

Economic Council of Canada

a climate of uncertainty

Seventeenth Annual Review



HC
111
.E26
n.17

c.1
tor mai

1980

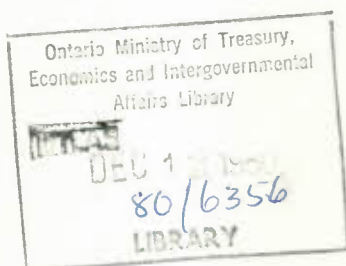
A Climate of Uncertainty

ECONOMIC COUNCIL OF CANADA

Seventeenth Annual Review

A Climate of Uncertainty

1980



© Minister of Supply and Services Canada 1980 ✓

Available in Canada through

Authorized Bookstore Agents
and other bookstores

or by mail from

Canadian Government Publishing Centre
Supply and Services Canada
Hull, Quebec, Canada K1A 0S9

Catalogue No. EC21-1/1980E
ISBN 0-660-10695-7

Canada: \$8.75
Other Countries: \$10.50

Price subject to change without notice

CAN.
EC21-
1/
1980

Contents

<i>Members of the Economic Council of Canada</i>	vii
Preface	ix
1 Leaving the Seventies	1
The Policy Record	2
The Performance Record	7
Conclusions	23
2 Facing the Eighties	25
The Reference Cases	25
The Effect of the Worsened External Environment	30
The Risk of Higher Inflation	36
The Domestic Oil Pricing Issue Revisited	37
The Impact of Investment	44
Potential Output	49
Conclusions	55
3 The Federal Deficit	59
Federal Deficits and Foreign Indebtedness	64
Federal Deficits and Economic Performance	67
Politics and Fiscal Disparities	74
Conclusions	76
4 The Productivity Puzzle	79
5 Explaining the Productivity Slowdown	87
Productivity Growth by Industry	88
Influences on Productivity Performance	93
Conclusions	103
6 The Regional Picture	105
The Pattern of Productivity Slowdown	105
The Reasons for the Productivity Slowdown	110
Regional Differences in Productivity in the Service Sector	111
Productivity and the Spread of New Technology	117
Conclusions	120

7 Conclusions and Recommendations	123
Increasing the Available Resources	124
More Efficient Combination of Resources	134
The Utilization of Capacity	136
Distributive and Institutional Obstacles	138
Conclusions	143
Supplementary Statement by James A. McCambly	144
Appendixes	147
A External Environment Assumptions and their Effects on Selected Indicators	148
B Fiscal Positions and the Effects of Selected Fiscal Actions	151
C Estimating the Effects of Factors Influencing Productivity	153
D Measuring Provincial Productivity Differences Among Physi- cians	163
Notes	165
List of Tables	167
List of Charts	168
Acknowledgement	171

This report reflects a consensus of the Economic Council of Canada. A supplementary statement by Mr. McCambly appears at the end of Chapter 7.

Members of the Economic Council of Canada

DAVID W. SLATER, Chairman

HARRY W. ARTHURS, Professor, Osgoode Hall Law School, York University, Downsview

IAN A. BARCLAY, Chairman of the Board, British Columbia Forest Products Limited, Vancouver

DAVID BLAIR, Vice-President, Atlantic Region, Canadian National Railways, Moncton

NORMAN A. BROMBERGER, General Manager and Chief Executive Officer, Saskatchewan Co-operative Credit Society, Regina

ROBERT B. BRYCE, Retired public servant, Ottawa

WILLIAM A. DIMMA, President, A. E. LePage Limited, Toronto

MILDRED S. DOBRIN, Vice-President and General Manager, Miracle Mart, Montreal

NICOLLE FORGET, Student, Faculty of Law, Université de Montréal, Montreal

KALMEN KAPLANSKY, Labour Consultant, Former Director, Canadian Branch Office, International Labour Office, Ottawa

PIERRE LAURIN, Director, École des Hautes Études Commerciales, Montreal

H. IAN MACDONALD, President, York University, Downsview

JAMES A. MCCAMBLY, Executive Secretary, Canadian Office, Building and Construction Trades Dept., AFL/CIO, Ottawa

PETER H. PEARSE, Professor, Department of Economics, University of British Columbia, Vancouver

J. HUGH STEVENS, Chairman and Chief Executive, Canada Wire and Cable Company Limited, Toronto

RALPH G. M. SULTAN, Senior Vice-President, The Royal Bank of Canada, Calgary

READER'S NOTE

Notes to the text may be found at the back of this Review, after the appendixes. The reader should also note that various conventional symbols have been used in the tables, similar to those used by Statistics Canada.

- . . figures not available
- - amount too small to be expressed
- nil or zero

Preface

This Review was completed by the Council just before the Budget and the National Energy Message were brought down. The Council as a whole takes responsibility for the Review. To carry out the Council's direction from its mid-September meeting, and to negotiate final Council approval takes a little more than a month after that meeting. Final translation, publication and distribution in both official languages takes about another month after Council sign off, accounting for the publication of the Review some weeks after the Budget.

No attempt has been made to alter the Review in the light of the Budget and National Energy Program. To have done so would have delayed publication of the Review by some further weeks rather than some days. It is preferable that the Review be available in the period during which economic policy is under the post-budgetary public review and legislative scrutiny. In the Review and in supporting materials made available with the Review, the Council has provided simulations of the main economic indicators through the 1980's for a wide range of possibilities of events and policies. These simulations cover in one way or another all of the main features of both the budget and the national energy program, except for the Canadian and governmental ownership of much enlarged shares of the oil and gas industry in Canada. The consequences of a set of options in oil and gas prices, energy revenue sharing, investment and export developments, fiscal policies, monetary policies, and inflationary behaviour in Canada are laid out. By combining these options, an independent view can be obtained of most of the consequences of the Budget and the National Energy Program, save for the policies concerning ownership of the oil and gas industry.

It should be added that the Review contains a special feature, over and beyond the macro-economic and energy analysis. This is a stocktaking on productivity – meaning, measurement, explanation of trends, consequences and suggestions for improvements. This is in itself, a substantial preface to work in progress at the Council.

1 Leaving the Seventies

Canada is a remarkably favoured country. Its standard of living remains among the highest in the world. It has abundant natural resources and, unlike most other industrial nations, the ability to supply its future energy requirements from domestic sources. It has a skilled and increasingly educated labour force, a high level of domestic savings, and a large stock of physical capital. And, although some serious shortcomings remain, it has recorded substantial achievements in many areas of social policy with its programs to provide health care and assistance to families, older people, and disadvantaged groups.

But the past year has not been an auspicious one for the Canadian economy. The pervasive problems of inflation, government and trade deficits, unemployment, and slower growth examined by the Economic Council in its Sixteenth Annual Review have not only persisted, in many cases they have also deepened. In part, this deterioration reflects the worsened economic performance of this country's major trading partners. But it also reflects the indecision and the increased uncertainty surrounding domestic policy on several important issues.

That there is uncertainty is not surprising. Our problems cannot be remedied easily. As we noted last year, there is no one set of policies that will bring improvement in all of the key areas. For example, some policy packages would improve real growth or price performance, but at the same time increase the deficit in the current account balance of international payments or the already very large federal deficit; others would reduce these deficits, but would worsen performance in other areas. In these circumstances, the immediate question for economic policy-makers boils down to what can be done to get through the difficult period that lies ahead.

This is not an easy question. Its resolution will require a careful examination of the elements that are contributing to the difficulties this country now faces. It will also require a careful stock-taking of the sources of future economic growth, for the potential for increasing output is lower now than in the 1960s and early 1970s. And, indeed, the

2 A Climate of Uncertainty

Canadian economy is not now even performing at this more slowly growing potential. We must attempt to show how the Canadian economy can once more perform at capacity and how the level of potential growth and output can be raised.

This Review is in many ways only an interim report on progress towards achieving these goals. However, the new lines of work that we have undertaken, especially on the sources of productivity growth, have already helped to narrow the search for guidelines to future policy. This Review sets out some of these guidelines in its analysis of performance and of the productivity slowdown. It also shows that other serious and long-lasting problems exist in Canada and elsewhere, such as inflation, high unemployment, and continuing energy price rises, and that they exist independently of the difficulties created by the present recession; that the tackling of the growth problem is being delayed by slowness in coming to grips with structural and distributional issues, especially in connection with oil and gas pricing. In addition, it examines the large persistent federal deficits in relation to our economic difficulties.

In effect, Chapters 1, 2, and 3 comprise the performance analysis. The rest of this chapter highlights several aspects of economic performance in Canada and abroad in the recent period with a view to establishing how the Canadian economy is adapting to domestic and international forces of change. Chapter 2 builds on these highlights and, with the use of the CANDIDE econometric model, sets Canada's economic problems in a medium-term perspective, showing how the present situation, or possible changes in it, will affect economic growth and development. Chapter 3 explores the implications of various approaches to reducing the federal deficit.

Chapters 4, 5, and 6 focus more directly on the lack of growth in productivity. Chapter 4 introduces the subject by discussing the nature and importance of productivity growth and the complexity of the problems of measuring productivity. Chapter 5 draws on new work at the Council and elsewhere to analyse the recent decline in productivity growth, and focuses on distinguishing transitory from longer-run influences on this growth. It discusses some of the future possibilities for Canadian productivity growth and indicates how ongoing work at the Council will help to fill the still great gaps in the knowledge required in the development of appropriate policies. Chapter 6 looks at our work on regional productivity to see whether its results are consistent with the explanations for the productivity slowdown set out in Chapter 5. Chapter 7 summarizes the problems and prospects for real income growth and sets out a number of guidelines and recommendations for future policy.

The Policy Record

Over the last six or seven years, the world has had to cope with major alterations in the international economy. A number of these recent

developments and the immediate prospects in the world economy are unfavourable to Canada. The recession in the United States, the slowdown in growth in western Europe and Japan, the massive further increases in 1979 and 1980 in the price of oil from the OPEC nations, and the accompanying changing nature of demand for automobiles are all contributing to the slowdown at home. The unattractive developments inherited from the 1970s, such as the entrenchment of inflation and inflationary expectations and weaker productivity growth both here and abroad, are also causing problems in Canada. And finally, the necessity of dealing with the consequences of postponed or incomplete adjustment to underlying changes, most notably in energy use, fiscal arrangements, industrial structure, and in our trade and our balance of payments is upon us.

Against this background, international attention this year has been caught by the enormous importance of reducing dependency on imported oil and of fighting inflation rather than short-term output and unemployment problems. The developing non-oil exporting countries particularly are also wrestling with the problem of how to overcome their international payments imbalances and accumulating debt. Another dominant question is the priority that should be accorded to reducing the rate of public and private consumption in order to achieve investment growth. Finally, the necessity of countering the possibility of a re-emergence of protectionism is much on the minds of policy-makers in many countries.

How Canada and some OECD countries have adjusted their monetary, fiscal, and energy policies in response to these problems is discussed briefly in this chapter. It concludes with a review of the economic performance achieved on the basis of these policies.

ENERGY POLICY

Energy policy is dominated by the international price for oil, which was increased drastically in 1973 and again in 1980 after a series of smaller hikes. Some countries, notably the United States and Canada, attempted to accommodate the first oil price rise through financial arrangements rather than through adjustments to their consumption and production patterns. This was only partially successful. Those countries that made fundamental adjustments to the changed energy supply conditions by raising the domestic oil price to the world level have been able to enter the 1980s in more favourable circumstances than those that did not. Those countries that did not adjust to the earlier oil price increases now may find themselves doubly cursed. Eventually they must adjust and absorb the higher costs. In the meantime the costs associated with not adjusting and with the accompanying uncertainty may approach the costs of accommodating the changes.

Countries that are heavily dependent upon oil imports, such as Japan and Italy and less so France and Germany, had little choice but to absorb the price increases imposed by the exporters. The price of oil for space heating and industry has increased in line with world rates in all these countries. The price of refined oil products for transportation increased rather less rapidly. Except for Italy, these countries have maintained productivity and output growth rates that are high relative to the average attained in the other major seven countries in the OECD. Britain's overall economic performance has been rather dismal, though its dependence on imports has fallen sharply since North Sea Oil began to flow. The United States has recently decided to raise domestic prices to reach world prices by 1981.

Canada has been clearly out of step with the other industrialized countries. While the world price for oil has quadrupled since 1973, the price in Canada has little more than doubled. However, even though the increases in domestic energy prices have been smaller in Canada than in any of the industrialized countries, they have, to some extent, depressed Canadian incomes in the short run compared with what they might otherwise have been. But since Canada has postponed the adjustment to energy price increases, most of the economic problems of accommodating the changes lie ahead.

While the implications of the energy supply and the failure to adjust and the uncertainty of the world price now and in the future are now well recognized, when this Review was being prepared Canada's energy policy was still not clear. No explicit agreement has been reached on national energy price increases, though the August hike of \$2 per barrel at the wellhead instituted by Alberta has not been challenged by the federal government. Decisions have, however, been taken to allow increased natural gas exports and the pre-build of the southern section of the Alaska pipeline project and to maintain the Syncrude levy designed to ensure near world prices for oil sands output. Our economic projections for the 1980s reflect these circumstances. Otherwise, the inventory of policy decisions required is virtually the same as that facing Canadians a year ago. We still need agreement on the rate of oil and other energy price increases; resolution of adjustments to the sharing of windfall profits from energy production that are generated by increased world energy prices; settlement of land claims; and clear delineation of jurisdiction over offshore mineral rights.

MONETARY POLICY

In the late 1960s and early 1970s, many analysts and policy-makers worried about the possible inadequacy of world liquidity, given the imminent decline of the dollar as the foundation of international trade. Now their concern is directed more towards international credit condi-

tions and the unchecked tendency for the quantity of money and credit to increase. During the last five years, increasing attention has been paid to the role of money and credit generally and the rate of growth in the money supply in determining the course of inflation, the behaviour of exchange rates, and adjustments in international balances. With the development of new financial instruments, it is now generally agreed that previous judgments based on movements in the narrowly defined monetary aggregates underestimated the ease of monetary and credit conditions. Rapid development of Eurocurrency markets may also have provided much greater liquidity than was expected from the traditional financial markets. The international mobility of liquid balances and their sensitivity to political considerations may undermine the stability of the exchange rate system. Further, in many circumstances, the ability of a national central banking authority to control the amount of credit within its jurisdiction may also be reduced. These changes in international money and credit conditions have obviously contributed to worldwide inflation.

In the United States the measured inflation rate – as judged by the CPI – shot up, leading to widespread worries about marked acceleration in the underlying rate of inflation and fears of a weakening dollar. One of the big surprises in the last year was the extraordinarily large surge – and then fall – in interest rates in the United States. The U.S. economic expansion carried on longer and was stronger in 1979 than was expected, largely driven by extraordinary increases in consumer spending and decreases in personal savings rates. The expansion in the demand for credit and the vigour of expenditure that turned out to be possible on the basis of a fairly moderate expansion of the domestic money supply were unusually large. The restrictive actions taken in late October, mainly under the aegis of the Federal Reserve System, were not immediately reassuring, and the President's first budget submission was not considered restrictive enough to brake the acceleration of inflation. New monetary, credit, and fiscal steps, taken in March, led to the truly exceptional increase in interest rates. By mid-1980, the United States seemed to be in the midst of a strong recession. Still strong basic monetary restraint was continued, though the special credit restrictions were relaxed.

Over the past few years, Canadian monetary policy has been directed towards keeping the quantity of money in Canada within limits high enough to meet the needs of a growing economy, but not so high as to accommodate a continuation of inflation. Since 1975 the monetary targets have been gradually lowered with the objective of slowing the growth of aggregate demand. The target for the growth of the narrowly defined money supply – M-1 – is now in the range of 5 to 9 per cent annually. The cutting edge in the process of slowing down the growth in aggregate demand is interest rates, which are "determined by the interplay of economic developments and the rate at which the Bank of Canada permits monetary expansion in the country to proceed."¹ In 1979 the

Bank of Canada sought, within the framework of the monetary targets, "interest rate relationships between Canada and the United States that did not contribute to an acceleration of inflation in Canada through a further substantial decline in the external value of the Canadian dollar."²

This approach has been fairly successful in gradually reducing the rate of growth of the money supply. However, the extent to which it has produced the desired effect on inflation is not clear. With the extraordinary rates in the United States and strong domestic pressures, interest rates in Canada reached an unprecedented high in late 1979 and early 1980. In the hope of giving itself more flexibility to respond quickly to market rate adjustments resulting from pressures on the Canadian dollar, the Bank floated its lending rate in March 1980. The rate peaked in April and then began to fall back to the level of late 1978. The current situation indicates that further interest rate increases may be anticipated.

