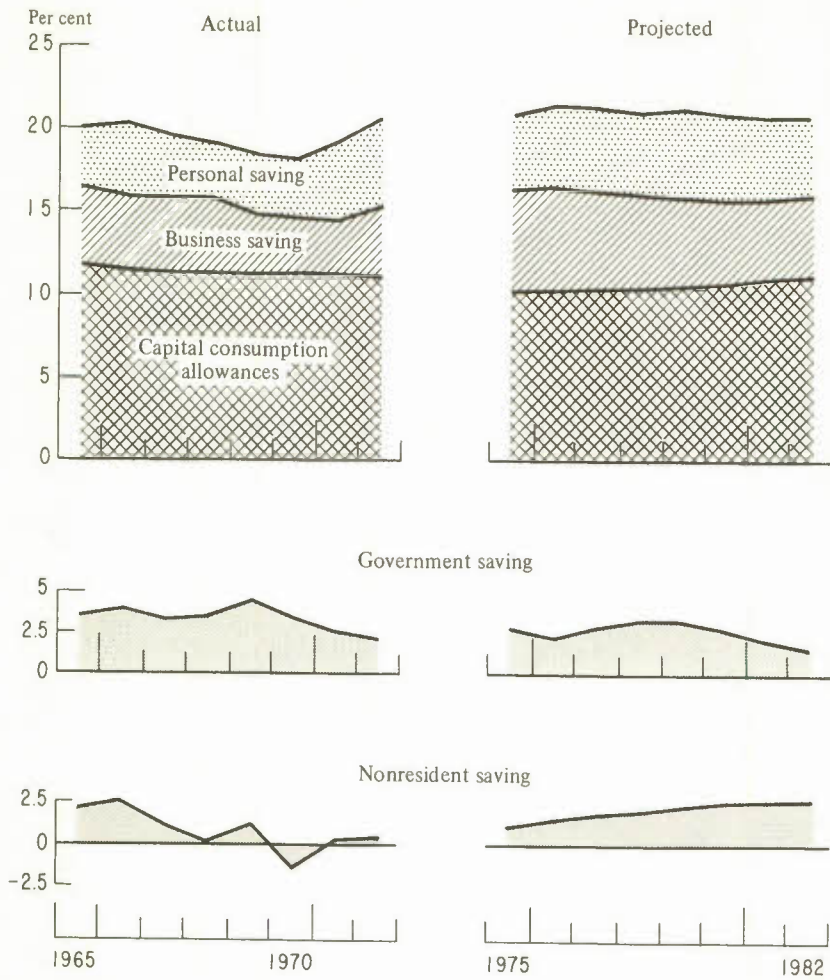
The rapid growth of personal disposable income at 9.6 per cent in nominal terms between 1975 and 1982 is facilitated by a reduction in the growth of direct taxes and social security contributions (Table B-12). This is consistent with our assumptions about future personal income tax rates. Since prices are projected to increase by 4.1 per cent and population by 1.4 per cent annually, real personal disposable income per capita grows at an average annual rate of 4.0 per cent, or slightly faster than during the 1964-72 period.

Inflationary pressures would also have an impact on financing requirements. Total investment in current dollars increases at an average rate of 10 per cent from 1975 to 1982 (Table B-8), which is 2.6 percentage points higher than the annual increase in the previous period. Higher price increases, together with faster real growth in investment outlays, result in an increase of their share of GNP in current dollars to 25.6 per cent on average in 1976-82 from 23.3 per cent in 1965-72.

Considerable savings will be required in the coming years to finance investment requirements. Our projections indicate important changes in the structure of savings, involving a shift from government saving and capital consumption allowances to personal and corporate savings and a more intensive use of foreign capital (Chart B-1). The share of government saving in our projections drops from 3.3 per cent in 1965-72 to 2.5 per cent in the 1976-82 period. This decline is due to lower budgetary surpluses in relation to GNP during the projection period. The average share of capital consumption allowances declines from 11.5 to 10.8 per cent following relatively small additions to the capital stock from 1965 to 1972. On the other hand, the personal-saving share of GNP increases from 4.1 to 4.9 per cent; that of business saving rises even more, from 3.8 to 5.2 per cent, the increased proportion being met primarily from a higher share of retained earnings.

Chart B-1

Source of Saving as a Percentage of Gross National Product, 1965-82



SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.

Domestic savings do not meet capital needs during this period of massive investment. Nonresident saving accounts for 2.2 per cent of GNP on average between 1976 and 1982 compared with an annual average of 0.7 per cent from 1965 to 1972. Reliance on foreign saving peaks in 1979-80, the years in which investments for the development of energy resources are concentrated. Nonresident saving then reaches 2.6 per cent of GNP.

### THE ECONOMY UNDER ALTERNATIVE ENERGY PRICE AND INVESTMENT ASSUMPTIONS

The major differences in scenarios A, B, and C relate to the energy price and investment assumptions. While the major impact of the recent rapid increase in oil prices is felt in 1974 in all three simulations, the impact of the higher energy investment paths postulated in B and C will not come until the late 1970s and early 1980s. In both scenarios the additional energy investment requirements peak in 1979, although at different levels.

The discussion in this section focuses on the differences between the scenarios. Changes in the major aggregates are mentioned first, to give an overall view of the differences in the simulations, and are then followed by a more detailed analysis of the underlying factors. Unless otherwise noted, the focal period for the analysis is 1975-82.

#### Scenario C: High-Price Assumption

The overall picture is one of stronger growth, with a somewhat higher rate of price increase than in scenario B (Table B-4). Average annual growth in real GNP is 0.1 percentage point above B, while the average change in the GNE deflator is 0.2 percentage point higher. Unemployment averages 4.2 per cent over 1976-82, as opposed to 4.3 per cent in scenario B. The balance on current account remains in deficit, but averages only 1.7 per cent of GNP, compared with 2.0 per cent in B. Over the 1975-82 period as a whole, there is no change in the growth of either real personal disposable income per capita or real consumer expenditures. The government budget balance shows a higher surplus in C, averaging 0.7 per cent of GNP over 1976-82. Both personal and corporate savings are higher, increasing at average rates of 10.7 per cent and 6.2 per cent, respectively, as opposed to 10.0 per cent and 5.5 per cent in the medium-price simulation. As a result, total savings grow at an average rate of 10.4 per cent from 1975-82, compared with 10.0 per cent in B (Table B-9). Investment growth is, of course, stronger in C, largely because of the additional \$6.5-billion

investment in energy development (Table B-3). The result of this extra stimulus to the economy raises the average annual change in real business gross fixed capital formation by 0.3 percentage point (Table B-5), and government investment by 0.1 percentage point (Table B-6).