FISCAL POLICY

Among the OECD members, fiscal policy has recently been cautious and even deflationary. The economic impact of the oil price rise has led to higher government deficits, as ongoing stabilization measures cause the rate of growth in revenues to fall as social security payments rise. Most OECD countries have also adopted restrictive discretionary measures, mainly to counteract inflation and in some cases to achieve a budget position that is more compatible with their monetary targets.

In Canada in the mid-1970s, the federal and provincial governments directed their ongoing fiscal policies and their discretionary actions—such as changes in expenditure or tax programs that alter ongoing policies—towards increasing expenditures and maintaining output and employment. Faced with international and domestic recessionary forces, the federal government chose to apply a large stimulus, pursuing a more rigorous counter-cyclical fiscal policy than other industrialized countries. But by the late 1970s, as inflation continued to be worrisome, the general drift of fiscal policy was to slow or reverse that fiscal stimulus, and all governments reduced the growth rate in their discretionary expenditures, though ongoing programs continued to expand. In the last couple of years, these changes have tended to slow the growth in private after tax incomes.

One result of such a policy has been the emergence of a large and intractable federal government deficit. At the same time, British Columbia and Alberta have amassed surpluses. The varied fiscal strengths and weaknesses of the other governments in Canada were highlighted in the Sixteenth Annual Review. Another year has reinforced the Council's concern with this fiscal disparity in Canada. While over forty per cent of the current federal government deficit could be elimi-

nated if the economy were functioning at close to potential, the existence of a disparity between the federal government and other governments under conditions of high unemployment would remain a concern. The disparity does not simply occur because governments have failed to raise or lower a few taxes; rather it reflects some deeply rooted features of the fiscal system. As a result the federal government is short of revenue and possible new sources of revenue that would help redress the balance.

With the existing energy pricing regime and the current fiscal arrangements, the federal government has large and entrenched expenditure commitments to individual Canadians and to Canadian provinces. Most of them are transfers, which by formula or custom rise when economic growth is slow and inflation is increasing. Such federal commitments place burdens on the federal treasury and debt management capabilities. Additional arrangements to subsidize energy imports are currently aggravating the fiscal disparity. The structural features of the federal government revenue system, particularly the indexation of personal income tax, has reduced its ability to increase federal revenues enough to cover the growing expenses of established programs. Without some changes in structure, as well as changes in fiscal policy, it is difficult to foresee a fundamental change in Canada's fiscal position.

The Performance Record

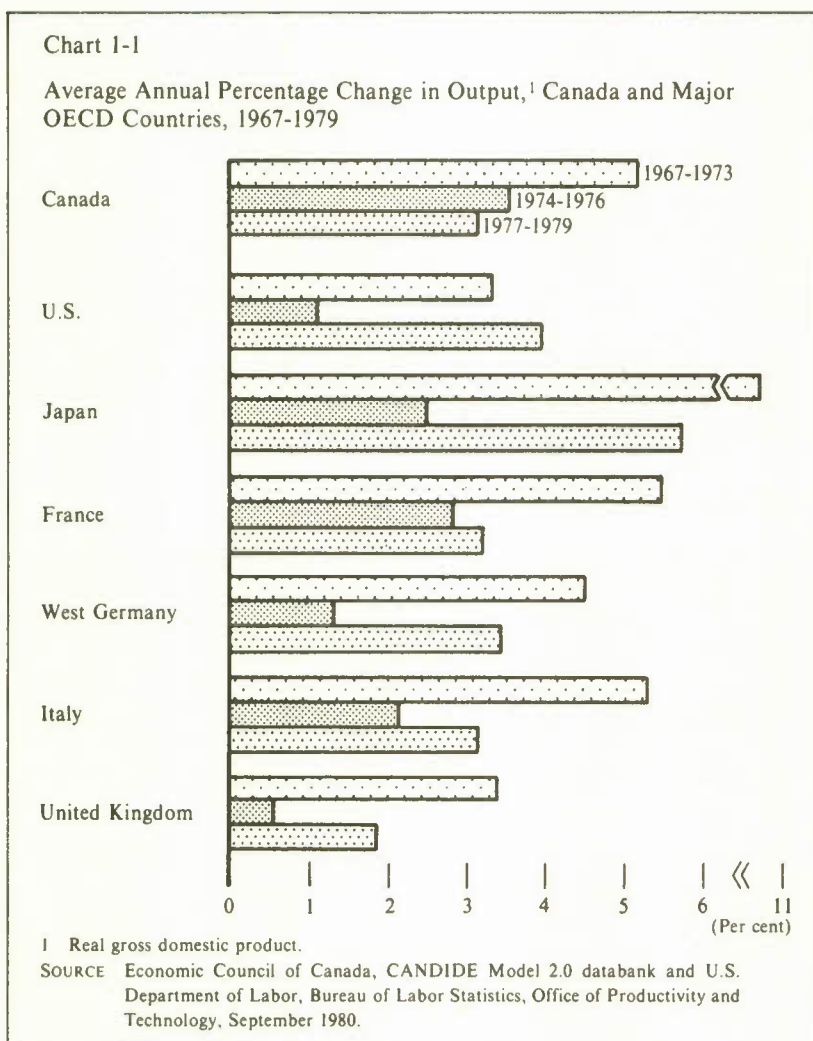
As 1980 draws to a close, most industrialized countries are in the midst of adapting to major international and internal structural changes. Most of them are experiencing a continuation of high inflation and either decreases or unusually small increases in the rate of growth in productivity and real output. This section sketches the highlights of economic performance in the world and in Canada in order to establish a sense of how the Canadian economy is adapting to the international as well as domestic forces of change and to help identify where additional changes need to be made.

In this analysis of the performance of the Canadian economy, the Economic Council has concentrated on the record in the period since mid-1976. By then, the process of recovery from the first huge OPEC oil price jump, the worldwide price explosion for food and materials, and the extraordinary acceleration of inflation was underway. But this recovery has been characterized by low output growth and a lower rate of growth in productivity than in the period before 1974 when industrialized countries were overcoming the slowdown in 1970, as becomes clear from our brief look at selected economic indicators.

REAL GROWTH

Real output growth in the OECD countries was slower in the second half of the 1970s than in the early years of the decade (Chart 1-1). By

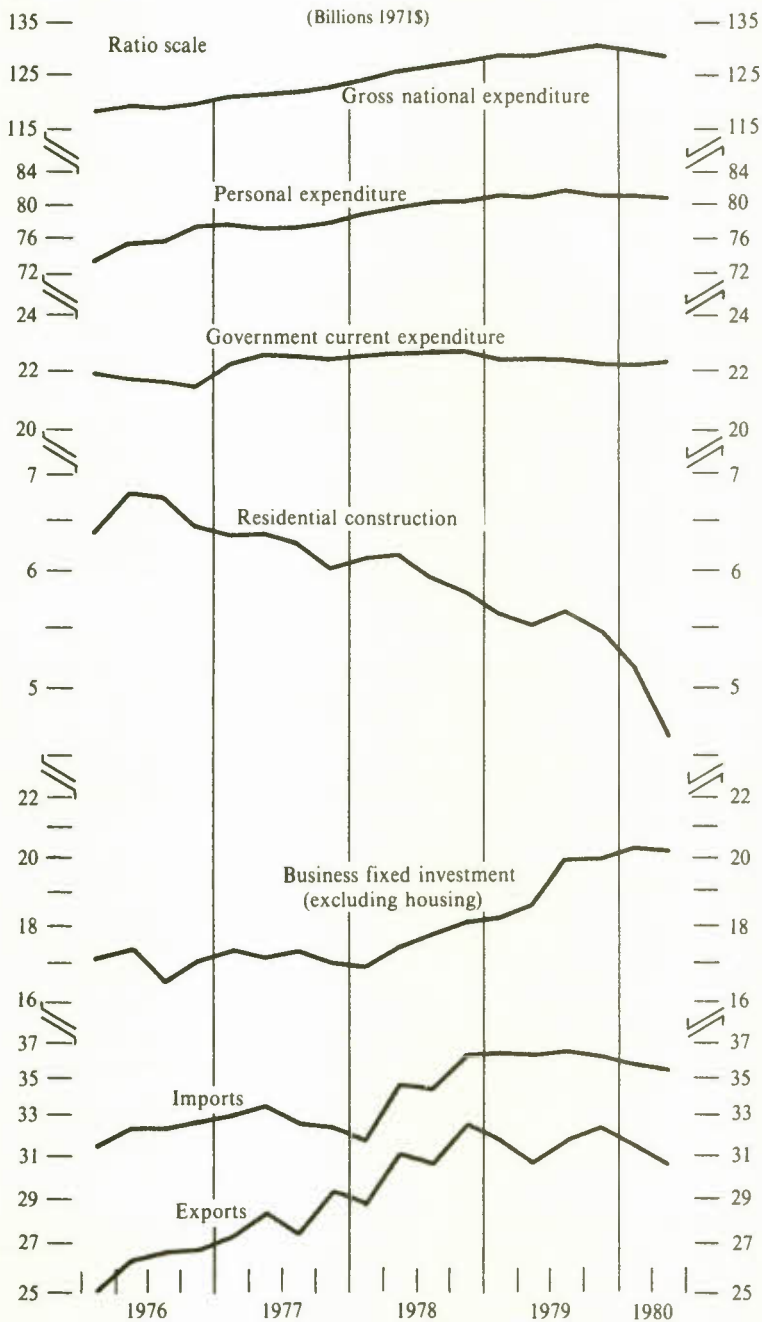
the first half of 1980, the United States was clearly in a recession. But, except for the United Kingdom, which has been influenced by exceptional policy measures, growth in output remained positive in western Europe and Japan well into 1980.



In Canada real gross national expenditure (GNE) increased in absolute terms until the first quarter of 1980, but at a slow and decelerating rate. Indeed, by the end of 1979, many of the classic signs of a recession had appeared in many of the components of GNE (Chart 1-2).

Chart 1-2

Selected Components of Gross National Expenditure in Canada,
Seasonally Adjusted at Annual Rates, First Quarter 1976 to Second
Quarter 1980



SOURCE Based on data from Statistics Canada.

During 1975-76 real consumer expenditures acted as a driving force on the Canadian economy by growing faster than real GNE. Since 1978 they have fallen behind real aggregate growth, as wages are no longer keeping up with inflation. Nevertheless, some noteworthy changes in consumer expenditures indicate that the average consumer is reacting to price changes in a rational manner.

Spending on consumer durables, the most postponable group of consumer expenditure items, was stable up to the last quarter of 1979, helped by comparatively low price increases. Since then, however, low housing starts have impeded the demand for furniture and durable household equipment.

The oil price increase in December 1979 along with automobile price increases of around 11 per cent have led to a severe reduction in the demand for passenger cars. The automobile industry is not only affected by the current cyclical downturn, it is also confronted with structural problems as demand for small cars increases, and domestic plants are still tooled to make larger models. The extent of adjustment in this Canadian industry is indicated by the drop in employment to an estimated 97,000 from a peak of 118,000 in 1978. The American-owned automobile manufacturers are now undertaking large-scale investment in order to supply more fuel efficient cars, but employment is not expected to return to its former level for several years.

Purchases of semi-durable consumer goods, such as clothing, other textile goods, and footwear, grew vigorously in the 1975-78 period when price increases remained in the modest range of 4.5 to 6 per cent. When prices started increasing at a rate of 11 to 13 per cent early in 1979, buying slowed, and since mid-1979 real expenditures on semi-durables have been declining steadily.

Non-durable goods have been hit particularly heavily by price increases in recent years. Since 1976, when food prices showed a temporary decline, real consumer expenditures on food and non-alcoholic beverages have been slowly but steadily declining. The strong increase in fuel oil prices has resulted in a continuing decline in the purchase of fuels other than natural gas, and even the rise in the consumption of natural gas has been modest, despite the substantial number of conversions from oil to gas space heating. Similarly, the hike in gasoline prices, while modest by U.S. standards, has kept the increase in gasoline consumption well below the trend in the early 1970s.

Consumer expenditures on services have varied. Real rent imputed to owner-occupied housing grew at an unusually high rate, reflecting the trend to homeownership as a hedge against more firmly entrenched inflation. Real demand for financial and legal services has grown sub-

stantially. Strong increases in expenditures on recreational services suggests that more Canadians may take their holidays in Canada. Educational expenditures, which include the operational expenses of universities and private schools, have declined steadily since 1976 with declining enrolments and government restraint.

Real expenditure on imports tended to increase less quickly than expenditure on exports in 1977. Both posted large increases in 1978 and smaller increases or decreases thereafter. Relatively buoyant business investment has been bolstering spending on imports. Depressed demand in the United States for North American cars contributed to the deterioration in export sales during 1979 and the first half of 1980.

The federal government has exerted considerable and increasingly severe restraint in its current expenditures. Over the 1975-80 period this item grew marginally slower than real GNE. However, the wage-rate of federal employees still grew faster than did the average wage rate.

Provincial governments also restrained their expenditures during the period. However, they increased wages more than the federal government and almost 2 full percentage points more than the average wage increase. Local government spending was contained by declining school enrolment rates and the reduction in school staffs, though school wage and salary rates increased over 5 per cent more than the average wage rate gain.

Investment patterns through the period have been rather deceptive. From 1971 through the recession of 1974-75, growth in total gross fixed capital formation remained reasonably strong. Thereafter it slackened, becoming negative in 1977. In 1979 and during the first half of 1980, some recovery was noticed. But the overall trend covers up three major aspects: government gross fixed capital investment decelerated from 1976 until the first half of 1980; business investment in residential construction declined between 1977 and mid-1980 so that housing starts have fallen from an annual rate of about 275,000 to less than 160,000; and business investment has run countercyclically and has increasingly been dominated by large-scale and long-term projects.

Business investment in non-residential construction grew very strongly from 1973 through 1975, but this was followed by poor investment expansion until 1979 when recovery was pronounced; the trend in 1980 appears even stronger than that in 1979. Growth in business investment in machinery and equipment was slow from 1975 through 1978, but was strong in 1979. For the first half of 1980, however, investment in machinery and equipment increased at only one-half the 1979 rate. In the past, high labour productivity gains have been associated most directly with growth in investment in machinery and equipment. Thus the currently increasing proportion of investment directed towards construction

by business has given rise to some concern. This phenomenon is associated with an increasing dominance of large project developments in the investment scene over the past decade — a trend we expect will continue through the 1980s.

The seeds of the private business investment recovery in 1979 can be found in the gradual depreciation of the Canadian dollar to approximately 85 cents in terms of U.S. dollars since 1978. As the dollar depreciated merchandise exports began a strong climb, capacity utilization in the export sector recovered to long-term averages by early 1978, and profits rose. These factors, along with the recovery in world prices for many basic commodities, were all critical incentives to investment, explaining the 1979 upswing that has acted to soften recessionary pressures.

Throughout the 1970s investments in electrical utilities have been large and widespread. Billions of dollars of construction activity are presently underway and will extend into the mid-1980s. Additional electrical output capacity is now coming on stream and is planned to increase rapidly in the early 1980s. In addition, other energy projects are under construction, while even larger and more numerous projects are awaiting approval and resolution of energy pricing policy. These energy production and transportation projects are sufficiently large that they will cause the investment component to rise significantly as a share of gross national expenditure.

In sectors where prices are controlled by government, the uncertainty surrounding present policy appears to be constraining private investment more than the uncertainties associated with normal market conditions. Businessmen are apparently better equipped to assess market uncertainties — or believe that they are. But in the sectors in which output prices are not “administered” — pulp and paper, mining, chemicals, and manufacturing — the investment strength developed in 1979 and early 1980 appears likely to continue in the short term.

In 1973 the Canadian economy was very near producing at its potential. Since that time, weak demand in the rest of the world and poor investment and consumption demand internally have led to an increasing gap between actual and potential output. To make matters worse, the rate of growth of potential output itself has slowed over the latter part of the 1970s.

AGGREGATE PRODUCTIVITY

In the last half of the 1970s the rate of output growth in Canada slowed without a corresponding reduction in the growth rate of labour or capital inputs to the production process (Chart 1-3). As a result, the rate of growth in labour, capital, and total factor productivity all declined

during the past five years. Even after adjusting for cyclical variations, the record is one of increasingly dismal productivity growth performance. The reasons for this phenomenon are not immediately obvious.

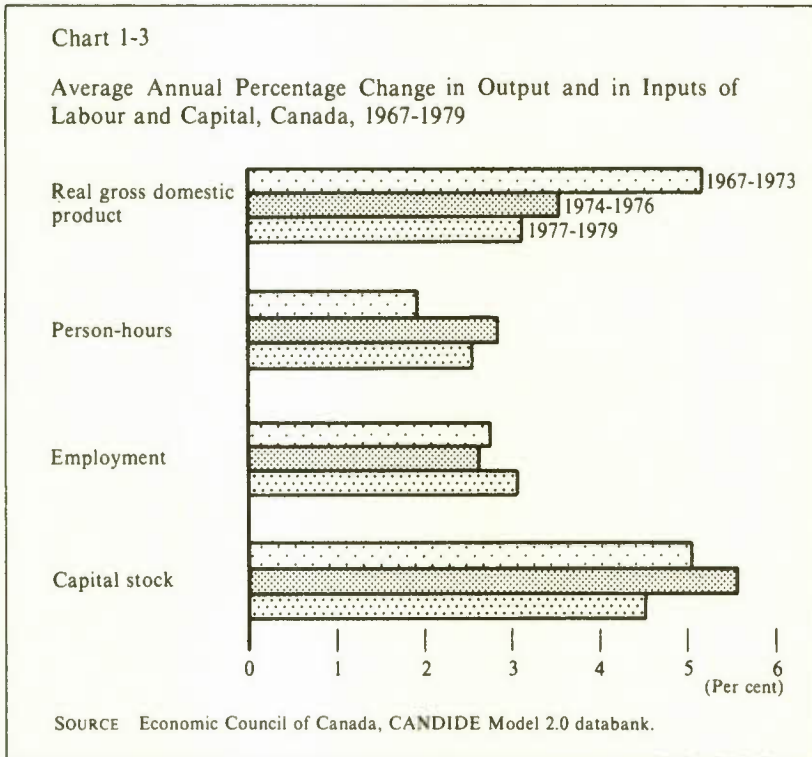


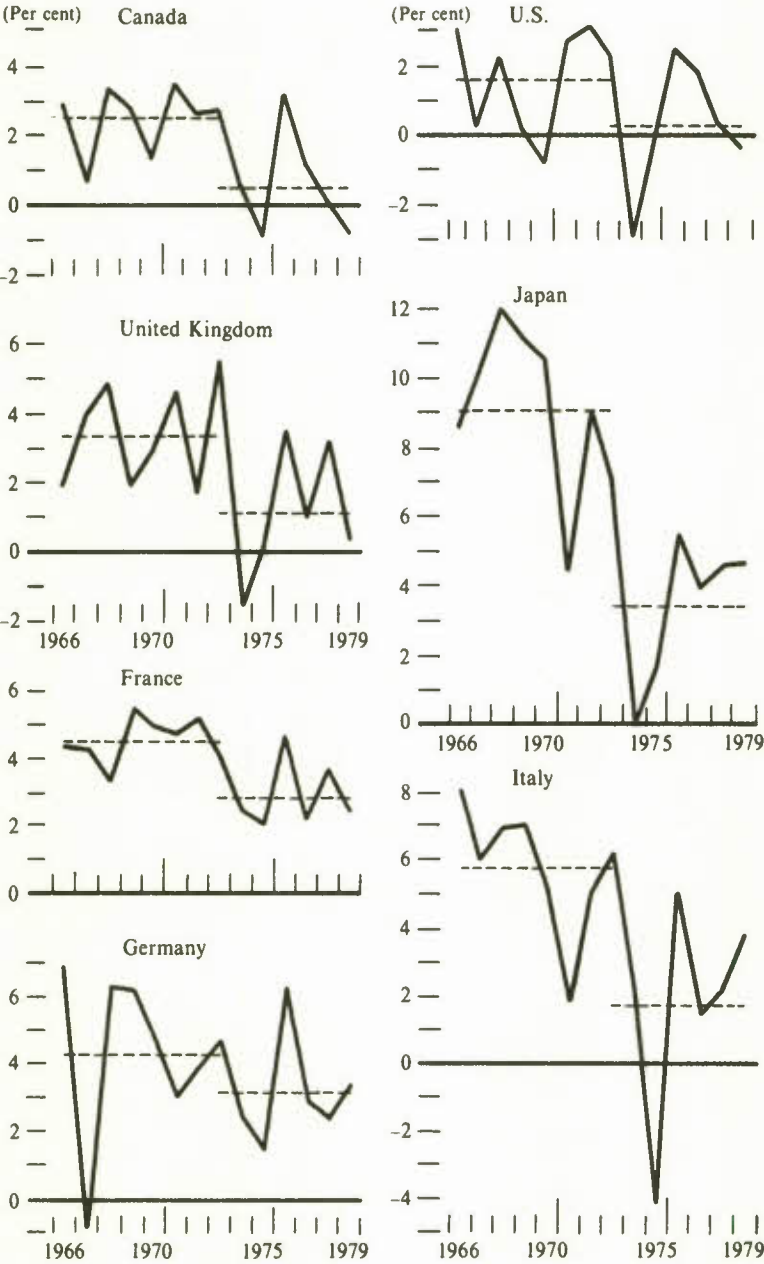
Chart 1-4 illustrates that a slowdown in rate of growth in labour productivity, measured in terms of output per person-hour, has occurred in all the major industrialized countries with which Canada trades and competes. The slowdown is less pronounced in Germany and France, but no major industrialized country has escaped unaffected. This leads to a suspicion that some common element underlies this international phenomenon.

The energy crisis and parallel commodity price explosion triggered by the acute hike in international petroleum prices have been accused of playing a major direct role in the international productivity slowdown. But the case is not completely convincing. Similar industries in different countries have not registered like reductions in productivity performance. Moreover, with a falling Canadian exchange rate from 1976 until 1979, Canadian export industries expanded their capacity utilization and output without a marked improvement in labour productivity in the economy as a whole. No doubt slow demand and output growth are a major explanation of the low rate of productivity gains. Because of the

Chart 1-4

Annual Percentage Change in Output per Employed Person,
Canada and Major OECD Countries, 1966-1979

----- Average for time period indicated

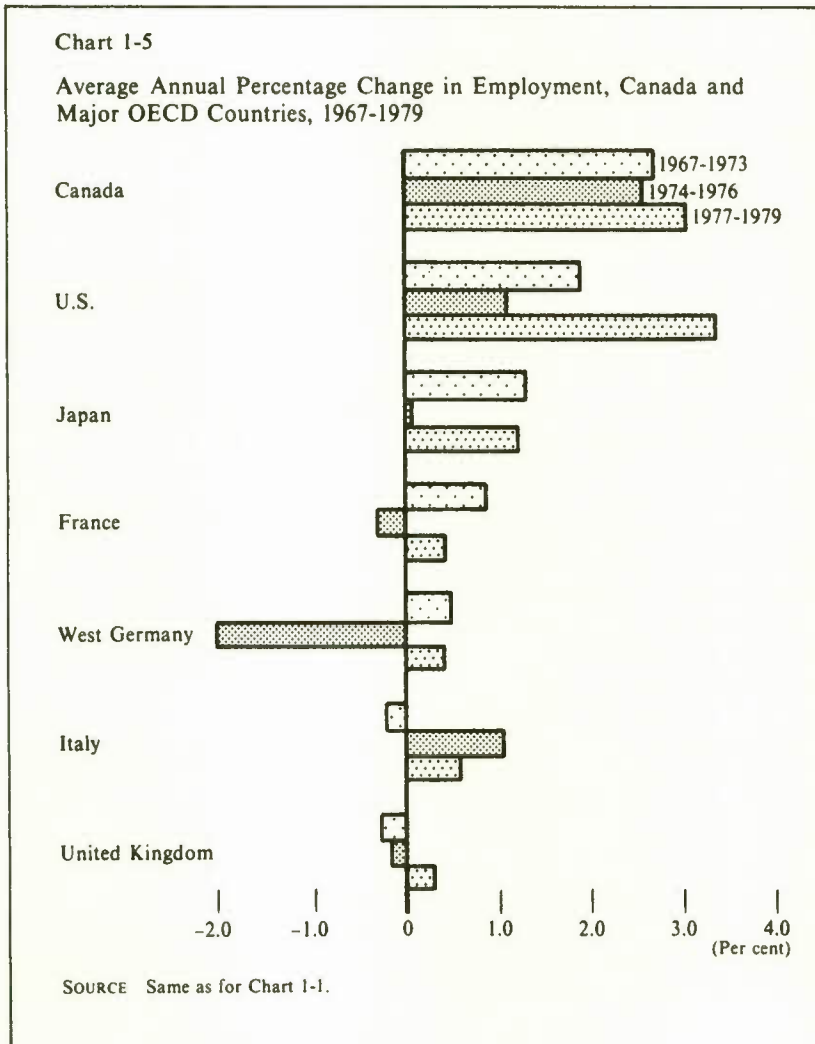


SOURCE Same as for Chart 1-1.

implications for the standard of living in Canada, this persistent problem demands much more detailed examination, and we turn to this task in Chapters 4, 5, and 6.

EMPLOYMENT

Employment growth in a number of industrialized countries, and most notably in the United States and Canada, was quite strong in the late 1970s (Chart 1-5) in spite of the slow growth in output. At the same time, in both Canada and the United States, participation rates for women and young people grew significantly. This, along with the increasing numbers of young people coming of working age, more than offset the increase in employment.



In Canada, the seasonally adjusted unemployment rate was up from 6.9 per cent in the first quarter of 1976 to 7.4 per cent in the first quarter of 1980. By that time as well, slowdowns in some OECD countries and recessions in others had led to rising unemployment rates once again.

Labour market problems are not only associated with lack of aggregate demand. There are shortages of certain occupational skills in Canada. Data collected by the Human Resources Survey conducted by the Economic Council indicate that personnel shortages constitute a significant problem in Canadian industry. About one-half of the establishments surveyed reported some hiring difficulties in the recent past, and most anticipate similar shortages in the near future. The difficulty of finding people with the required skills is greatest in the west, and particularly in Alberta. As the economy moves towards its potential, these problems will become more intense.

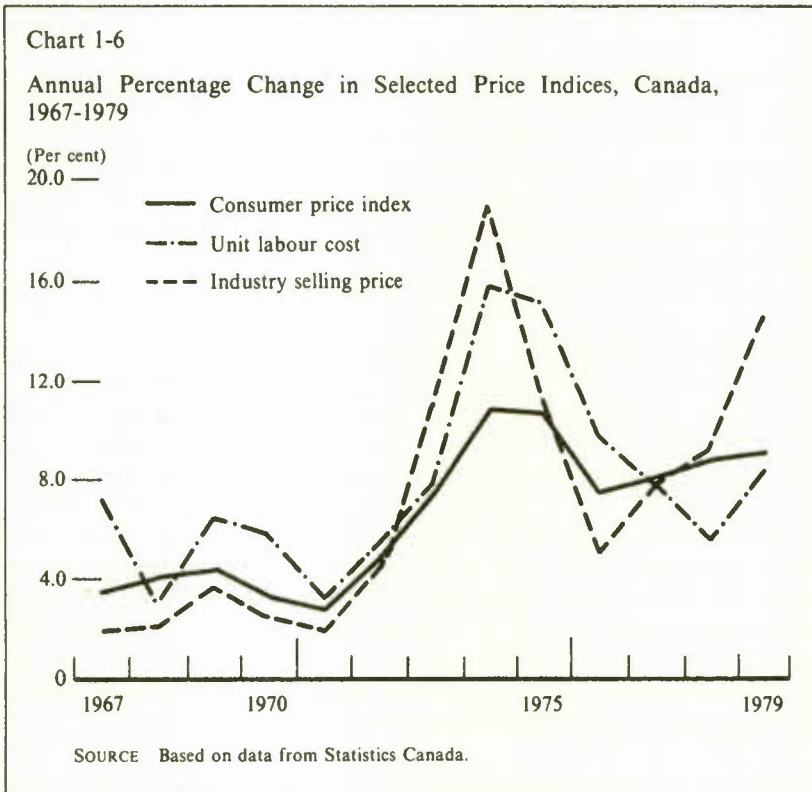
PRICES AND INFLATION

Without doubt, the most important international price change in the past year and a half was the more than doubling in the base price of crude petroleum, even from the lower price OPEC suppliers such as Saudi Arabia. Whereas in mid-1978 the average price of Canadian crude imports was less than \$14.50 Canadian dollars per barrel, by late 1979 the average was close to \$30. After several years of comparatively low prices for food and industrial materials following the break in the upward trend in 1975, prices moved up by about 20 per cent in 1979, falling back a bit in 1980. These increases in energy, food, and industrial prices have created problems of real income and structural adjustment in various countries and added to their inflationary difficulties.

The rate of inflation varies greatly from country to country but in most of the OECD countries inflation was higher as the 1980s began than in the early 1970s. But the way in which price indicators are developed varies from country to country, and thus caution must be used in making comparisons of inflation rates. Still, by most indicators, over the last four years the rate of inflation has accelerated at least marginally from its previous trend.

One indicator of the trend is the underlying rate of inflation. This indicator is widely measured by the rate of increase in labour costs per unit of output, which combines the effect of changes in labour income per person employed and in productivity per worker. The underlying rate of inflation says nothing about causes of inflation; it just provides a reference point for measurement. In early 1980, the rate was hovering around 10 per cent, comparable with a similar range in 1976. In the interval, this measure had fallen down to the 5 per cent range and then risen quickly in 1979. While unit labour costs were increasing, the rate of increase in

nominal labour income was well below 10 per cent in 1979 and the first half of 1980, whereas it averaged around 16 per cent in 1976. A major factor in the increase in labour costs per unit of output since 1978 has been the deterioration in average productivity in the Canadian economy as a whole (Chart 1-6).



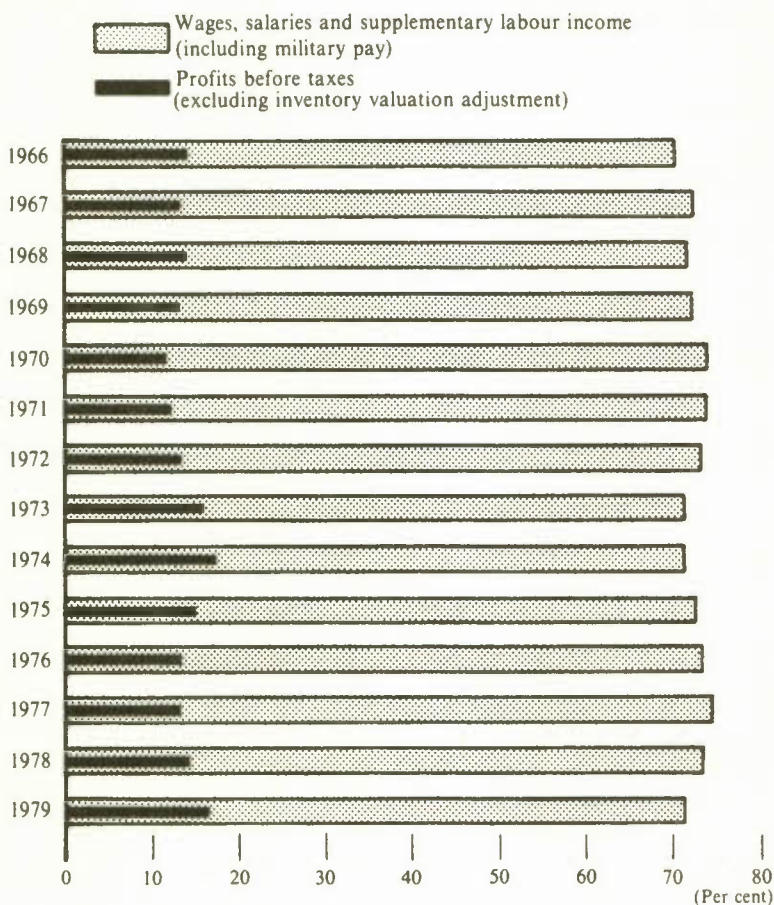
INCOME SHARES, REAL INCOME, AND PERSONAL SAVINGS

The July 1980 OECD *Outlook* reported that, while wages had increased only modestly in 1979 and the first part of 1980, profits and profit margins had remained substantial, despite higher prices for oil and industrial materials. Similarly, the flow of income and its disposition in Canada in recent years show the unusually large increase in the share of profits and the smaller share of wages; the important role of income support programs and the tax structure in maintaining nominal disposable incomes; the squeeze on real wages; and the continued high personal savings rates in Canada (Chart 1-7).