At a more detailed level the effects of the two major changes in scenario C over scenario B – increased oil and gas prices, and increased energy investment – can be traced through the economy to arrive at the situation described above. The increase in domestic and import prices of crude oil has two effects: the first is to raise the costs to those industries using crude oil and gas; the second is to raise corporate profits of the oil and gas-producing industries and royalties collected by the provincial and federal governments. The increased costs generate a higher rate of inflation than would be the case with lower oil and gas prices. This can be seen in the difference in the average change in the GNE deflator (1975-82), 4.8 per cent for the high-price simulation and 4.6 per cent for the medium-price simulation. The more rapid price increase is particularly evident in 1976, when the domestic and foreign crude oil prices in scenario C begin to differ from those in scenario B. The magnitude of additional investment is the same in the two simulations through 1975, differing only slightly in 1976, with significant diversions between the two paths not showing up until 1978. The increase in investment leads to greater commodity requirements, raising real domestic product and increasing employment. This, in turn, leads to an increase in real Gross National Product.

The increase in employment averages 0.1 percentage point above the annual increase of 2.9 per cent in scenario B (Table B-11). The generally more favourable conditions in the economy cause slight changes in participation rates in the secondary labour force but no noticeable change in labour force growth (Table B-10). The net result is a decrease in the unemployment rate to an average of 4.2 per cent. Reflecting the timing of new investments, the greatest difference in the unemployment rate between the two simulations occurs in 1979 and 1980, when investment is at its highest.

Personal disposable income is slightly higher in C, growing at an average rate of 9.8 per cent (Table B-12). However, real disposable income increases only 0.1 percentage point more than in B, growing at 5.5 per cent per annum, and consumer expenditure on goods and services is unchanged in real terms. The price deflator for consumer expenditure on goods and services increases at an average rate of 4.2 per cent, compared with 4.1 per cent in the medium-price simulation. Personal savings grow 0.7 percentage point faster in C, at 10.7 per cent per annum, with its components increasing at 10.2 per cent for discretionary and 11.8 per cent for private contractual savings, compared with 8.9 per cent and 11.5 per cent, respectively, in B (Table B-9).

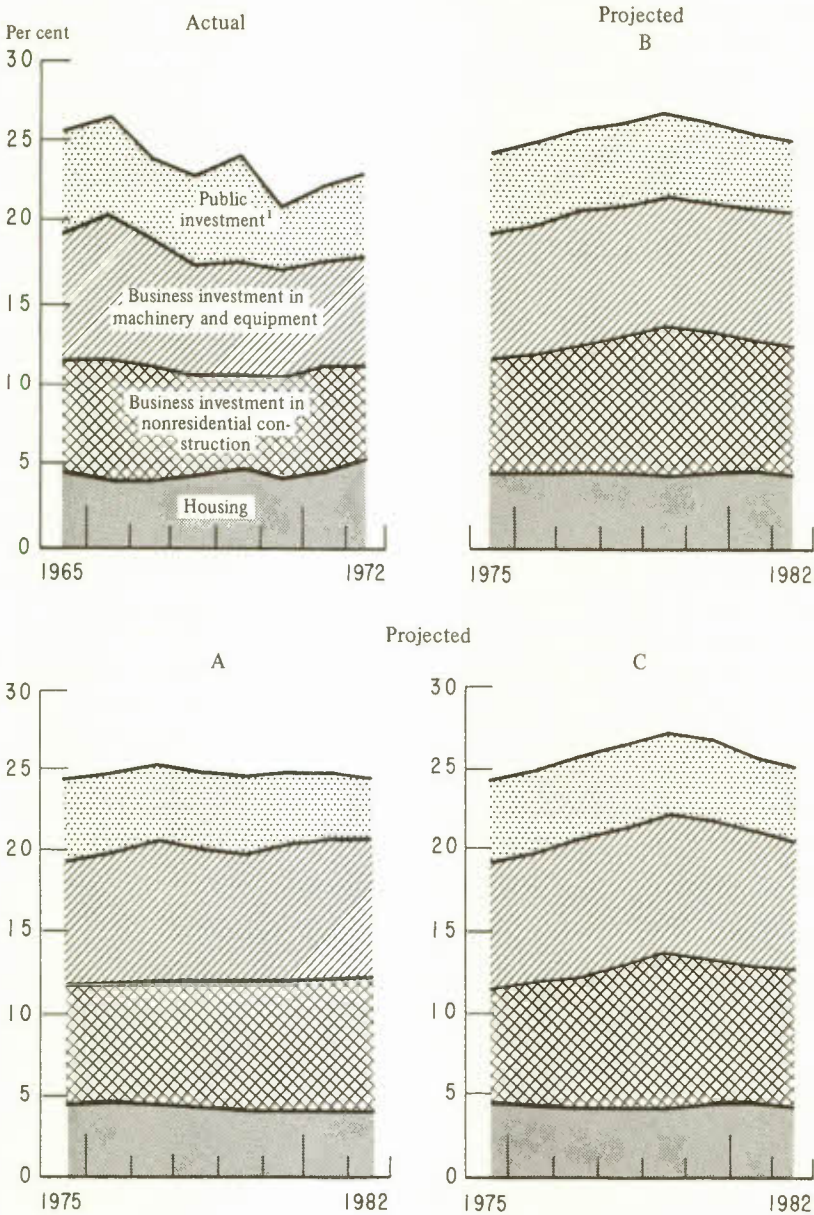
As expected, investment increases more rapidly because of the larger exogenous additions made to the energy investment categories in C



Chart B-2

Components of Total Investment Demand as Percentages of  
Gross National Product, 1965-82

(Current dollars)



<sup>1</sup> Includes government and private inventory investments.

SOURCE Based on data from Statistics Canada and estimates by the Economic Council of Canada.



(Table B-8). Business gross fixed capital formation increases at 10.9 per cent per annum, compared with 10.5 per cent in the medium-price scenario. Residential construction increases in response to the higher rate of growth in the economy. Government investment is also higher, partly as a result of increased government participation postulated in the more rapid tar-sands development.

In examining the savings generated, it is interesting to note that, while personal, corporate, and government savings are all relatively higher in C, nonresident savings as a proportion of GNP are lower than in the medium-price simulation. During 1979, the year when the additional energy investment requirements place the greatest demands on the economy, total investment reaches a high of 27.3 per cent of Gross National Product, a level matched only in 1956. This compares with 26.5 per cent in the medium-price simulation (Chart B-2). In that year personal savings in C represent 5.0 per cent of GNP; corporate savings, 5.6 per cent; government savings, 3.8 per cent; capital consumption allowances, 10.6 per cent; and nonresident savings, 2.3 per cent. This compares with 5.0 per cent, 5.3 per cent, 3.1 per cent, 10.7 per cent, and 2.4 per cent, respectively, in B. This pattern holds until 1982, with personal savings maintaining the same proportion of GNP as in B. Corporate and government savings maintain larger shares, and nonresident savings are consistently lower.