In 1979 and the first half of 1980 wages and salaries dropped further below their trend share than at any time in the last fifteen years. In this respect, the situation is much like that in 1973 and 1974, just before the

Chart 1-7

Earnings and Profits as Shares of Net National Income, Canada, 1966-1979



SOURCE Based on data from Statistics Canada.

rapid acceleration in wage and salary rates in the mid-1970s. By contrast, corporate profits, even excluding inventory profits, stayed well above their trend share of national income in 1979 and 1980, much as they were in 1973 and 1974.

The share of individual investment income, in net national income, also became much larger in the late 1970s. The latter trend reflected both the recovery of the real rate of interest and the accumulation of personal wealth, reflecting the high rates of personal savings. Personal savings rates held at record levels for the postwar period, averaging in the range of 10 per cent of personal disposable income.

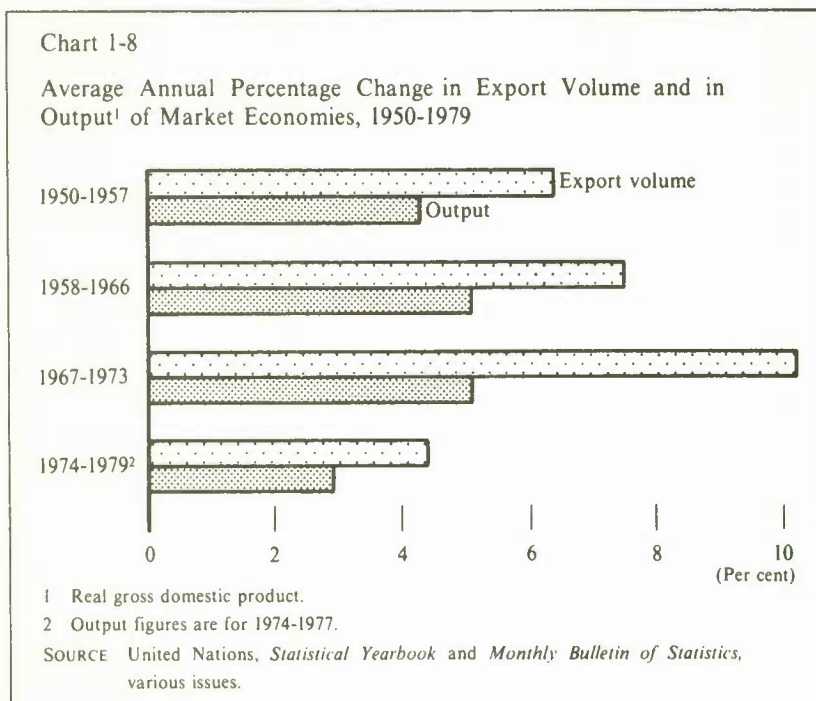
Tax changes, the tax system, indexing, and transfers have helped to sustain the real income of Canadian household even while wage increase rates have been falling. Between the first quarter of 1976 and the second quarter of 1980, earned income increased 55.3 per cent, and personal disposable income – after taxes and government transfers – increased by 55.4 per cent. But when allowances are made for inflation, real personal disposable income per employee in Canada fell almost 4 per cent between the first quarter of 1978 and the first quarter of 1980. Since the number of employees per family has continued to drift up a bit, the decrease in average real family income has been somewhat lower than that in real wages per employee. Nonetheless, the decline in real income is exceptional in Canada's postwar experience, particularly in a period of positive, if somewhat slower than usual, overall economic growth. One serious implication in a period of slow growth is that income expectations do not fall simultaneously and wage negotiations may become particularly difficult.

INTERNATIONAL TRADE AND PAYMENTS

Increasing growth in world trade in the 1960s was associated with rising growth and productivity. Paralleling the slower growth in output in the industrialized countries, the growth in the volume of world trade slowed in the late 1970s (Chart 1-8). While overall world trade did grow slightly faster than world output recently, the rate of growth was well below the trend during the 1950s and 1960s. From 1975 until the 1979-80 energy price increase, it was generally thought that corrections had been made for the imbalances created by the acute oil price hike in 1973 and subsequent smaller increases. Because of exchange rate and balance-of-payments adjustments, the view was that the chances of big, intractable international imbalances in the future had been reduced. Now observers are not so sure, and the imbalances arising from the oil price changes are dominating medium-term concerns.

The most recent round of increases in international oil prices has led to massive increases in the current account surpluses of oil exporters and in the deficits for oil importing industrial countries and for non-oil exporting developing countries, as large payments have been made from the rest of the world to the oil exporters. Because of a slowdown in growth rates, to which higher energy prices may have contributed, the burden of the oil payments are having to be met from stagnating or shrinking output. Many oil-importing countries are adversely affected in two ways.

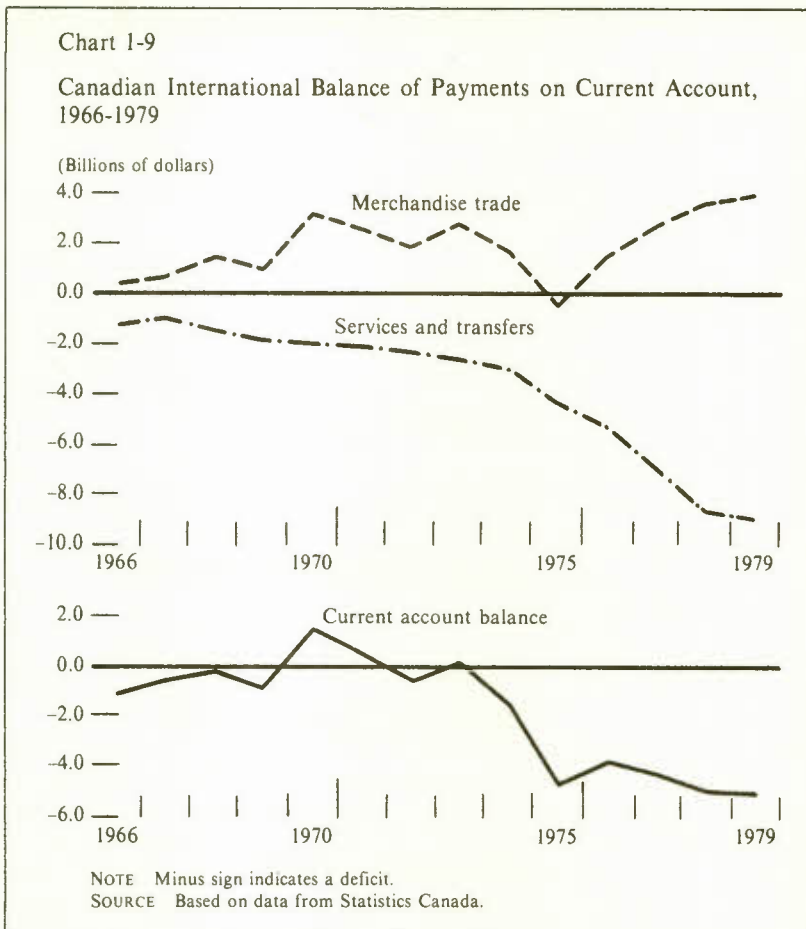
Canada's external trade and payments in the most recent years were, in fact, reasonably stable (Chart 1-9). As a percentage of GNP, net long-term capital inflows into Canada fell somewhat from the admittedly unusually high rates during the 1975-77 period. Some increases in net inflows of short-term capital and some decreases in official reserves have



taken place. But a substantial part of the net inflow of debt capital into Canada in recent years appears to have been used to finance both private and government consumption. Earnings assets have not been created, and thus the debt service burden is to a degree an increasing external burden. While net inflows of direct investment capital have continued, the most important characteristic in the last several years has been the sharp rise in the level of direct capital outflows from Canada to foreign countries.

No sustained movement in the Canada-U.S. dollar exchange rate has occurred in the last year and a half. Some analysts claim that the attempt to maintain the exchange rate in the range of 83 to 87 cents in terms of the U.S. dollar, without massive use of exchange reserves and national external lines of credit, has put pressure on Canadian monetary authorities to keep Canadian interest rates close to the high U.S. rate. They argue that this approach has been detrimental to the domestic economy.

In external merchandise trade Canada continues to be a net importer of highly processed goods and exporter of raw partially processed goods. Though less so than a few years ago, Canada's net export balance on merchandise trade is based in part on Canada being a net energy exporter. This is in contrast to our industrialized trading partners who import large amounts of energy (Chart 1-10). The combined value of exports of natural gas, uranium, coal, and electricity continues to exceed the imports of crude petroleum. But if Canadian energy performance,

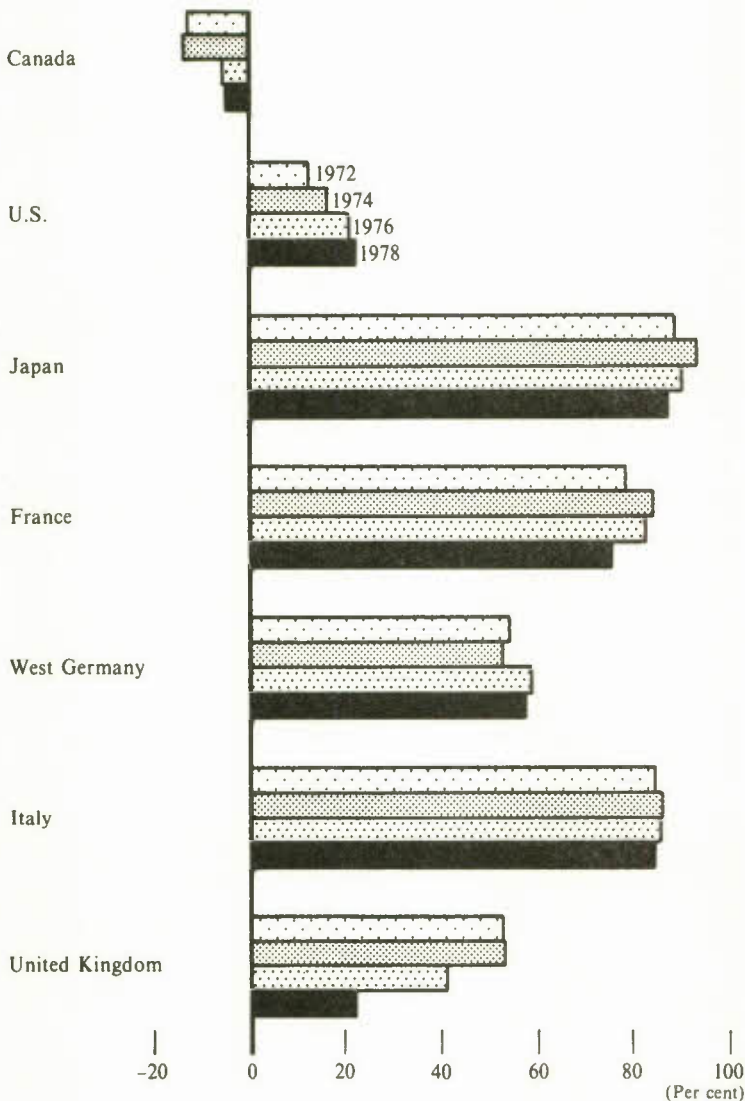


policy, and the trade developments implied at the beginning of 1980 remained unchanged for much of the 1980s, Canada would become a substantial net energy importer. Imports of textiles, clothing, and footwear in recent years have been restricted by special Canadian trade policy measures, partly as a reaction to the fact that such imports had achieved much greater penetration of Canada's markets than those of other industrial countries.

The newly industrializing countries (NICs) present a challenge to Canada's merchandise trade. While our imports from the NICs, such as Korea, Taiwan, Singapore, Hong Kong, Brazil, and Mexico, are still small, they are increasing. In addition, some of these countries are extending their production from traditional soft goods to iron, steel, machinery, and electronic equipment. Thus far the import competition from offshore hard goods producers has been minimal, but the potential is clearly emerging.

Chart 1-10

Dependency¹ on Energy Imports, Canada and Major OECD Countries, Selected Years, 1972-1978



¹ Imports as a percentage of total energy requirements. A minus sign indicates a net exporter.

SOURCE Organisation for Economic Co-operation and Development, *Energy Balances of OECD Countries*, (Paris: OECD), various issues.

Equally important is the fact that the industrial growth of many developing countries creates opportunities for Canadian producers, provided they are competitive suppliers. In the period from 1970 to 1975 the share of Canadian exports going to developing countries rose by around 5 per cent. Export growth was most dramatic in trade with the Middle East, where there has been a marked increase in sales of machinery and transportation equipment. The oil-producing countries, Commonwealth Africa, and some Latin American countries are also important potential markets not only for Canadian food but also for a wide range of manufactures. Demand for services from Canada may increase as well as these countries industrialize and urbanize.

Both the actual success and the prospects for Canadian manufactured exports have improved enormously in recent years. This record suggests that the payoff from Canadian export development is likely to be large. But a nagging doubt persists about whether Canada will be able to enlarge its trade surplus aside from that derived from greater energy and resource product exports. Especially worrisome are the prospects that wage rates may increase while productivity improvement lags, that large inflows of capital for energy developments may lead to exchange rate appreciation, and that new waves of protectionism might limit Canadian entry to new markets. All of these factors could slow export growth.

Conclusions

Our review of the performance of the Canadian economy in recent years leads us to some important conclusions. First, Canada has put off or slowed down its adjustment to major changes now occurring in the international economy. Like it or not, substantial changes in the Canadian economy are going to have to be made in response to the increased price and reduced availability of energy and the altered strategic considerations in energy supply; the challenge of the newly industrializing countries; the new institutions and environment for international trade; the technological advances; and the restructuring of the automobile industry throughout the world. Second, with some notable exceptions, something – perhaps reluctance or difficulty in the face of uncertainty – is holding back clearly desirable long-term investment developments, both in large and small ventures. Third, the country's fiscal system and some features of its international position appear, with every passing year, to be more in need of major change. Tinkering with a few taxes or a few trade and debt management arrangements will not be adequate for the necessary adaptation of those structures. Fourth, the short-term international economic outlook has become adverse for Canada, creating inherent problems as well as an environment in which medium-term structural adjustments will be difficult. Fifth, the slowdown in the growth of real income means greater difficulty in financing the rising burden of transfers to persons.

Still, as we emphasize later in this Review, Canadians have many favourable opportunities. But in a large number of important areas of economic and social policy, Canadians must make hard choices in the next few years that will profoundly affect our economic performance. Chapter 2 outlines the effects of some possible choices for the 1980s.

2 Facing the Eighties

Chapter 1 showed that the economic problems Canada and indeed most industrialized nations faced last year have persisted. Deterioration in the performance of our major trading partners, especially the United States, and acute increases in the international price of basic commodities, particularly petroleum, have contributed, directly and indirectly, to reduced productivity and output in Canada. These factors have magnified domestic problems in virtually every area. Foreign economic recovery is not expected to be pronounced or rapid, and there are no guarantees that international oil prices will not once again double or triple in the 1980s. Thus the present external environment does not offer a much improved outlook for Canadian performance.

In our Sixteenth Annual Review we pointed out that many possible policy changes would bear unfavourable side-effects. Now, domestic economic problems seem even less amenable to an "easy policy fix." Indeed, there may be risks associated with the alterations in domestic oil pricing policy, the delays in proceeding with energy investment and conservation programs, and the acceleration of wages. And policy actions themselves are constrained because of the concentration of the overall government deficit in the federal sector.

The Reference Cases

The impact of policy or other changes on the economy cannot be examined in a vacuum. What we need are some reference positions with which to compare the changed situation. Much of our work in this chapter focuses on the CANDIDE Model 2.0 "base case projection" of the economy. This projection is predicated essentially on a continuation of existing policies, allowing only for changes that had been announced by the beginning of October 1980, or which, as in energy-investment developments, are already scheduled. It assumes an increase in the wellhead price of oil that is in keeping with recent actions taken by the governments of Alberta and Canada. It also includes the effects of our most recent assessment of the economic prospects of our major trading partners; if that assessment should change, the base case projection would

have to be changed accordingly. This exercise allows us to remark on the deterioration in the economic situation since last year and to evaluate various possibilities for improved economic performance in Canada. Later in the chapter we discuss the use of the concept of potential output as a measure of how the economy is performing and as an achievement target.