Higher corporate saving reflects faster growth in corporate profits, while increased government saving reflects higher royalty receipts and larger income tax revenue associated with our assumptions of a higher price for energy products. The reduced share of nonresident saving corresponds to a shift in the crude oil trade balance arising from our assumptions of a larger volume and a higher price for crude oil exports in scenario C. This reduction in the degree of reliance on foreign saving must, however, be put in perspective. The current account deficit in C averages about \$4.2 billion per year, only \$550 million less than in B. In addition, nonresident saving in the neighbourhood of 2.3 per cent of GNP in 1979, while not high relative to the 4.2 per cent level of 1956 and 1957, is higher than any level reached during the sixties and early seventies.

### **Scenario A: Low-Price Assumption**

With relatively low prices for crude oil and natural gas, and comparatively small additions of energy investment, scenario A exhibits slower growth than B, a lower rate of price increase, and a slightly higher unemployment rate. Real Gross National Product grows at an average annual rate of 5.1 per cent over 1975-82, compared with 5.3 per cent

in B. The rate of increase in the GNE price deflator is 0.3 percentage point below the 4.6 per cent rate in B. Unemployment averages 4.6 per cent, resulting from a combination of a slower growth in employment of 2.7 per cent per annum and slower labour force growth of 2.6 per cent per annum. The current account is still in deficit over this period, but to the extent of 2.1 per cent of GNP, compared with 2.0 per cent in B. There is a decline in the growth of both personal income and real disposable income per capita. Consumer expenditures show a corresponding slowdown, growing in real terms at 5.2 per cent annually, as opposed to 5.4 per cent in the medium-price simulation. The government budget balance is in deficit over most of the 1976-82 period, averaging \$705.3 million, while the budget in B shows a surplus of \$466.5 million per annum, on average (Table B-5).

As a result of the lower growth in personal disposable income, the annual increase in personal saving is 0.7 percentage point below the 10.0 per cent rate of B. Corporate saving is 0.7 percentage point below the 5.5 per cent rate in B, and government saving increases at an average rate of only 2.8 per cent, down 1.4 per cent. Nonresident saving is higher by 1.4 percentage point, growing at 22.6 per cent per annum, as opposed to 21.2 per cent in B. Total savings grow at 9.6 per cent, 0.4 percentage point below scenario B (Table B-9).

Investment growth reflects the additional investment assumptions, as well as the repercussions of slower growth in the economy in general. Additional energy investment totals only \$2.7 billion over 1975-82, in scenario A, compared with \$11.9 billion in scenario B. All components of investment are down, with overall investment growth at 9.6 per cent compared with 10 per cent in B (Table B-8).

Looking at the immediate determinants of the slower growth, it is important to note again the two major differences between scenarios A and B. First, the price of crude oil in A falls to \$6.00 a barrel in 1976, compared with \$7.00 in B, and the increase in the natural gas price, to reach BTU equivalence with oil by 1980, is correspondingly lower in B. Second, the additional energy investment in A is, as noted above, substantially lower than in B.

While the lower energy prices exert less inflationary pressure on the economy, they also lead to lower industry revenues and lower government receipts from taxes and royalties. The lower prices and slower growth result in lower corporate profits, growing at 6.7 per cent before taxes in A, compared with 7.1 per cent in B. Corporate savings decline correspondingly from a growth of 5.5 per cent to 4.8 per cent. The slower growth in personal and corporate income reduces growth in government revenue (Table B-7).

The lower level of energy investment in A generates less demand for commodity requirements and a corresponding slowdown in employ-

ment. Employment grows at 2.7 per cent per annum, compared with 2.9 per cent in scenario B. Labour force growth falls to 2.6 per cent per annum in A for 1975-82, compared with 2.7 per cent in B. Taken together, these factors result in an average unemployment rate increasing to 4.6 per cent compared with 4.3 per cent in scenario B.

## CONCLUSION

At the risk of oversimplification, the findings of our examination of future prospects assuming alternative price levels for energy products are summarized here.

- The potential for growth that Canada can realistically seek to achieve would not significantly change over the simulation period. Our projections show growth in the volume of GNP in the neighbourhood of 5 to 5½ per cent per annum over the period 1975 to 1982. Yet several factors, such as the changing composition of the labour force and the changing structure of industrial activity, would suggest the possibility of a reduction in the level of potential growth over the longer run.
- Canada's population would reach about 25 million in 1982 and would be growing generally older. The prime-age labour force group would grow significantly faster than the younger age groups, a reversal from the trend of the 1964-72 period. To reduce the unemployment rate to an average of about 4.5 per cent over the period 1975-82, 2 million jobs would need to be created.
- The dominant force in the economy for the remainder of the seventies and early eighties would be investment demand. Consumer spending would continue to grow strongly, but growth trends for residential construction outlays, government current expenditures, and exports and imports of goods and services would slow down markedly in comparison with those of the sixties and early seventies.
- Despite the assumption of a favourable external environment, Canada's foreign trade exhibits much less vigour in the period ahead. Factors such as the decline in the value of the Canadian dollar and the auto pact with the United States, both of which provided considerable stimulus to our trade in the sixties, are not expected to be present in the remainder of the seventies. In our three scenarios the current account deficit as a proportion of GNP is projected to be large in relation to the immediate past.
- Canada faces formidable capital requirements over the coming years. Between 1975 and 1982, cumulative investments, expressed in current dollars, would total \$430, \$455, and \$470 billion, respectively, assuming slow, medium, and fast development of energy

resources. To finance these investments would require that resources be drawn from outside Canada to supplement domestic savings under the conditions assumed to prevail over the period from 1975 to 1982. As a proportion of GNP, nonresident saving would range between an average of 1.9 and 2.3 per cent compared with less than one per cent over the 1965 to 1972 period. It should be noted, however, that this latter period was one of considerable strength in foreign demand with a relatively low investment profile, while the period 1975-82 is one of booming investment outlays and a weak external sector.

- Our projections also show that the higher the price of energy products, the less reliance would need to be placed on foreign savings to finance investment requirements. Under our assumptions, with higher prices on energy products, domestic consumption is lower and the development of energy resources greater. Thus there is more energy available for export, and import requirements are smaller. With the higher prices, corporate and government revenue and savings also increase. Assuming continued demand for oil exports, a smaller current-account-balance deficit results from the increased exports and lower imports.