THE BASE CASE PROJECTION

Our base case projection at this time is not optimistic (Table 2-1):

- Real growth in 1980 is expected to be extremely weak, with unspectacular recovery projected during the 1981-83 period. Only in the closing years of the decade is actual performance projected to be near its potential level.
- Inflation is anticipated to approach the double-digit range in 1980, with the rate continuing to be high through 1982. In the longer term, the projected annual inflation rate is in the range of 8 to 9 per cent.
- The unemployment rate is expected to hover around 8 per cent through 1981 and to drift downward slowly to under 6 per cent only by the close of the decade.
- Labour productivity – defined as output per person-hour – falls sharply in our projections and, although the rate of growth is projected to become positive again in 1982, only in 1986 and 1987 does this measure reach the growth rate experienced in 1977. Indeed, no recovery to the rate achieved prior to 1974 is foreseen during this decade. This projection implies that the decline in productivity in recent years was not due entirely to temporary factors.
- Although the rate of growth in nominal wages is projected to recover from below 8 per cent in 1980 to near 10 per cent in 1982 and thereafter, the rate of growth of real wages will remain negative until 1983, with only a modest recovery thereafter.
- A decline in the personal savings rate from the current high level of above 10 per cent of disposable income is projected, in part because the existing tax incentives to save are reduced by inflation.
- An increase in the percentage of output devoted to investment is expected, but the investment boom will be dominated by the large energy projects that are assumed to be initiated in the early part of the decade. In the medium term, these projects may have a favourable effect on the current account balance of international payments and energy self-sufficiency among other things.
- The trend towards federal deficits and provincial surpluses is projected to continue, with the federal deficit easing somewhat in the late

1980s. Provincial surpluses are expected to increase to 1985 and then decline to about the same percentage of gross national expenditure in 1990 as in 1980. These results are conditional upon continued restraint in government expenditure throughout the decade.

- The current account balance of payments is expected to remain in deficit over the period, with its share of gross national expenditure moving from slightly below to marginally above 2 per cent.

Three broad sets of assumptions underly these projections. First, we anticipate very poor performance abroad in 1980 in the OECD countries and especially in the United States, with only weak recovery in 1981. In 1982, growth in gross national expenditure in the United States is projected to be above 3.5 per cent, but thereafter the base case solution incorporates an average growth rate of under 3 per cent per year. For the United States, the unemployment rate is assumed to climb to over 8 per cent in 1981 and to fall towards a path close to 7 per cent as the mid-point of the decade approaches. The inflation rate in the United States is expected to be close to 14 per cent in 1980 and to average just over 9 per cent for the remainder of the decade. U.S. short-term interest rates are anticipated to follow a downward path to 9 per cent by mid-decade.

The performance anticipated for the United States and some other OECD countries implies that the 1981-82 recovery period will be weak and prolonged rather than strong and quick like the upturn experienced after the 1974-75 downturn; for example, U.S. real growth approached 6 per cent in 1976, much higher than anyone anticipates for the upcoming recovery. Obviously, Canada cannot expect to recover rapidly. Worse still, the particularly weak sectors in the United States – the automobile, farm machinery, steel, and lumber industries – are very important for Canadian exports.

The second set of assumptions is based on the major energy investment projects now underway or anticipated during the 1980-90 period (Chart 2-1). These projects are expected to be phased in during the decade, adding approximately \$13 billion (\$1971) in investment. Cancellation or postponement of, or delays in undertaking, any of these projects will have depressing effects on the Canadian economy, as we note later in the chapter.

The third set of assumptions relates to energy pricing (Table 2-2) and fiscal and monetary policy. The international price of petroleum is assumed to increase at 10 per cent a year on average during 1981-85 and then at just under 9 per cent annually for the remainder of the decade. These changes follow on top of the rather sharp adjustment in 1980. They imply that domestic prices will increase more rapidly than international prices, in nominal terms, from 1981 through 1985. After 1985, however,

Table 2-1
Selected Indicators from the Base Case Projection, 1980-1990

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
						(Percentage change)					
Gross national expenditure (1971\$)	-0.4	1.4	3.1	3.5	3.3	2.4	2.7	3.1	2.6	2.2	2.6
Consumer price index	9.8	10.6	9.9	9.0	9.0	8.7	8.1	8.4	7.9	8.1	8.2
Labour force	2.4	2.1	1.9	1.9	1.9	1.5	1.7	1.5	1.6	1.5	1.4
Employment	2.0	2.0	2.4	2.4	2.4	1.7	1.7	2.0	1.9	1.5	1.7
Productivity (output per person-hour)	-2.3	-0.7	0.9	1.3	1.1	1.0	1.4	1.4	1.2	1.0	1.3
Real wage rate	-2.2	-2.4	-0.1	0.7	0.5	1.2	1.7	1.3	2.2	1.9	2.0
Nominal wage rate	7.4	8.0	9.8	9.8	9.6	9.9	10.0	9.8	10.2	10.1	10.4
						(Per cent)					
Unemployment rate	7.9	8.0	7.5	7.0	6.7	6.5	6.5	6.1	5.9	5.9	5.6
Saving rate ¹	10.1	9.5	9.2	9.1	8.8	8.6	8.5	8.3	8.1	7.9	7.6
Participation rate ²	62.4	62.7	63.1	63.5	64.0	64.3	64.7	65.1	65.5	65.9	66.3
						(Percentage of GNE)					
Real investment	22.6	23.0	23.2	23.8	24.6	24.8	24.9	25.1	25.2	25.3	25.4
Government surplus or deficit (-):											
Federal	-3.8	-4.0	-3.6	-3.3	-2.5	-2.5	-2.4	-2.3	-1.9	-1.7	-1.3
Provincial	1.0	1.4	1.7	1.8	1.9	2.0	1.9	1.8	1.5	1.3	1.1
Balance of international payments											
Current account	-1.8	-1.8	-1.6	-2.0	-2.1	-2.2	-2.2	-2.4	-2.3	-2.4	-2.3
Energy	1.2	1.5	1.5	0.9	0.8	0.4	--	-0.4	-0.7	-1.0	-1.1
Non-energy	-3.1	-3.3	-3.1	-3.0	-2.9	-2.6	-2.2	-2.0	-1.6	-1.4	-1.3

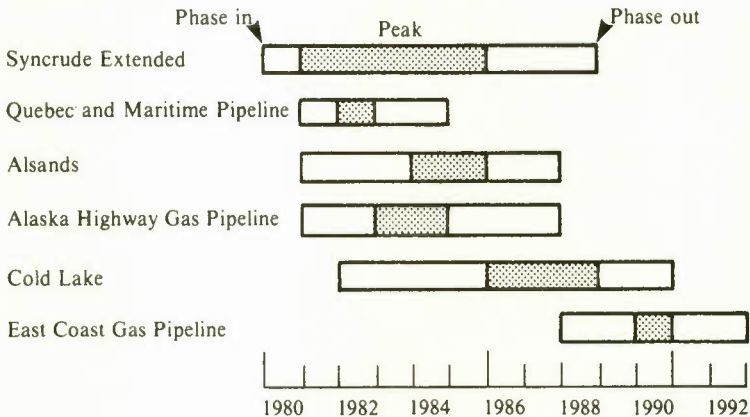
1 Personal saving as percentage of personal disposable income.

2 Labour force as percentage of population age 15 and over (1971 Revision).

SOURCE Economic Council of Canada, CANDIDE Model 2.0, August 1980.

Chart 2-1

Time Phasing of Large-Scale Energy Investment Projects, Base Case Projection, 1980-1992



NOTE Individual electricity projects were not identified.
 SOURCE Estimates by the Economic Council of Canada.

international prices are assumed to increase at more than \$4 per barrel yearly. Under the policy in place at the beginning of October 1980, the gap between domestic and international prices would open, from approximately \$20 per barrel in 1985 to \$30 in 1990.

In our base case projection we assumed that the wellhead price of crude oil will advance at the rate of \$4 per barrel per year from 1981 onward. However, as an initial working assumption the revenue splits between the federal and provincial governments and producers, and the federal oil import subsidy program, are assumed to continue as they were at the beginning of October 1980.

No new domestic fiscal or monetary initiatives are introduced into our base case. Personal and corporate tax rates, contribution rates associated with pensions and unemployment insurance, and benefit rates associated with the latter are all assumed to remain as is. Real government expenditures on goods and services are held to a 1.5 per cent annual growth rate. We have assumed that established program financing agreements covering education, medical care, hospital care, equalization payments, and tax points will be renegotiated in 1981-82, but that they will continue along their current lines. The growth of the money supply is assumed to be 8 per cent, which lies at the high end of 5 to 9 per cent range in the Bank of Canada's expressed policy. As well, interest rates are expected to be sensitive to the path of U.S. rates.

Table 2-2

Canadian, United States and World Crude Oil Prices, Selected Years, 1980-1990

	1980	1982	1985	1990
	(Canadian dollars)			
Canadian (wellhead) price per barrel ¹	15.58	23.49	35.33	55.01
U.S. price per barrel ²	25.71	44.10	58.28	88.95
World price per barrel ³	34.42	41.95	55.43	84.59
	(Per cent)			
Canadian as percentage of U.S. price	60.6	53.3	60.6	61.8
Canadian as percentage of world price	45.3	56.0	63.7	65.0

1 From the base case projection. Assumes a domestic annual price increase of \$4 per barrel from 1981 to 1990.

2 Anticipates that the U.S. price will be decontrolled by 1982.

3 From the base case oil pricing assumptions. Provides for a 1.0 to 1.5 per cent increase in the real price of crude after substantial adjustment in 1980. Differences between the world price and the U.S. price reflect transportation costs.

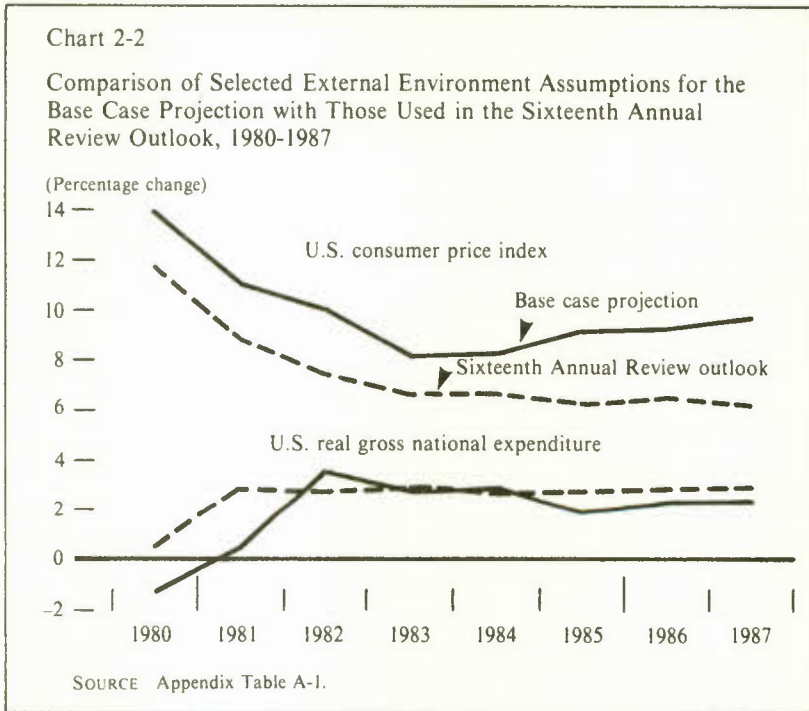
SOURCE Same as for Table 2-1.

The Effect of the Worsened External Environment

The external environment assumptions that lay behind the reference base projection that we used a year ago for the Sixteenth Annual Review were unfavourable enough. But the situation has deteriorated since then, and this is reflected in our current base case scenario. The present outlook for foreign economies is illustrated in Chart 2-2 (see also Appendix Table A-1). The base case, which incorporates a "low" growth assumption for the U.S. and overseas economies, is compared with the outlook in last year's Review, to show how much the perspective on the future can change in just one year. Projections for a "medium" and a "high" growth outlook are also included.

It was assumed in the reference projection of the Sixteenth Annual Review that real growth in the U.S. economy would rise to 2.9 per cent in 1981. Now, however, our base case assumes 0.5 per cent real growth, while the "medium" projection is 0.8 and the "high" estimate is 2.4 per cent. At the same time last year the real rate of growth in the United States was anticipated to be one-half of one per cent in 1980. Our base case now estimates a 1.3 per cent decline, while the "medium" and "high" outlooks are for positive rates of only 0.1 and 0.2 per cent, respectively.

The U.S. inflation rate incorporated into last year's base case hovered near 12 per cent in 1980 and 9 per cent in 1981, with a gradual decline to just above 6 per cent per year in 1987. Our base case now assumes 14 per cent for 1980 and just over 11 per cent in 1981, with the remaining years fully 1.6 to 3.2 points higher than the earlier estimates. The medium and high projections imply better price performance, compared with our

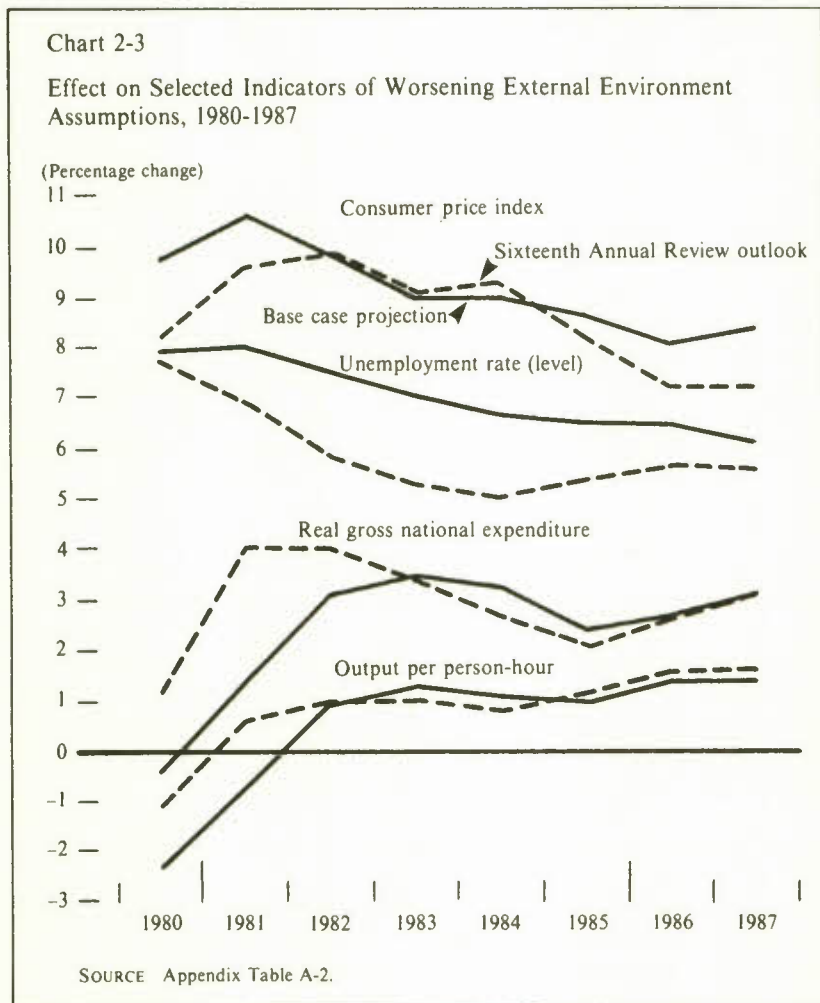


current base case, except in 1980. Last year, U.S. interest rates were expected to be in the 8 per cent range to the mid-1980s. Now, however, we anticipate they will be over 10 per cent for 1981 with only a slow rate of decline to the 8 to 9 per cent range over the remaining years of the decade. The medium and high outlooks are for rates over 13 per cent in 1980, over 10 in 1981, and over 9 in 1982, with the rate falling to about 8 per cent in the latter years of the decade (see Appendix Table A-1).

The substantial adjustment in the price of oil in early 1980 was clearly not anticipated in last year's Review. In the international arena, the oil price was anticipated a year ago to increase by 7 per cent annually. Today our forecasts expect the price to increase approximately 10 per cent each year during the 1981-84 period and just under 9 per cent thereafter.

Chart 2-3 summarizes the effects on the Canadian economy of changing the assumptions about the external economic conditions. Compared with projections derived from last year's external assumptions, our current base case estimates of the domestic rate of growth in gross national expenditure are 1.6 percentage points lower in 1980, 2.6 lower in 1981, and 0.9 points lower in 1982; thereafter, our current base case projects higher growth rates. Similarly, in our base case, output growth tracks below the performance calculated from the medium and high U.S.

outlooks for the whole decade (see Appendix Table A-2). As a consequence, for the coming years our base case projection of unemployment, while drifting down, is distinctly higher than that in last year's Review.