**Table B-2**  
**Selected Assumptions Relating to the External Environment, 1975-82**

	Actual	Projected 1975-82		
	1964-72	A-B	B	C-B
(Average annual percentage change)				
U.S. economy				
Real GNP	3.4	0.0	4.3	0.0
GNP deflator	4.1	0.0	4.6	0.0
Industrial production (index)	3.5	0.0	4.2	0.0
Mining (real)	2.1	0.0	1.3	0.0
Nondurables manufacturing (real)	4.4	0.0	4.0	0.0
Durables manufacturing (real)	2.7	0.0	4.7	0.0
Public utilities (real)	6.0	0.0	4.4	0.0
Manufacturing and mining wage rate	6.2	0.0	7.6	0.0
Rest of world				
Japan, U.K., EEC industrial production	7.3	0.0	5.9	0.0
U.K. real GDP	2.1	0.0	3.3	0.0
Exports, imports, prices				
Exports of grains (volume)	1.6	0.0	3.5	0.0
Exports of grains (prices)	-1.5	0.0	2.5	0.0
Exports of crude, natural gas, sulphur (volume)	17.4	-2.8	-4.7	3.4
Exports of crude, natural gas, sulphur (prices)	0.8	-1.1	0.8	1.7
Imports of fuel (volume)	3.7	1.4	4.1	-1.3
Imports of fuel (prices)	5.6	-0.5	0.6	1.1
	1965-72	Projected 1976-82		
		(Annual averages)		
U.S. unemployment rate (%)	4.4	0.0	4.4	0.0
Canadian exchange rate (cents/\$U.S.)	105.4	0.0	98.9	0.0

NOTE In this and the following tables, the column headings A-B and C-B refer to the differences (in percentage points) in growth rates between scenarios. Thus if imports of fuel increase at 4.1 per cent per year in scenario B and 5.5 in scenario A, A-B will be shown as 1.4 (see Table B-2).



Table B-3  
Gross Fixed Capital Formation in Energy, 1975-82

	Endogenous Investment			Exogenous Investment			Total Investment		
	A-B	B	C-B	A-B	B	C-B	A-B	B	C-B
(Cumulative total, 1973-82, in billions of current dollars)									
Electrical utilities	-0.8	50.9	0.4	0.0	0.0	0.0	-0.8	50.9	0.4
Gas distribution	-0.1	5.0	0.1	0.0	0.0	0.0	-0.1	5.0	0.1
Petroleum and natural gas	-1.5	19.1	1.6	-2.9	5.5	6.3	-4.4	24.6	7.9
Petroleum and natural gas pipelines	-0.1	6.9	0.1	-6.3	6.5	0.2	-6.5	13.4	0.3
Total	-2.6	81.8	2.2	-9.2	12.0	6.5	-11.8	93.8	8.7
Total (1975-82)	-2.6	73.3	2.2	-9.2	11.9	6.5	-11.8	85.2	8.7

**Table B-4**  
**Selected Assumptions about Tax Rates, 1975-82**

	Actual		Projected	
	1964	1972	1975	1982
<b>Personal income tax</b>				
Before tax reform				
Federal tax rate on \$5,000 taxable income	16.0	17.8	—	—
Provincial tax rate on \$5,000 taxable income	3.0	7.5	—	—
Taxable income/assessed income (%)	56.3	65.0	—	—
After tax reform				
Federal tax rate on first \$500	—	—	9.0	6.0
Federal tax rate on second income bracket	—	—	18.0	18.0
Average personal exemption/tax return (\$000)	—	—	2.3	2.3
Weighted provincial personal income tax rate	—	—	39.4	39.4
<b>Corporate income tax</b>				
Federal rate	35.2	31.8	29.4	29.0
Provincial rate	10.7	11.6	11.8	11.8
<b>Indirect tax rates</b>				
Federal sales tax rate on consumer goods	11.0	12.0	12.0	12.0
Federal sales tax rate on building materials	7.0	11.0	11.0	11.0
Effective rate custom duties	8.3	6.1	6.1	6.1
Weighted average provincial retail sales tax rate	3.7	5.5	6.3	6.3
Tobacco tax (\$/1,000 cigarettes)	9.0	10.0	10.0	10.0
Alcohol tax (\$/proof gallon)	13.0	14.3	14.3	14.3

**Table B-5**  
**Main Aggregates, 1975-82**

	Actual 1964-72	Projected 1975-82		
		A-B	B	C-B
(Average annual percentage change, 1961 dollars)				
Real Gross National Product	5.0	-0.2	5.3	0.1
Output per person employed	2.3	0.0	2.2	0.1
Stock of business capital	5.3	-0.4	6.8	0.2
Business capital per person employed	2.4	-0.2	3.8	0.1
Consumer expenditures	4.7	-0.2	5.4	0.0
Residential construction	5.4	-0.5	3.6	0.4
Plant and equipment outlays	3.7	-0.4	6.2	0.3
Government expenditures on goods and services	5.9	-0.1	4.8	0.1
Exports of goods and services	9.2	-0.1	4.9	0.2
Imports of goods and services	8.1	-0.1	5.0	0.1
(Current dollars) <sup>1</sup>				
Corporate profits before taxes	6.8	-0.4	7.1	0.5
Personal income	10.2	-0.4	10.2	0.2
Personal disposable income	8.9	-0.4	9.6	0.2
Real personal disposable income per capita	3.6	-0.1	4.0	0.0
(Calculated on the basis of number of persons)				
Employment	2.8	-0.2	2.9	0.1
Labour force	3.1	-0.1	2.7	0.0
Population	1.6	-0.1	1.4	0.0
(Calculated on the basis of index numbers)				
GNE price deflator	4.0	-0.3	4.6	0.2
Consumer expenditure price deflator	3.4	-0.2	4.1	0.1
Consumer price index	3.7	-0.2	4.6	0.1
	1965-72	Projected 1976-82		
		(Annual averages)		
Housing starts (000 units)	193.3	-4.4	253.2	-0.7
Current account balance (million \$ current)	-388.4	-28.7	-4,779.1	552.9
Current account balance (% GNP)	-0.6	-0.1	-2.0	0.3
Government surplus (+) or deficit(-) (million \$ current)	434.3	-1,171.8	466.5	1,162.7
Government surplus (+) or deficit (-) (% GNP)	0.6	-0.5	0.2	0.5
Unemployment rate	5.0	0.3	4.3	-0.1

<sup>1</sup> Except for real personal disposable income per capita, which is calculated in 1961 dollars.

**Table B-6**  
**Demand Configuration, 1975-82**

	Actual 1964-72	Projected 1975-82		
		A-B	B	C-B
	(Average annual percentage change in 1961 dollars)			
Consumer expenditures on goods and services	4.7	-0.2	5.4	0.0
Durable goods	5.9	-0.2	5.7	0.1
Nondurable goods	4.5	-0.1	4.3	0.0
Semidurable goods	4.5	-0.2	4.3	0.1
Services	4.5	-0.2	6.3	0.0
Government current expenditures on goods and services	6.6	-0.2	5.1	0.0
Government gross capital formation	3.4	-0.1	3.8	0.1
Residential construction expenditures	5.4	-0.5	3.6	0.4
Investment in machinery and equipment	4.8	-0.3	5.6	0.5
Investment in nonresidential construction	2.3	-0.4	7.0	0.2
Exports of goods and services	9.2	-0.1	4.9	0.2
Goods	10.2	-0.1	4.9	0.2
Agricultural products	4.2	0.0	3.6	0.0
Industrial products	5.7	-0.3	4.3	0.5
Primary	8.5	-0.8	3.1	1.2
Processed	4.2	0.0	5.2	0.0
Automobiles and other advanced manufactured products	17.9	0.0	5.7	0.0
Services	4.2	-0.2	4.5	0.2
Imports of goods and services	8.1	-0.1	5.0	0.1
Goods	9.1	-0.1	5.1	0.1
Agricultural products	4.4	-0.3	4.0	0.2
Industrial products	6.5	0.1	5.2	-0.1
Automobiles and other advanced manufactured products	11.8	-0.2	5.2	0.2
Services	5.8	-0.2	4.8	0.1
Real Gross National Product	5.0	-0.2	5.3	0.1

**Table B-7**  
**The Government Sector, 1975-82**

	Actual 1964-72	Projected 1975-82		
		A-B	B	C-B
		(Average annual percentage change in current dollars)		
Expenditures				
Current expenditures on goods and services	13.3	-0.5	12.2	0.2
Gross capital formation	7.1	-0.4	8.9	0.3
Transfer payments to persons	16.1	0.0	8.5	0.0
Other transfers	12.6	0.1	7.6	-0.1
of which: Interest on public debt	13.9	0.0	8.9	0.0
Total government expenditures	13.1	-0.3	10.5	0.1
Revenue				
Direct taxes on persons	17.2	-0.4	12.5	0.2
Personal income tax	18.8	-0.4	13.3	0.2
Other	12.2	-0.1	9.2	0.1
Direct taxes on corporations	7.6	-0.4	9.5	0.5
Indirect taxes	9.3	-0.2	8.0	0.2
Other government revenue	17.8	0.1	9.0	0.5
Other transfers from persons	17.4	0.0	8.0	0.0
Investment income	19.1	0.1	9.1	0.6
Taxes on nonresidents	8.1	-0.2	10.5	0.1
Total government revenue (including capital consumption allowance)	12.6	-0.2	10.1	0.3



**Table B-8**  
**Investment, 1975-82**

	Actual 1964-72	Projected 1975-82		
		A-B	B	C-B
	(Average annual percentage change in current dollars)			
Business gross fixed capital formation	7.9	-0.5	10.5	0.4
Residential construction	10.7	-0.9	9.4	0.6
Nonresidential construction	7.1	-0.3	11.9	0.3
Machinery and equipment	7.0	-0.3	9.6	0.5
Government gross fixed capital formation	7.1	-0.4	8.9	0.3
Residential construction	13.2	-0.4	5.7	0.2
Nonresidential construction	7.2	-0.4	8.8	0.3
Machinery and equipment	6.1	-0.4	9.7	0.2
Total investment <sup>1</sup>	7.4	-0.4	10.0	0.4
	1965-72	Projected 1976-82		
	(Average annual percentage share of GNP in current dollars)			
Business gross fixed capital formation	18.25	-0.72	20.80	0.42
Residential construction	4.58	-0.03	4.57	-0.05
Nonresidential construction	6.45	-0.59	8.35	0.28
Machinery and equipment	7.22	-0.10	7.88	0.18
Government gross fixed capital formation	4.07	-0.04	3.58	0.07
Residential construction	0.00	0.00	0.00	0.00
Nonresidential construction	3.57	-0.04	3.17	0.07
Machinery and equipment	0.49	-0.01	0.41	-0.02
Total investment <sup>1</sup>	23.31	-0.78	25.64	0.50

<sup>1</sup> Including changes in the value of inventories and the residual error of estimate.

**Table B-9**  
**Savings, 1975-82**

	Actual 1964-72	Projected 1975-82		
		A-B	B	C-B
(Average annual percentage change in current dollars)				
Personal savings	15.8	-0.7	10.0	0.7
of which: Discretionary saving	24.0	-1.0	8.9	1.3
Private contractual saving	10.4	-0.6	11.5	0.3
Corporate savings	6.5	-0.7	5.5	0.7
of which: Undistributed profits	9.3	-0.4	5.0	0.5
Government savings	4.6	-1.4	4.2	2.7
Nonresident savings	n.c.	1.4	21.2	-2.9
Capital consumption allowances	8.2	-0.8	11.6	0.5
Total saving <sup>1</sup>	7.4	-0.4	10.0	0.4
	1965-72	Projected 1976-82		
(Average annual percentage share of GNP in current dollars)				
Personal savings	4.13	0.00	4.89	-0.08
of which: Discretionary savings	1.78	-0.02	1.91	-0.05
Private contractual savings	2.26	0.02	2.55	-0.03
Corporate savings	3.76	-0.25	5.24	0.28
of which: Undistributed profits	4.31	-0.29	5.79	0.32
Government savings	3.29	-0.56	2.51	0.57
Nonresident savings	0.69	0.07	2.22	-0.29
Capital consumption allowances	11.50	-0.03	10.77	0.02
Total saving <sup>1</sup>	23.31	-0.78	25.64	0.50

n.c. = not calculated.

<sup>1</sup> Including the adjustment on grain transactions and the residual error of estimate.