At the same time, deterioration in output performance would be accompanied by a higher inflation rate in 1981 and 1982. After that, however, prices would rise less rapidly in the 1982-84 period than projected on the basis of last year's external assumptions, but more rapidly thereafter. The inflation rates projected under the medium and high U.S. outlooks are consistently lower than those under the base case.

The deterioration of the economic outlook for our major trading partners is also evident in a comparison of labour productivity performance projections for 1980 and 1981. The shock, as approximated by the

difference in outlook between now and this time last year, changes the Sixteenth Annual Review estimate of a 0.6 per cent increase in output per person hour in 1981 to a decline of about the same amount. From 1982 onward, the productivity gains and losses even out. As expected, the medium and high outlooks for foreign economies generally lead to better domestic labour productivity performance from 1982 on than does our current base case projection.

The figures for the federal deficit as a percentage of gross national expenditure indicate the extent to which the federal government will suffer as a result of low growth in the world economy. On the basis of the August 1979 assumptions, the federal deficit was projected to decline steadily from approximately 3.1 per cent to just over 1.0 per cent of GNE as the decade unfolded. With the deterioration in the U.S. situation, the deficit is estimated to be very much higher. The calculations indicate the degree of sensitivity of the federal deficit to events over which the government has no control. For example, a recession in the U.S. will clearly raise Canada's federal deficit. Moreover, provincial surpluses would also be reduced should the projections of our base case prevail rather than either the higher or medium growth perspective on external economic conditions.

Comparison of our projections of last year and this year indicate that the additional inflation, the higher federal deficit, and the reduction of output and productivity growth in Canada in the 1980-82 period are related in part to the deterioration in the world economic environment and particularly to the abrupt cyclical adjustment in the United States. The results suggest that a more favourable external environment, particularly in the United States, would tend to make many of these problems recede in intensity, though they would not disappear completely.

But in assessing the long-run rate of growth of output, productivity, and inflation we must be very careful to separate long-term trends from cyclical aberrations. Poor performance now and in the near-term future is not necessarily a permanent feature of the economic system; for example, the shock of a worsening external environment is essentially cyclical in nature. Output growth is anticipated to be better after 1982 under all of our current external outlooks than it was in last year's projections. Unfortunately, the prospect for strong and sustained recovery of labour productivity is not as optimistic in our current perspective of the future. This gives us all the more reason to emphasize the productivity issue at this time.

In last year's Review two driving forces in the Canadian economy could be identified: the world, and particularly the U.S., outlook even though it appeared modest at the time; and high domestic energy investment. Now only the latter remains to move the Canadian economy forward in the 1981-83 period. This change accounts for our expected

Table 2-3
Effect on Selected Indicators of Alternative Wage and Price Assumptions, 1980-1990

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
	(Percentage change)										
Consumer price index											
Base case projection	9.8	10.6	9.9	9.0	9.0	8.7	8.1	8.4	7.9	8.1	8.2
Real wage maintenance	10.1	11.4	11.0	10.0	10.0	9.6	9.0	9.1	8.4	8.3	8.1
OPEC and commodity price explosion	9.8	10.6	9.9	9.0	9.9	11.4	11.0	10.4	8.8	8.2	8.6
Low monetary growth	9.8	10.2	9.3	9.2	9.0	8.5	8.0	8.3	7.9	8.2	8.3
Nominal wage rate											
Base case projection	7.4	8.0	9.8	9.8	9.6	9.9	10.0	9.8	10.2	10.1	10.4
Real wage maintenance	8.4	10.3	11.9	11.9	11.5	11.7	11.6	11.2	11.5	11.0	11.1
OPEC and commodity price explosion	7.4	8.0	9.8	9.8	9.6	10.4	11.7	11.4	11.2	10.3	10.1
Low monetary growth	7.4	8.0	9.4	8.6	8.9	9.0	9.0	8.8	9.4	9.4	9.8
Import deflator of goods and services											
Base case projection	14.2	9.6	9.0	9.6	7.6	7.7	6.6	7.4	6.1	6.0	6.0
Real wage maintenance	14.2	9.7	9.0	9.7	7.7	7.7	6.6	7.2	5.7	5.2	4.5
OPEC and commodity price explosion	14.2	9.6	9.0	9.6	9.2	12.9	9.0	8.3	6.4	5.6	4.0
Low monetary growth	14.2	7.5	6.7	10.2	7.4	8.1	7.0	7.9	6.6	6.6	6.5
Export deflator of goods and services											
Base case projection	15.4	10.1	8.8	8.5	8.0	7.5	6.3	6.9	5.9	6.0	6.8
Real wage maintenance	15.4	10.1	8.9	8.8	8.2	7.7	6.4	6.8	5.5	5.3	5.3
OPEC and commodity price explosion	15.4	10.1	8.8	8.5	10.3	15.0	8.6	6.7	5.1	4.8	3.9
Low monetary growth	15.4	8.1	6.6	9.2	7.7	7.8	6.6	7.2	6.2	6.5	7.1

International crude petroleum price										
Base case projection	63.5	11.1	9.7	10.6	9.4	9.2	9.0	8.8	8.7	8.8
Real wage maintenance	63.5	11.1	9.7	10.6	9.4	9.2	9.0	8.8	8.7	8.8
OPEC and commodity price explosion	63.5	11.1	9.7	10.6	15.0	35.0	15.0	8.8	8.7	8.8
Low monetary growth	63.5	11.1	9.7	10.6	9.4	9.2	9.0	8.8	8.7	8.8
(Per cent)										
Short-term interest rate ¹										
Base case projection	12.1	12.4	11.0	11.0	10.6	10.8	10.8	11.1	10.3	10.3
Real wage maintenance	12.2	12.6	11.3	11.6	11.2	11.4	11.3	11.4	10.3	10.1
OPEC and commodity price explosion	12.1	12.4	11.0	11.0	10.7	11.3	11.7	12.3	11.1	10.8
Low monetary growth	12.1	16.4	13.3	14.2	13.5	14.0	14.0	14.5	14.0	14.2
Exchange rate (U.S. dollars per Canadian dollars)										
Base case projection	85.3	85.6	85.4	84.3	83.8	83.4	83.4	82.9	83.1	83.9
Real wage maintenance	85.5	85.8	85.4	84.2	83.5	82.8	82.9	82.3	83.6	85.2
OPEC and commodity price explosion	85.3	85.6	85.4	84.3	83.8	83.4	84.1	83.9	85.1	87.2
Low monetary growth	85.3	87.1	88.8	87.1	86.8	86.1	86.0	85.2	85.2	85.2

¹ Rate on 90-day finance company paper.

SOURCE Same as for Table 2-1.

weak recovery and provides some indication of the long-run impact that the current U.S. cyclical adjustment will have on Canada. The current weakness will be reflected in the medium term in slower output and productivity growth, a larger overall government sector deficit and, in the later years of the decade, greater difficulty in reducing inflation.

The Risk of Higher Inflation

The deterioration in the price performance projected for the Canadian economy for the 1980-83 period reflects the increasingly inflationary situation in the United States and other countries. Yet we cannot assume that this is the only cause of inflation in Canada. Other influences, about which quite plausible assumptions could be made, could lead to further upward pressure on Canadian prices.

Table 2-3 shows how a variety of price indicators would move in response to three alternative sets of assumptions. While in the base case real wages fall in the near term with slow recovery thereafter, the "real wage maintenance" scenario provides an assessment of what might occur if this tendency were countered by more vigorous wage bargaining and wider use of cost-of-living increases in wage agreements and by other inflation-triggered adjustments in the administered wage sectors. The "OPEC and commodity price explosion" scenario assumes that there is a mid-decade price explosion in international oil prices and, concurrently, in other commodity prices. The "low monetary growth" scenario assumes that the rate of monetary growth is reduced from 8 per cent in the base case to 5 per cent annually.

Real wage maintenance, under which employees in all sectors of the economy try to maintain their real incomes, would add approximately one percentage point per year to the inflation rate as the decade unfolds. In fact, in this alternative, double-digit inflation would persist until 1984, whereas in the base case projection inflation drops below 10 per cent by 1982. The commodity price explosion alternative would give rise to an inflation rate of 11 per cent in 1986, compared with a rate of 8.1 per cent in the base case. The combination of the real wage maintenance and the commodity price explosion scenarios, even in the presence of low money supply growth, would hold the inflation rate at a double-digit level for a good part of the decade. In fact, in the 1985-86 period, the inflation rate for the consumer price index could top 12 per cent. Throughout the 1980s, these combined effects could raise the inflation rate 1 to 2 percentage points each year over the base case projection. The low monetary growth scenario places downward pressure on inflation in the near term, but the resulting higher interest rates depress investment spending and real growth in the long run.

These alternatives will, of course, affect other economic indicators as well. For example, the commodity price explosion would imply a worsen-

ing of the federal government deficit from 1984 through 1990 under existing oil subsidy policies. Because of the higher world oil price, the gap between OPEC and domestic petroleum prices would be larger, requiring increased oil import subsidy payments throughout the latter part of the decade. Clearly, the domestic inflation rate, government deficits, and other economic conditions are very sensitive to OPEC decisions about the international price of oil.

The Domestic Oil Pricing Issue Revisited

The worsened international economic environment, the risks of further acceleration in OPEC and other international commodity prices, and the possibility of further pressure on wages combine to create difficult conditions for Canada's policy-makers. Moreover, some policies, especially those concerning domestic oil prices, could themselves involve very difficult trade-offs.

Our base case projection incorporates the domestic crude petroleum price increases registered up to the beginning of October 1980, and it is assumed that the wellhead price will increase at a rate of \$4 per barrel per year during the remainder of the decade, although no new explicit agreement had been reached between the federal government and the producing provinces when this report was written. It also assumes that the ceiling on the Syncrude levy to guarantee approximately the world price for crude from tar sands producers will continue at the present rate of \$1.75 per barrel. Our remaining assumptions reflect the existing agreements on oil rent splits between the producers and the provinces and the federal government, and the continuation of the Import Compensation Program.

The Import Compensation Program establishes what is essentially a single price for a barrel of standard quality, crude petroleum across the country. Eastern importers are subsidized by the federal government so that their net costs per barrel are virtually identical to the price other major users – mainly refineries and electrical utilities – pay for Canadian crude. The cost of the program amounts to the difference between the landed price of imported oil averaged at Montreal and the price of Canadian crude delivered to Toronto times the volume of imports. Variations in the price for crude across Canada thus reflect only transportation cost differentials. As the volume of imports and the gap between the two prices increase, the cost of this subsidy rises; in 1980, the subsidy is expected to be \$3.2 billion. To finance the Import Compensation Program two revenue sources have been created: a special tax on oil exports approved in January 1974; and the federal gasoline excise tax introduced in the June 1975 budget. Until 1979 the revenues from these sources were adequate to cover the subsidy. As oil exports are phased out, however, additional revenues will be required to cover the deficit between

expenditures on the subsidy and the gasoline excise tax. We expect these shortfalls to escalate, thus worsening the federal deficit position.

In the base case projection the domestic price of crude petroleum is projected to be \$10 lower per barrel than the price in the United States and \$20 lower than the world price in 1980 (Table 2-2). We anticipate the price for crude petroleum in the United States will be \$44.10 by 1982, \$58.28 by 1985, and \$88.95 by 1990, reflecting the removal of controls. After 1981 the U.S. price will track world price movements. We assume the world price in Canadian dollars will advance 1.0 to 1.5 percentage points per year more than the Canadian consumer price index.

By the end of 1980 the price for crude in Canada and the United States will be below the world price. However, the U.S. price will be within 75 per cent of world price, while the Canadian price will, under our present assumptions, remain at 45 per cent of world price. Canadian prices now are 60 per cent of U.S. prices. The \$4 increase per year per barrel assumption will, in the long run, maintain this disparity between Canadian and U.S. prices.

The Canadian oil pricing decision has been made more difficult as a result of higher world prices and the stated policy of the U.S. government to remove oil price controls by the end of 1981. If it had not been for the unanticipated increases in OPEC prices during late 1979 and early 1980, the Economic Council's recommendation in the Sixteenth Annual Review to raise the price for domestic crude \$4 per barrel annually would have brought the Canadian price to close to 85 per cent of both the U.S. and the world price by 1986. Now to reach 85 per cent parity by the end of the decade, annual increases of \$6 per barrel beginning in 1981 and persisting until 1990 would be required. A \$5 per barrel increase would raise the Canadian price to 75 per cent of the world and U.S. price by the end of the decade.

Since a decision on oil pricing will have a major impact on all aspects of the medium-term outlook for the economy, we have developed four alternative oil and gas pricing projections for comparison with our base case. The changes in assumptions in each scenario follow:

- a two dollar per barrel per year (\$2/Brl/Yr) escalation rate in the wellhead price of oil,
- a "blended oil price, low gas price" scenario that also assumes that the wellhead price of oil increases at \$2 per barrel per year, but in which the price to users becomes the average cost of imported and domestic oils delivered in Toronto, weighted for their respective contributions to total consumption; the "low" natural gas price is set at 85 per cent of the *wellhead* price for oil, in terms of equivalent heat value, plus transportation costs to central Canada;

- a "blended oil price, high gas price" projection in which natural gas prices are set at 85 per cent of the *blended* oil price, which is always higher than the domestic wellhead price for oil in our projections, again in terms of heating value and including transportation costs; and,
- a "(\$4/Brl/Yr), full syncrude levy" scenario that assumes the levy ceiling will be raised in order to offset subsidies to the oil sands producers that would otherwise be payable from general revenues.

In both blended price scenarios, a large proportion of the domestic revenues that are derived from the difference between the domestic wellhead price and the blended price is assumed to be deposited in a "blending fund," which along with revenues from the oil export tax is used to offset the cost of the import subsidy and subsidies for development of frontier and new oil. We assume that by 1985 the federal government will no longer be required to dip into general revenues to support the import subsidy; the remaining subsidy will come from the producers and thus from consumers.

Table 2-4 provides a summary of the effects on real GNE, unemployment, and real disposable income of the base case and the four energy pricing policy alternatives to provide an indication of how sensitive the economy is to changing oil price policy. As the rate of increase in the wellhead price moves from \$2 to \$4 per barrel per year, there is a difference of approximately one full percentage point in the projected rate of inflation measured by the consumer price index. We conclude that for every dollar per barrel increase in the domestic price of oil under current circumstances, the CPI will increase by approximately one-half of one percentage point. Moreover, this higher rate of wellhead price increase reduces real growth in GNE by 0.2 to 0.4 of a percentage point per year. This comes about from a reduced rate of growth in real income which, in turn, is due to higher consumer prices.

Consumers might bargain to protect themselves against such income losses or the federal government might compensate them, particularly those on fixed or low incomes. If the former occurred, the decline in the rate of growth of real income in the short-run would be smaller, but the inflation rate would be higher as a result of upward pressure from increased unit labour costs. With government compensation, real disposable income would also decline less in the short term but, assuming existing splits of royalty revenues, the federal deficit would rise. The details of the impact of higher wellhead prices on federal and provincial budget balances are presented in Chapter 3. Here we note that the wider the gulf between domestic and import prices, the greater is the burden on federal revenues if an oil subsidy program is continued. It matters not whether the gap arises from more rapid increases in import prices or from hesitation in the escalation of domestic prices.