**Table B-10**  
**Population and the Labour Force, 1975-82**

	Actual 1964-72	Projected 1975-82		
		A-B	B	C-B
(Average annual percentage change)				
Population	1.6	-0.1	1.4	0.0
Working-age population	2.5	-0.1	2.0	0.0
14-19	2.9	0.0	-0.6	0.0
20-24	5.1	-0.1	2.2	0.0
25-34	2.8	-0.1	3.8	0.0
35-44	0.1	0.0	2.9	0.0
45-54	2.0	0.0	0.2	0.0
55-64	3.1	0.0	2.1	0.0
65+	2.4	0.0	2.4	0.0
Labour force	3.1	-0.1	2.7	0.0
Primary (men 25-54)	1.8	-0.1	2.5	0.0
Secondary	4.2	-0.2	2.8	0.1
Men 14-24	4.6	-0.2	0.5	0.0
Men 55+	1.2	0.0	1.3	0.0
Women under 35	6.3	-0.3	4.6	0.1
Women over 35	3.7	-0.1	3.5	0.1
Employment	2.8	-0.2	2.9	0.1

**Table B-11**  
**Industrial Patterns of Growth, 1975-82**

	Actual 1964-72	Projected 1975-82		
		A-B	B	C-B
	(Average annual percentage change)			
Agriculture				
Output	1.6	-0.1	4.1	0.0
Employment	-2.8	0.2	-2.4	-0.1
Output per man-hour	5.1	-0.1	6.5	0.0
Capital stock	1.9	-0.1	4.3	0.0
Forestry				
Output	1.0	-0.1	5.2	0.1
Employment	-1.4	-0.2	1.2	0.1
Output per man-hour	-2.7	0.0	5.3	0.0
Capital stock	4.3	-0.1	5.5	0.0
Fishing				
Output	-0.3	0.0	1.2	0.0
Employment	-2.5	0.0	0.2	0.0
Output per man-hour	3.1	0.0	2.2	0.0
Capital stock	4.5	-0.1	4.2	0.0
Mining, oil, and gas				
Output	5.8	-0.8	4.7	0.8
Employment	3.3	-0.6	-1.2	0.1
Output per man-hour	2.4	-0.2	6.5	0.6
Capital stock	8.7	-1.1	8.8	1.8
Manufacturing				
Output	4.9	-0.1	5.4	0.1
Employment	1.3	-0.2	1.4	0.1
Output per man-hour	3.9	0.0	4.4	0.0
Capital stock	5.3	-0.1	6.7	0.0
Construction				
Output	3.8	-0.4	5.4	0.2
Employment	1.4	-0.3	2.5	0.2
Output per man-hour	3.3	-0.2	3.5	0.1
Capital stock	3.1	-1.1	5.5	0.3
Utilities				
Output	8.4	-0.1	6.4	0.1
Employment	3.2	-0.1	-0.1	0.0
Output per man-hour	6.1	0.0	9.4	0.0
Capital stock	6.8	-0.1	8.4	0.0

(cont'd.)

Table B-11 (concl'd.)

	Actual	Projected 1975-82		
	1964-72	A-B	B	C-B
(Average annual percentage change)				
Transportation, storage, communications				
Output	6.2	-0.3	5.3	0.2
Employment	2.4	0.3	0.4	0.1
Output per man-hour	4.7	-0.6	5.7	0.1
Capital stock	3.5	-1.2	6.0	0.0
Trade				
Output	4.9	-0.2	5.0	0.1
Employment	2.9	-0.2	2.9	0.1
Output per man-hour	3.1	0.0	3.0	0.0
Capital stock	3.6	0.0	2.7	0.0
Finance				
Output	5.6	-0.2	5.4	0.1
Employment	4.9	-0.2	5.2	0.1
Output per man-hour	0.9	-0.1	-0.1	0.1
Capital stock	8.5	0.1	8.0	0.0
Services				
Output	6.0	-0.2	4.9	0.1
Employment	5.7	-0.3	5.0	0.1
Output per man-hour	1.3	0.1	0.7	0.0
Capital stock	8.6	-0.1	7.3	0.0
Public administration				
Output	3.3	-0.1	4.0	0.1
Employment	4.6	-0.1	4.2	0.1
Output per man-hour	-0.5	-0.1	0.8	0.0
Total economy				
Output	5.1	-0.2	5.1	0.1
Employment	2.8	-0.2	2.9	0.1
Output per man-hour	3.2	-0.1	3.0	0.1
Capital stock	5.3	-0.4	6.8	0.2



**Table B-12**  
**Personal Disposable Income, 1975-82**

	Actual 1964-72	Projected 1975-82		
		A-B	B	C-B
		(Average annual percentage change in current dollars)		
Wages, salaries, supplementary labour income, and military pay	10.2	-0.4	11.1	0.3
Net farm income	0.5	-0.5	6.8	0.4
Net income of nonfarm unincorporated business	7.2	-0.3	6.3	0.1
Interest, dividends, and miscellaneous investment income	9.6	-0.5	8.1	-0.3
Current transfers from government	16.1	0.0	8.5	0.0
Transfer payments to persons	16.1	0.0	8.5	0.0
Capital assistance	15.6	0.0	0.0	0.0
Current transfers from corporations	5.7	0.0	3.1	0.0
Current transfers from nonresidents	6.6	0.0	3.4	0.0
Personal income	10.2	-0.4	10.2	0.2
less				
Income taxes	18.8	-0.4	13.3	0.2
Contributions to social security	12.2	-0.1	9.2	0.1
Other transfers from persons	17.4	0.0	8.0	0.0
Personal disposable income	8.9	-0.4	9.6	0.2
Real personal disposable income	5.2	-0.2	5.4	0.1
Real personal disposable income per capita	3.6	-0.1	4.0	0.0

**Table B-13**  
**Industry and Final Demand Prices, 1975-82**

	Actual	Projected 1975-82		
	1964-72	A-B	B	C-B
		(Average annual percentage change)		
Final demand price deflators				
Consumer expenditure on goods and services	3.4	-0.2	4.1	0.1
Business investment in machinery and equipment	2.2	-0.1	4.0	0.1
Business investment in non-residential construction	4.7	-0.3	5.1	0.2
Residential construction	4.5	-0.4	5.7	0.2
Government fixed capital formation	3.7	-0.3	5.0	0.2
Government current expenditures on goods and services	6.5	-0.3	6.9	0.2
Exports of goods and services	2.5	0.0	2.6	0.2
Imports of goods and services	2.2	0.0	3.6	0.0
GNE price deflator	4.0	-0.3	4.6	0.2
Industry prices				
Agriculture	1.9	-0.5	3.2	0.3
Forestry	3.5	-0.4	3.1	0.3
Fishing	5.4	-0.3	6.2	0.2
Mining	1.4	0.0	3.1	0.0
Manufacturing	2.2	-0.1	4.2	0.0
Construction	5.5	-0.6	7.0	0.3
Transportation	n.c.	0.1	4.4	0.1
Utilities	1.7	-0.1	5.1	0.1
Trade	n.c.	-0.3	4.7	0.2
Finance	3.7	-0.2	5.8	0.1
Housing	2.4	-0.2	4.5	0.1
Services	6.8	-0.3	5.7	0.1
Public administration and defence	7.4	-0.4	8.3	0.2
Total economy	3.9	-0.2	5.0	0.1

n.c. = not calculated.