Table 2-4
Effect on Selected Indicators of Oil Policy Alternatives, 1980-1990

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
	(Percentage change)										
Gross national expenditure (1971\$)											
Base case projection (\$4/Brl/Yr)	-0.4	1.4	3.1	3.5	3.3	2.4	2.7	3.1	2.6	2.2	2.6
Petroleum price increase of \$2/Brl/Yr	-0.4	1.6	3.5	3.9	3.8	2.7	3.1	3.5	3.0	2.4	2.8
Blended oil price:											
Low gas price	-0.4	1.6	3.4	3.5	3.2	2.0	2.4	2.9	2.5	2.0	2.6
High gas price	-0.4	1.6	3.3	3.5	3.2	1.9	2.3	2.7	2.4	1.9	2.4
\$4/Brl/Yr, full syncrude levy	-0.4	1.4	3.1	3.5	3.4	2.3	2.6	3.0	2.4	2.0	2.4
Real disposable income											
Base case projection (\$4/Brl/Yr)	0.5	--	1.3	2.1	1.8	2.1	2.4	2.4	2.3	2.1	2.7
Petroleum price increase of \$2/Brl/Yr	0.5	0.8	1.9	2.7	2.7	2.4	3.1	3.1	2.8	2.6	3.1
Blended oil price:											
Low gas price	0.5	0.3	1.5	1.8	1.7	1.1	2.4	2.0	2.0	1.8	2.4
High gas price	0.5	0.2	1.5	1.7	1.6	0.9	2.3	1.8	1.8	1.6	2.2
\$4/Brl/Yr, full syncrude levy	0.5	--	1.3	2.0	2.1	1.6	2.4	2.2	1.9	1.8	2.3
Consumer price index											
Base case projection (\$4/Brl/Yr)	9.8	10.6	9.9	9.0	9.0	8.7	8.1	8.4	7.9	8.1	8.2
Petroleum price increase of \$2/Brl/Yr	9.8	9.7	8.9	7.9	7.8	8.0	7.5	7.9	7.7	8.0	8.4
Blended oil price:											
Low gas price	9.9	10.0	9.4	8.9	8.9	9.4	8.2	8.7	8.1	8.2	8.3
High gas price	9.9	10.3	9.6	9.3	9.3	9.8	8.5	8.9	8.3	8.3	8.4
\$4/Brl/Yr, full syncrude levy	9.8	10.7	9.9	9.1	8.9	9.0	8.3	8.7	8.3	8.4	8.5

	(Per cent)									
Unemployment rate	7.9	8.0	7.5	7.0	6.7	6.5	6.5	6.1	5.9	5.6
Base case projection (\$4/Brl/Yr)										
Petroleum price increase of										
\$2/Brl/Yr	7.9	8.1	7.6	7.1	6.6	6.3	6.2	5.6	5.3	5.0
Blended oil price:										
Low gas price	7.9	8.0	7.5	7.0	6.7	6.6	6.8	6.4	6.3	6.1
High gas price	7.9	7.9	7.3	6.8	6.5	6.3	6.6	6.3	6.2	6.1
\$4/Brl/Yr, full syncrude levy	7.9	8.0	7.5	7.1	6.7	6.5	6.5	6.2	6.1	5.9

SOURCE Same as for Table 2-1.

Under the blended price scenarios, which turn out to be no more or less favourable than the base case projection, the domestic price for crude petroleum would at first rise at or about the rate associated with the base case but more quickly thereafter. Under these alternatives, domestic oil would be higher priced than in the base case by 1984, even though the domestic wellhead price increases only half as fast in the blended price scenarios. In the short term then, compared with the base case, the blended price scenarios imply slightly higher growth in real GNE and real disposable income together with equal or better unemployment performance. From the mid-1980s the base case yields better performance indicators.

The gas pricing differential between the two blended price scenarios has mixed effects. The low gas price scenario would undoubtedly lead to a higher rate of substitution of natural gas for oil, but this creates only a small improvement in economic growth. Unemployment rates are projected to be somewhat lower in the high gas price projections, partly because of the added incentive to exploration for and development of natural gas resources and partly because real wages decline, thereby lowering labour force participation rates.

The fact that the blended price approach appears to have a little less impact on the CPI in the short term than the \$4 base case approach is essentially a consequence of our assumption about how quickly the federal government phases out contributions from general revenues to the oil price subsidy program. With more rapid phasing out, the effect of the blended price approach might exceed that of the \$4 per barrel path.

The essential difference between a \$4 and either of the blended price projections lies in who pays for the oil subsidy program. Under the blended price arrangement, refiners of domestic oils would pay \$2 per barrel more at the wellhead and another \$2 per barrel into the federal government's blending fund. Of course, these higher prices would essentially be passed on to consumers. Imported oil, frontier and new oil, and synthetics would be subsidized to varying degrees from the blending fund as well as from special tax levies.

By 1985 the federal deficit is projected to be approximately \$6 billion less under the blended prices assumptions. This decline could leave the federal government additional room to promote economic expansion through increased expenditures or reduced taxes, a topic we explore in Chapter 3. But the reduction in the federal deficit would be greater than the projected decline in surpluses in the producing provinces for two reasons: first, the higher domestic price puts less pressure on the blending fund; and second, the blending fund benefits from receipts from the

blended price scheme at the expense of the provinces and producers and, therefore, consumers.

Except for the effect on the federal deficit and the provincial surpluses, our results under a blended pricing scheme are very similar to those reported for the \$4 per barrel projection in the Sixteenth Annual Review. The deficit of the federal government is projected to decline substantially. The reason is that a portion of the rents that would result from higher domestic oil prices is used to finance the blending fund so that the federal oil import subsidy program fades from the accounts as does its claim on federal revenues. Because the rate at which the wellhead price for crude oil increases is constrained, lower royalties result and thus surpluses would fall in the producing provinces.

The "Syncrude levy" scenario merely reflects a means by which the federal government can ensure oil sands producers approximately the world price for their output. The levy is a general tax on all petroleum consumption, and the proceeds are used to subsidize the gap between domestic and international petroleum prices. As the levy increased, the federal deficit would be reduced, because general revenues would no longer be needed to finance this subsidy. Similarly, if higher domestic prices were accepted, there would be less need to draw from general revenues to balance the fund.

If the levy were used continually to support a world price level for the output of oilsands producers, the levy per barrel would have to increase over time, as oilsands production became an increasing proportion of total production. In fact, in the full levy alternative, inflation would be a little worse at the end of the period, since oilsands production would rise as a proportion of consumption and the gap between the world price and the price of conventional domestic production would still be large. The implied increase in the levy would put upward pressure on all domestic fuel prices. However, the use of the levy would reduce the need for general revenues to balance the subsidy fund.

As long as imports of foreign petroleum are required, the difference between the domestic and the world price has to be paid for through higher taxes or through reduced profits for producers and/or royalties for the producing provinces. The provinces have a legitimate right to seek revenues from this tax base, and their willingness to allow the development of oil and gas resources probably hinges on the receipt of perceived "fair rents." But to ensure future investments in energy, the return on investment to producers must be sufficient. Moreover, investment in alternative energy sources and conservation, as well as in fossil fuels, may well depend on higher energy prices. Since investment in energy projects is carrying an otherwise very slack economy, many important decisions are dependent upon the outcome of policy in this important area.

The Impact of Investment

Our projections indicate that except for energy-related projects, investment in the 1980s will not be buoyant. In this section we first evaluate the impact on the economy of domestic energy investment and then consider the question of investment incentives.

DOMESTIC ENERGY INVESTMENT

The base case scenario assumes that several major energy projects will be undertaken during the 1980-90 period. In addition, investment in electrical utilities is assumed to grow at 2 per cent per year from 1982 to 1990. To evaluate the importance of these projects for overall economic growth we have an alternative scenario in which the large energy projects are cancelled. Alsands, Cold Lake, the Q and M Pipeline, the Alaska Highway Gas Pipeline, and the East Coast Pipeline are all withdrawn. Only a minimum of investment activity in the present Syncrude project is assumed to be carried forward, though with no additional expansion. The rate of investment in electrical utilities is assumed to decline 1.5 per cent per year during the period. In this alternative, mining investment in crude petroleum and natural gas, which includes oil sands activity, has been cumulatively reduced by \$7.5 billion in 1971 dollars over the decade. Transportation investment, which includes pipelines, has been cumulatively reduced over the period by \$4.6 billion and utilities investment by \$5.8 billion, all in 1971 dollars.

Because of the withdrawal of the oil sands projects, domestic crude production is projected to fall over the 1985-90 period, and increased oil imports would be required to fill the gap. In the alternative, crude petroleum imports in 1990 are 110 million barrels higher than in the base case. Lack of natural gas distributional links to Quebec discourages some substitution of gas for oil, thereby further increasing petroleum import dependence.

As a result of the cancellation of major energy-related projects, and assuming that they are not replaced by other investments, GNE is projected to decline cumulatively by \$18.7 billion over the period. The peak impact occurs in 1984 and 1985 when, in each year, GNE is reduced by approximately \$2.5 billion in 1971 dollars. In 1981 the GNE growth rate is reduced by 1.0 per cent and in 1982 by 0.5 per cent (Table 2-5).

Since a large portion of the decline in energy-related investment involves construction rather than machinery and equipment, the reduction in imports, and thus the impact on the trade balance, is not as large as might be expected. But because of lower investment, a large reduction in employment is projected. A cumulative total of 753 thousand jobs would be lost over the period. At the point when the impact of the

withdrawal of energy investment would peak, the unemployment rate would be 0.8 percentage points higher than in the base case. The projected loss of real disposable income – some \$710 million (\$1971) in 1984 – would lead to a fall in consumption, thereby exerting downward pressure on GNE.

Because of the lower economic activity and therefore reduced taxation receipts, the federal deficit would increase. This problem would be further exacerbated by an increase in oil import subsidy payments in the latter part of the decade as a result of increased crude oil imports. Reduction in the tax base would also reduce provincial revenues, although not by as great a proportion as federal revenues. In the early part of the period, the current account balance is projected to improve as imports fall off. However, this improvement would not persist. The oil import bill would increase along with the current account deficit, so that by 1990 the deficit would be more than \$6 billion higher on the current account and more than \$8 billion higher on the fossil fuel trade balance than in the base case. In this alternative, because of increased dependence on foreign oil supplies – arising from reduced domestic supply and substitution opportunities – there would be further deterioration in our trade balance.

We conclude that increased domestic supply and substitution of alternative domestic energy sources for imports would bring considerable long-run improvement in Canada's balance of payments. But cancellation of many of these large projects would lead to lower growth in the early part of the decade and to a worsening trade deficit at the end of the decade. To see the real impact of not pursuing these projects with vigour, a long-term perspective – at least as long as a decade – is required.

The composition of investment in the alternative scheme provides an interesting comparison with the base case. Investment in the primary energy sector – in the oil sands, pipelines, and electrical utilities – is anticipated to amount to 25.3 per cent of total capital formation in 1980. By 1990 in the base case this proportion has increased to 33.0 per cent; when large energy projects are omitted it rises only to 29.9 per cent of total capital formation.

Questions arise about the capacity of the economy to finance the massive expansion in capital formation required by energy-related investment. When investment expands as a share of GNE, private consumption and/or government expenditure must decline, or inflows of foreign funds must expand. In the base case, the personal sector supplies 18.5 per cent of the required savings, the government sector 7.4 per cent, the business sector 64.9 per cent, and the foreign sector 9.2 per cent in 1990. In the alternative, the government sector's lower revenue base reduces its savings potential – or adds to its deficit – while foreign savings rise because of the increase in oil imports at the end of the period.

Table 2-5
Effect on Selected Indicators of the Large Energy Projects Assumption, 1980-1990

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
	(Percentage change)										
Gross national expenditure (1971\$)											
Base case projection	-0.4	1.4	3.1	3.5	3.3	2.4	2.7	3.1	2.6	2.2	2.6
No large energy projects	-0.4	0.4	2.6	3.3	3.2	2.5	2.9	3.2	3.0	2.5	2.6
Real disposable income											
Base case projection	0.5	--	1.3	2.1	1.8	2.1	2.4	2.4	2.3	2.1	2.7
No large energy projects	0.5	-0.4	1.1	2.0	1.8	2.1	2.5	2.5	2.7	2.0	2.9
	(Per cent)										
Real investment/GNE											
Base case projection	22.6	23.0	23.2	23.8	24.6	24.8	24.9	25.1	25.2	25.3	25.4
No large energy projects	22.6	22.4	22.2	22.5	23.3	23.5	23.7	24.0	24.1	24.5	24.6
Energy/Total investment											
Base case projection	25.3	28.2	30.7	31.9	32.0	32.3	32.4	32.5	32.5	32.3	33.0
No large energy projects	25.3	26.0	27.4	28.2	28.2	28.6	29.0	29.0	29.2	29.4	29.9
Unemployment rate											
Base case projection	7.9	8.0	7.5	7.0	6.7	6.5	6.5	6.1	5.9	5.9	5.6
No large energy projects	7.9	8.4	8.2	7.8	7.5	7.3	7.1	6.6	6.2	6.0	5.7
	(Billions of current dollars)										
Federal surplus or deficit (-)											
Base case projection	-10.8	-12.5	-12.8	-13.3	-11.4	-12.5	-13.4	-13.8	-13.1	-12.7	-10.5
No large energy projects	-10.8	-13.3	-14.4	-15.6	-14.2	-16.1	-16.9	-18.0	-19.6	-18.7	-18.4
Provincial surplus or deficit (-)											
Base case projection	2.7	4.5	6.1	7.3	8.7	10.0	10.5	11.0	10.4	9.7	9.1
No large energy projects	2.7	4.2	5.6	6.7	8.0	9.1	9.8	10.3	9.5	8.2	6.8

Cancellation of major energy-related investments would tend to reduce our reliance on foreign savings in the near term, but our dependence on the foreign sector would steadily grow from the mid-1980s onward. We conclude that to defer or strip away these energy investment projects is a decision that could indirectly cause increased dissaving by governments and greater reliance on foreign savings. Although increased domestic savings under our base case do not necessarily imply a reduction in foreign ownership of Canadian industry, they would imply an increased capacity to finance our own development.

INVESTMENT INCENTIVES

To study the impact of investment incentives over the 1980-90 period, we have developed three possibilities, each with a different form of business investment incentive and each involving a federal-provincial revenue loss of \$1 billion in the first year. These three possibilities are: a cut in the corporate tax rate; an increase in the investment tax credit rate; and a rise in the rate of tax depreciation (Table 2-6).

The projected effect of these incentive programs on real growth in all cases is small. In the first, second, and third years there would be a cumulative increase in growth of about 0.4 percentage points. The cumulative effect on employment would be dramatic. By 1987 the corporate tax cut could provide 156 thousand more person-years of employment. This represents a net addition of 20 thousand more jobs each year than would have otherwise occurred.

By 1987 the cumulative effect of the corporate tax cut would give rise to \$7.9 billion more investment. However, the cumulative increase in the deficit – the total tax loss over the entire period – is projected to be \$9.4 billion. The cumulative effect on retained earnings of corporations would be \$9.8 billion. The cumulative revenue loss to the federal and provincial governments would be about equal to the cumulative increase in retained earnings. A shift of savings from one sector to another is projected; governments dissave, while the business sector saves. The important issue is whether or not these savings are directed towards accumulating new physical capital. In the case of the corporate tax cuts, only three-quarters of this new savings would go towards new capital formation. For increases in the investment tax credit or tax depreciation, the projected effect would be proportionally lower.

The increased cash flow that would result from the decreased tax payments would stimulate capital formation, but on balance this would happen at the expense of an increased federal deficit. Investment incentives, at least as we view them in CANDIDE Model 2.0, do not seem to pay for themselves. They would stimulate capital formation, but at the same time they would affect the composition of savings in the system as a

whole. Of the three alternatives, a general corporate tax reduction would lead to the most favourable increase in capital formation compared to retained earnings over time.

Potential Output

Our examination of various indicators is instructive, but a second way of evaluating the performance of the economy is to compare actual with potential output. In the broadest sense, potential output is the level of output that could be produced without creating undue adverse inflationary pressures in the economy. The comparison of actual with potential output is useful for three reasons.

First, this approach focuses on levels rather than on rates of growth. In the short term, the rate of growth of actual output is a poor indicator for policy action. For example, a high rate of output growth would not indicate a need to cut off the stimulus if the economy were far from potential. Alternatively, with a low rate of growth, if the economy were near its potential, no further stimulus would be desirable. Also, by focusing on levels, attention is drawn to those policies that will encourage long-term growth, as well as those that stimulate and achieve potential in the short run.

Second, the calculation of the "output gap" – the difference between potential and actual output – is an indicator, albeit a very rough one, of the extent of policy actions needed. When the economy is near potential, any stimulus must be applied with extreme caution if inflationary pressure is to be avoided. But if the economy is far from potential, more massive and extended stimuli may be called for.

Third, this approach can indicate the nature of an appropriate fiscal structure. Ideally, the tax and government expenditure structure should be set to achieve the desired surplus or deficit at potential. By calculating potential the changes necessary to bring this structure about would be evident.

Three factors are involved in our calculation. As a first input into the calculation of potential, projections of the labour force are required. Using CANDIDE Model 2.0, we have developed two labour force projections, both of which show growth rates that decline as the decade unfolds, though they differ in the near term. Their decline is due to a more slowly growing source population as well as to an easing of the rate of growth in labour force participation rates, especially those associated with women aged 25 to 54 years.