## APPENDIX C

### SELECTED EXTERNAL STATISTICS

**Table C-1**

**Total Canadian Merchandise Exports and Imports, by Country, 1968-73**

	1968	1969	1970	1971	1972	1973
(Billions of dollars)						
<b>Exports</b>						
Total <sup>1</sup>	13.62	14.93	16.82	17.80	19.98	25.21
(Percentage distribution)						
United States	67.7	71.1	64.9	67.5	69.7	67.7
Western Europe	16.7	15.2	18.5	16.4	14.2	14.5
Japan	4.5	4.2	4.8	4.7	4.8	7.1
Other industrial countries	2.1	1.9	2.0	1.6	1.2	1.3
Developing countries	6.7	6.5	7.9	7.6	6.9	6.6
Eastern Europe and China	2.3	1.1	1.9	2.2	3.2	2.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
(Billions of dollars)						
<b>Imports</b>						
Total	12.36	14.13	13.95	15.62	18.67	23.32
(Percentage distribution)						
United States	73.2	72.5	71.1	70.1	69.0	70.7
Western Europe	13.4	13.7	14.0	14.1	14.1	13.1
Japan	2.9	3.5	4.2	5.1	5.7	4.4
Other industrial countries	1.1	1.3	1.7	1.5	1.6	1.7
Developing countries	8.6	8.2	8.4	8.5	8.8	9.3
Eastern Europe and China	0.8	0.8	0.7	0.7	0.8	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

<sup>1</sup> Includes re-exports.

SOURCE Based on data from Statistics Canada, *Trade of Canada*.

**Table C-2**  
**Distribution of Canadian Exports and Imports, by Country, 1973**

	United States	Seven EEC Countries <sup>1</sup>	Japan	Other	Total	Value (millions of dollars)
(Millions of dollars)						
<b>Exports<sup>2</sup></b>						
Value	16,607	3,070	1,794	3,173		24,598
(Percentage distribution)						
Farm and fish products	31.2	18.8	13.3	36.7	100.0	3,144
Crude materials	54.6	16.9	19.6	8.9	100.0	5,007
Fabricated materials	69.6	15.5	4.4	10.5	100.0	8,187
Highly manufac- tured products	86.7	4.4	0.4	8.5	100.0	8,260
Total <sup>3</sup>	67.4	12.4	7.3	12.9	100.0	
(Millions of dollars)						
<b>Imports</b>						
Value	16,497	2,398	1,018	3,404		23,070
(Percentage distribution)						
Farm and fish products	50.1	10.1	1.9	37.9	100.0	1,981
Crude materials	38.8	2.3	0.1	58.8	100.0	2,011
Fabricated materials	66.0	14.6	5.5	13.9	100.0	4,280
Highly manufac- tured products	79.1	10.1	5.0	5.8	100.0	14,798
Total <sup>3</sup>	70.7	10.3	4.4	14.6	100.0	

<sup>1</sup> The original six EEC countries and the United Kingdom.

<sup>2</sup> Domestic exports. Do not include re-exports.

<sup>3</sup> Includes special transactions not shown separately.

SOURCE Based on data from Statistics Canada, *Trade of Canada*.

**Table C-3**  
**Distribution of Canadian Merchandise Exports<sup>1</sup>, in Current**  
**and Constant Dollars, by Product Group, 1968-73**

	1968	1969	1970	1971	1972	1973
	(Millions of dollars)					
<b>Exports in current dollars</b>	13,251	14,504	16,401	17,380	19,500	24,644
	(Percentage distribution)					
Farm and fish products	12.2	10.1	11.4	12.2	11.9	12.8
Crude materials	18.6	17.0	18.7	18.7	18.2	20.3
Fabricated materials	36.6	35.6	35.8	33.4	33.5	33.2
Auto products	19.8	23.7	20.9	23.9	23.4	21.5
Other highly manufactured products	12.5	13.4	13.0	11.7	12.8	12.0
Total <sup>2</sup>	100.0	100.0	100.0	100.0	100.0	100.0
	(Millions of dollars)					
<b>Exports in 1968 constant dollars</b>	13,251	14,154	15,630	16,584	18,087	19,990
	(Percentage distribution)					
Farm and fish products	12.2	10.5	12.8	13.3	12.7	11.5
Crude materials	18.6	17.1	18.3	18.6	18.3	19.9
Fabricated materials	36.6	34.7	34.4	32.7	32.7	31.4
Auto products	19.8	24.0	21.3	23.8	23.5	23.9
Other highly manufactured products	12.5	13.4	13.0	11.4	12.6	13.1
Total <sup>2</sup>	100.0	100.0	100.0	100.0	100.0	100.0

1 Domestic exports. Do not include re-exports.

2 Includes special transactions not shown separately.

SOURCE Based on data from Statistics Canada, *Trade of Canada*.



**Table C-4**  
**Distribution of Imports, in Current and Constant Dollars,**  
**by Product Group, 1968-73**

	1968	1969	1970	1971	1972	1973
(Millions of dollars)						
<b>Imports in current dollars</b>	12,358	14,130	13,952	15,617	18,668	23,317
(Percentage distribution)						
Farm and fish products	7.4	7.5	8.0	7.4	7.5	8.5
Crude materials	9.1	7.7	8.4	8.5	8.2	8.6
Fabricated materials	19.7	20.6	20.7	20.1	19.2	18.4
Automotive products	24.3	25.3	23.2	26.3	26.7	26.1
Other highly manufactured products	37.4	37.6	38.5	36.6	37.3	37.4
Total <sup>1</sup>	100.0	100.0	100.0	100.0	100.0	100.0
(Millions of dollars)						
<b>Imports in 1968 constant dollars</b>	12,358	13,733	13,377	14,734	17,080	19,431
(Percentage distribution)						
Farm and fish products	7.4	7.4	7.4	6.9	6.6	6.4
Crude materials	9.1	7.8	8.5	8.5	7.9	7.5
Fabricated materials	19.7	21.0	21.2	20.7	20.0	18.2
Automotive products	24.3	25.0	23.2	26.5	26.8	27.2
Other highly manufactured products	37.4	37.4	38.6	36.4	37.7	39.6
Total <sup>1</sup>	100.0	100.0	100.0	100.0	100.0	100.0

<sup>1</sup> Includes special transactions, not shown separately.

SOURCE Based on data from Statistics Canada, *Trade of Canada*.

Table C-5

**Domestic Exports of Automotive and Other Highly Manufactured Products,  
by Major Country Group, 1968-73**

	1968	1969	1970	1971	1972	1973
(Millions of dollars)						
Automotive products						
To the United States	2,407	3,232	3,191	3,949	4,361	5,121
To other countries	210	206	239	205	204	172
Subtotal	2,617	3,438	3,429	4,155	4,565	5,293
Other highly manufactured products						
To the United States	1,222	1,468	1,477	1,404	1,740	2,038
To other countries	438	472	660	635	781	928
Subtotal	1,660	1,940	2,138	2,038	2,521	2,967
Sum of the two groups						
To the United States	3,629	4,700	4,668	5,353	6,101	7,158
To the world	648	678	899	840	985	1,102
Total	4,277	5,378	5,567	6,193	7,086	8,260
(Percentage distribution)						
Automotive products						
To the United States	56.3	60.1	57.3	63.8	61.5	62.0
To other countries	4.9	3.8	4.3	3.3	2.9	2.1
Subtotal	61.2	63.9	61.6	67.1	64.4	64.1
Other highly manufactured products						
To the United States	28.6	27.3	26.5	22.6	24.6	24.7
To other countries	10.2	8.8	11.9	10.3	11.0	11.2
Subtotal	38.8	36.1	38.4	32.9	35.6	35.9
Sum of the two groups						
To the United States	84.9	87.4	83.9	86.4	86.1	86.7
To other countries	15.1	12.6	16.1	13.6	13.9	13.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

NOTE Detail may not add up because of rounding.

SOURCE Based on data from Statistics Canada, *Trade of Canada*.

**Table C-6**  
**Imports of Automotive and Other Highly Manufactured Products,**  
**by Major Country Group, 1968-73**

	1968	1969	1970	1971	1972	1973
(Millions of dollars)						
Automotive products						
From the United States	2,761	3,222	2,886	3,616	4,342	5,474
From other countries	240	348	353	494	645	601
Subtotal	3,001	3,570	3,239	4,110	4,987	6,075
Other highly manufactured products						
From the United States	3,483	3,985	3,946	4,117	4,851	6,236
From other countries	1,136	1,330	1,433	1,604	2,108	2,487
Subtotal	4,619	5,315	5,379	5,721	6,959	8,723
Sum of the two groups						
From the United States	6,244	7,207	6,832	7,733	9,193	11,710
From other countries	1,376	1,678	1,786	2,098	2,753	3,088
Total	7,620	8,885	8,618	9,831	11,946	14,798
(Percentage distribution)						
Automotive products						
From the United States	36.2	36.3	33.5	36.8	36.3	37.0
From other countries	3.2	3.9	4.1	5.0	5.4	4.1
Subtotal	39.4	40.2	37.6	41.8	41.7	41.1
Other highly manufactured products						
From the United States	45.7	44.8	45.8	41.9	40.6	42.1
From other countries	14.9	15.0	16.6	16.3	17.7	16.8
Subtotal	60.6	59.8	62.4	58.2	58.3	58.9
Sum of the two groups						
From the United States	81.9	81.1	79.3	78.7	77.0	79.1
From other countries	18.1	18.9	20.7	21.3	23.0	20.9
Total	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE Based on data from Statistics Canada, *Trade of Canada*.

Table C-7  
Foreign Exchange Rates in Terms of the Canadian Dollar, 1966-73

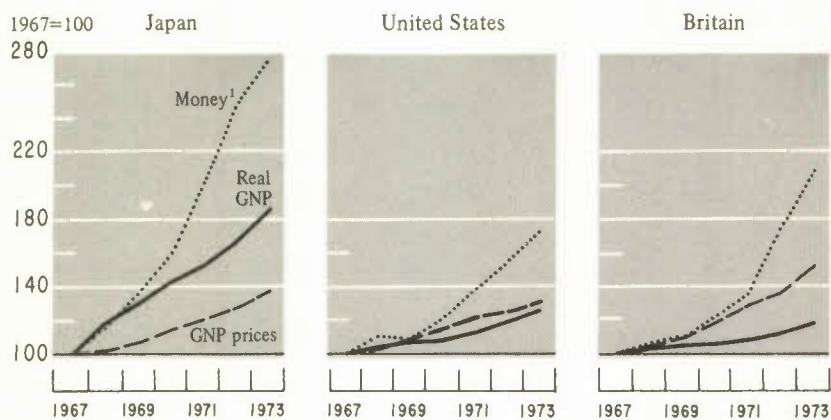
	1966	1967	1968	1969	1970	1971	1972	1973
	(Average annual spot rates)							
U.S. dollar	1.0773	1.0787	1.0775	1.0768	1.0440	1.0098	0.9905	1.0001
British pound	3.0090	2.9685	2.5794	2.5739	2.5016	2.4687	2.4797	2.4533
Japanese yen	.002975	.002979	.002989	.003005	.002916	.002912	.003270	.003696
German mark	.2694	.2706	.2699	.2746	.2863	.2900	.3108	.3782
French franc	.2193	.2193	.2176	.2078	.1889	.1883	.1965	.2257
Italian lira	.00173	.00173	.00173	.00172	.00168	.00170	.00170	.00167
	(Index: 1971 = 100)							
U.S. dollar	106.7	106.8	106.7	106.6	103.4	100.0	98.1	99.0
British pound	121.9	120.1	104.5	104.3	101.3	100.0	100.5	99.5
Japanese yen	102.2	102.3	102.6	103.2	100.1	100.0	112.3	126.9
German mark	92.9	93.3	93.1	94.7	98.7	100.0	107.2	130.4
French franc	116.5	116.5	115.6	110.4	100.3	100.0	104.4	119.7
Italian lira	101.8	101.8	101.8	101.2	98.8	100.0	100.0	98.2
Weighted average of the five overseas indexes <sup>1</sup>	112.8	111.3	103.1	103.0	100.5	100.0	105.9	115.7

1 Currently weighted averages of the British, Japanese, German, French, and Italian indexes. The weights are based on total two-way Canadian trade with the five countries. The reason for current weighting is essentially that Britain is falling sharply in importance as a trading partner, and Japan is rising.

SOURCE Based on data from the Bank of Canada and Statistics Canada.

Chart C-1

Indexes of Money, Real Gross National Product, and GNP Prices,  
Japan, United States, and Britain, 1967-73



1 Money plus quasi-money, as defined by the International Monetary Fund: currency, demand deposits, and short-term obligations of banks and governments.

SOURCE Based on data from the International Monetary Fund, the Japan Economic Research Center, the U.S. Department of Commerce, and the National Institute of Economic and Social Research.



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