The second and most central factor is the "noninflationary rate of unemployment," defined as the rate of unemployment that could be

Table 2-6
Effect on Selected Indicators of Investment Incentive Alternatives, 1980-1990

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
	(Percentage change)										
Gross national expenditure (1971\$)											
Base case projection	-0.4	1.4	3.1	3.5	3.3	2.4	2.7	3.1	2.6	2.2	2.6
Corporate tax cut	-0.4	1.5	3.3	3.7	3.4	2.5	2.7	3.1	2.6	2.2	2.6
Investment tax credit increase	-0.4	1.5	3.3	3.6	3.4	2.5	2.7	3.1	2.7	2.2	2.6
Tax depreciation increase	-0.4	1.4	3.2	3.6	3.4	2.4	2.7	3.1	2.6	2.2	2.6
Output per person-hour											
Base case projection	-2.3	-0.7	0.9	1.3	1.1	1.0	1.4	1.4	1.2	1.0	1.3
Corporate tax cut	-2.3	-0.6	0.9	1.4	1.2	1.0	1.4	1.4	1.2	1.0	1.3
Investment tax credit increase	-2.3	-0.5	0.9	1.3	1.1	1.0	1.4	1.4	1.2	1.0	1.3
Tax depreciation increase	-2.3	-0.6	0.9	1.3	1.1	1.0	1.4	1.4	1.2	1.0	1.3
	(Per cent)										
Ratio of investment to GNE											
Base case projection	15.8	16.3	16.8	17.6	18.3	18.6	18.7	19.0	19.2	19.5	19.7
Corporate tax cut	15.8	16.4	16.9	17.7	18.5	18.8	18.9	19.1	19.3	19.6	19.7
Investment tax credit increase	15.8	16.4	16.9	17.7	18.5	18.8	18.9	19.1	19.7	19.6	19.8
Tax depreciation increase	15.8	16.4	16.9	17.7	18.4	18.7	18.8	19.1	19.3	19.6	19.8
	(Thousands of person-years)										
Cumulative employment effect											
Base case projection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Corporate tax cut	0.1	2.2	12.1	30.3	58.4	90.2	123.8	156.2	187.5	218.2	248.8
Investment tax credit increase	0.1	1.8	11.6	28.9	51.9	78.4	108.2	138.7	170.4	204.7	242.5
Tax depreciation increase	0.1	-0.3	5.1	14.8	29.2	45.0	62.8	80.8	98.5	116.7	135.6
	(Billions of current dollars)										
Cumulative investment gain											
Base case projection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Corporate tax cut	0.0	0.1	0.7	1.6	3.1	4.8	6.5	7.9	9.1	10.2	11.3

Investment tax credit increase	0.0	0.1	0.5	1.2	2.2	3.4	4.7	5.7	6.8	8.0	9.6
Tax depreciation increase	0.0	0.1	0.4	1.0	1.8	2.8	3.7	4.4	5.1	5.8	6.5
Cumulative federal and provincial surplus or deficit (-)											
Base case projection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Corporate tax cut	0.0	-0.9	-1.8	-2.7	-3.8	-5.1	-6.9	-9.4	-12.4	-16.2	-20.7
Investment tax credit increase	0.0	-0.9	-1.9	-3.1	-4.5	-6.3	-8.7	-11.8	-15.6	-20.1	-25.6
Tax depreciation increase	0.0	-0.9	-1.8	-2.8	-3.9	-5.3	-7.0	-9.0	-11.5	-14.4	-17.8
Cumulative retained earnings											
Base case projection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Corporate tax cut	0.0	0.8	1.8	3.0	4.5	6.2	7.9	9.8	12.0	14.4	17.3
Investment tax credit increase	0.0	0.7	1.9	3.3	5.1	7.2	9.5	12.3	15.5	19.3	23.8
Tax depreciation increase	0.0	0.7	1.7	2.8	4.1	5.5	7.0	8.6	10.3	12.4	14.7

SOURCE Same as for Table 2-1.

achieved through increased demand without leading to an acceleration in the rate of inflation. This rate is essentially derived from linkages between cost pressures and the employment rate. Research carried out for the Council established that the greater the proportion of inexperienced or "peripheral" participants in the labour force the greater the noninflationary rate of unemployment.¹ Two factors will tend to reduce this share. The passing of the baby boom youth into the ranks of prime-age workers will raise the average experience level of the labour force and increasing attachment of women to work-for-pay employment will reinforce this tendency. As well, revisions to the Unemployment Insurance Act in 1977 and especially in 1978 will reduce incentives to work among peripheral participants; this again will raise the average experience level of the labour force. This feature of the future labour force is expected to lower the noninflationary rate of unemployment from 5.5 per cent in 1981 to 5.0 per cent in 1990. The calculation of this rate is a risky exercise at best, and we do not regard our estimate as final. However, we do regard it as a rough indication of the neighbourhood in which the rate will actually lie.

A third factor in the calculation is the projected rate of growth of output per person-hour, and here again we developed two possibilities. The first generates a "low potential" path by replicating the output per person hour of the base case. The second assumes a smooth increase in the rate of growth of labour productivity, removing the cyclical effects present in the base case for the 1980-83 period. This imposed smooth path averages out to a growth rate in output per person-hour of 1.4 per cent annually over the 1981-90 period—not unlike the average experienced in the latter half of the 1970s—and generates a "high potential" output growth path.

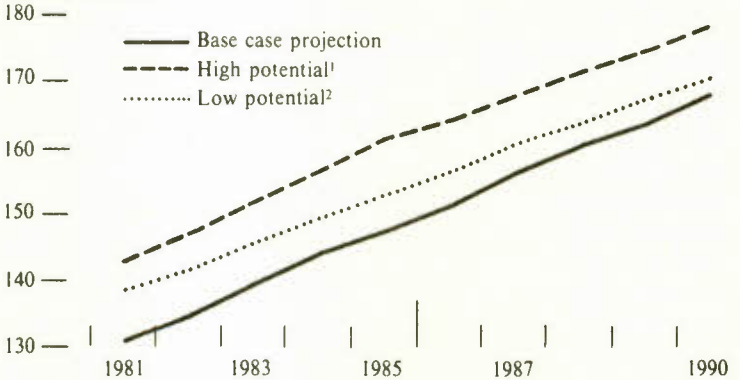
With these calculations, we use the CANDIDE Model 2.0 to generate two potential output paths that are then compared to the base case reference to derive output gap projections (Chart 2-4). The shortfalls that could develop between actual and potential real GNE are illustrated for the "low potential path," which incorporates the lower labour force projection, and the "high potential path," which uses the higher labour force projection. The gap between the potential and actual levels of output at any time measures the output and income forgone as the economy falls below its productive capabilities. If our base case and the potential projections were to hold under the low potential growth path simulation, \$8.2 billion in terms of 1971 dollars would be "lost" in 1981. Annual losses would drift downward to \$2.5 billion in 1990, with a cumulative loss of \$51.8 billion over the period. Under the high potential growth path simulation, \$12.4 billion would be forgone in 1981. Annual shortfalls are estimated to rise to \$13.8 billion in 1985 and to ease thereafter to just over \$10.0 billion in 1990. The cumulative loss over the period is expected to be \$120.8 billion.

In comparison with last year's outlook, the total output loss associated with the deterioration of the external environment in this year's base case

Chart 2-4

Comparison of Gross National Expenditure in the Base Case with That in the High and in the Low Potential Projections, 1981-1990

(Billions of 1971\$)



1 The "high potential" projection is based on the higher labour force projection and on a smooth increase in the growth rate of output per person-hour that removes the cyclical effects present in the base case for the 1980-1983 period.

2 The "low potential" projection is based on the same output per person-hour as in the base case and on the lower labour force projection.

SOURCE Economic Council of Canada, CANDIDE Model 2.0, August 1980.

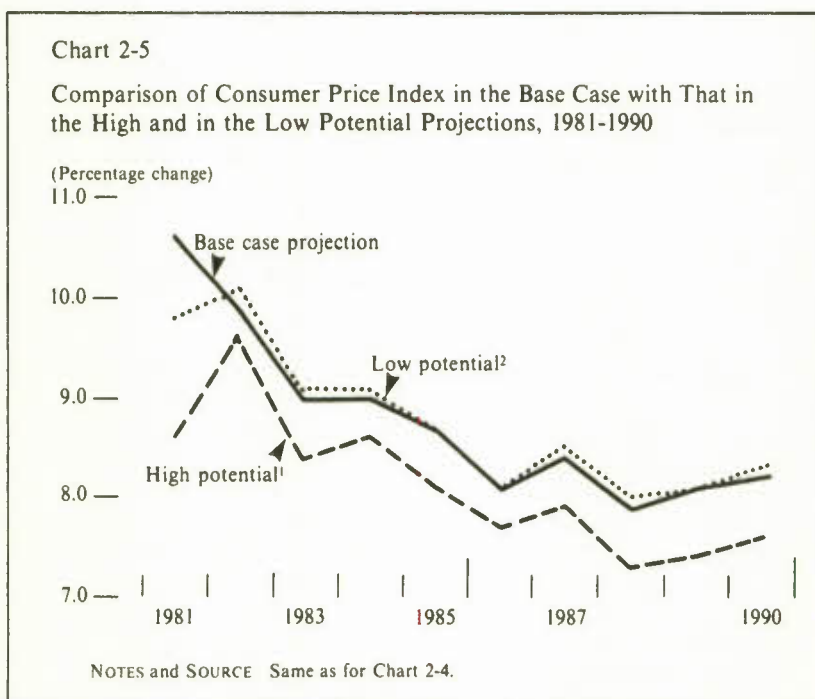
is about \$37 billion higher to 1987. This implies that, had it not been for the current U.S. cyclical slowdown, by mid-decade we could have closed the low potential output gap or closed about half of the high path potential output gap.

In addition, if it were possible to eliminate the output gap, government deficits would be significantly lower. At potential, the base case deficit for all levels of government of \$3.8 billion would become a surplus of \$2.1 billion in 1981 under the low potential path and a surplus of \$3.5 billion assuming the high path. By 1990 the projected government surplus of \$7.2 billion would be \$4 billion higher following the low path and over \$11 billion higher with the high path, remembering, of course, the very low assumed annual expenditure growth rate of 1.5 per cent in real terms. The federal deficit would shrink by \$5 to \$7 billion (41 to 54 per cent) in 1981 under the low and high potential growth assumptions, respectively, and, while there would still be a \$7.1 billion deficit in 1990 under the low potential growth scenario, under the high path a modest surplus of \$1.6 could be realized. Provincial surpluses would be between \$5 and \$1 billion greater each year under the low path scenario and positive but somewhat less under the high path assumption until 1990, when the latter would give a surplus of \$7.9 billion compared to the base case estimate of \$9.1 billion.

Both the actual and potential rate of output growth will be lower in the 1980s than in previous decades, not only because the growth rate of output per person hour will be lower but also because the labour force will be growing more slowly. In 1973 the Canadian economy was very close to its potential. Using this year as a base, the potential growth rate for 1973 to 1978 averaged 4.2 per cent each year. Over the period, actual output grew at an annual rate of 4.0 per cent.

Our high productivity projection implies a growth rate of 3.0 per cent per year from 1981 to 1990. Our base case projects a growth rate of 2.8 per cent for the period 1981 to 1990. But in 1981 the output gap – the difference in real GNE between the base case projection and the potential growth path – is projected to be 6.3 per cent, assuming a low potential path. In the base case, the economy is projected to grow at 2.7 per cent. This implies that to close the gap in one year, the economy would have to achieve a 9 per cent actual output growth rate. This calculation provides an indication of the immensity of the job required to move back to potential, even using the low potential output growth calculation as an estimate of what the economy is capable of doing.

Chart 2-5 shows the way in which the consumer price index – one reflection of price and cost performance in the economy – would behave under the base case and the low potential and high potential scenarios.



The lower potential scenario generates no easing in the inflation rate, because this path for output per person-hour is essentially the same as that in the base case and therefore unit labour costs and other pressures on prices are similar in both scenarios. In the higher potential growth scenario, improved labour productivity dampens unit labour cost pressures and the reductions in CPI growth rates are significant; on average, a one-half percentage point reduction in inflation is achieved.

This result indicates that the path for prices at high potential growth rates, the path of productivity growth at potential, and the output gap are all related. More favourable productivity performance – that is, an increase in output per person-hour – would reduce the rate of inflation but it would increase the output gap unless it was accompanied by an increase in aggregate demand, something that might be difficult in the current world economic environment.

Conclusions

This chapter has described what the Council sees as the main features of the environment facing Canada's monetary and fiscal policy-makers over the coming decade. It is not an optimistic picture, particularly for the next few years, although it assumes that there will be some, though hardly spectacular, improvement by the latter half of the 1980-90 period.

Our base case projection suggests that the annual rate of increase in the CPI will hover near double-digit levels for several years, and fall only slowly thereafter towards 8 per cent in the late 1980s. Real GNP growth should recover to a rate of over 3 per cent annually in 1982 but then average under 3 per cent after 1984 for the rest of the decade. Unemployment is projected to increase to 8 per cent in 1981 and then to decline for the remainder of the decade, in part because of the deceleration in the rate of growth of the labour force. The federal government will remain in deficit throughout the period, although that deficit will decline slightly as a percentage of GNP, and the provincial governments will maintain their overall surplus position. The current account deficit in the balance of international payments is projected to increase both in dollar terms and as a percentage of GNP throughout the decade. And, although output per person-hour will move back up by the middle of the decade, it will not return to the levels of the late 1960s or early 1970s. All in all, the base case implies only a very slow improvement in the Canadian standard of living during the 1980s.

Part of the overall problem stems from factors beyond this country's control. The worsened external environment scenario suggests how Canada's poor productivity performance and its large federal deficit are associated in part with the poor performance of its major trading partners, especially the United States. The worsening of that performance over the last year has increased the problems facing Canadian

policy-makers, particularly for the coming year or so. Conversely, rapid recovery in the economies of our trading partners would considerably improve the trade-offs we must make in the first half of the decade ahead.

Some of the other possible changes we have examined would also be clearly detrimental. An explosion of OPEC and other world commodity prices would bring still further deterioration in Canada's price, productivity, output, and employment performance as well as an increase in the federal deficit. But some other changes would have more mixed results. Pressure to maintain real wages – the real wage maintenance projection – would bring a reduced federal deficit, though at the expense of more price pressure, more unemployment, and a greatly increased balance of payments deficit. A slowdown in large energy projects would result in some easing of price and balance of payments pressures but a substantial loss in real growth during the 1981-83 period. However, delays would also hamper efforts to achieve energy self-sufficiency, create a larger balance of payments deficit in the later 1980s, and contribute to an increase in the federal deficit throughout the decade. And finally, a more rapid increase in domestic oil prices would lead directly to higher consumer prices, lower real income growth and, for most of the decade, higher unemployment. Yet without such increases, there will be further deterioration of the federal deficit and the balance of payments on current account, an increased threat to Canada's energy self-sufficiency, and an increasingly distorted industry structure.

What seems clear is that Canadians will have to keep medium- and longer-term objectives strongly in mind when weighing the short-term benefits and costs of policy alternatives. Clearly, too, the burden of the adjustments that must be undertaken to achieve the longer-run objectives would be eased if productivity were to return to higher growth rates. For example, higher productivity would mean better price performance and contribute to higher levels of aggregate demand through greater real income growth. The simulations developed through the CANDIDE Model 2.0 have indicated a number of links from demand growth and public policy to productivity performance. We turn in subsequent chapters to an examination of the sources of productivity growth in Canada – and the sources of the recent decline in such growth – using other techniques and emphasizing the supply dimension of the issue.

Our simulations have shown too that in many of the alternatives we have considered there will continue to be a substantial deficit at the federal level and a surplus at the provincial level. The presence of this disparity will put a brake on measures taken by the federal government to stabilize the economy, to stimulate growth over the longer-run, or to cushion the impact of adjustment measures on those regions of the

country that are most severely affected. In the following chapter, we examine the nature of the federal deficit and the costs, in terms of real growth, unemployment, and other economic indicators, of reducing it.

3 The Federal Deficit

The federal deficit is news. The large and increasing federal debt is now a cause of concern for some Canadians. In addition the fiscal disparity between the federal government and some provincial governments is growing as resource royalties accumulate in Alberta, British Columbia, and Saskatchewan.

Government deficits are inherently neither bad nor good. What matters about deficits is their impact on people – whether they make people tomorrow poorer in order to make people today richer; whether they create jobs or inflation today; and whether they put at risk the creation of jobs tomorrow in order to preserve jobs today. The appropriate decision on what to do about the current federal deficit depends not only on such consequences, but also on what is an acceptable way to distribute income among Canadians in different provinces and to allocate revenue sources and expenditure responsibilities between provincial governments and the federal government.

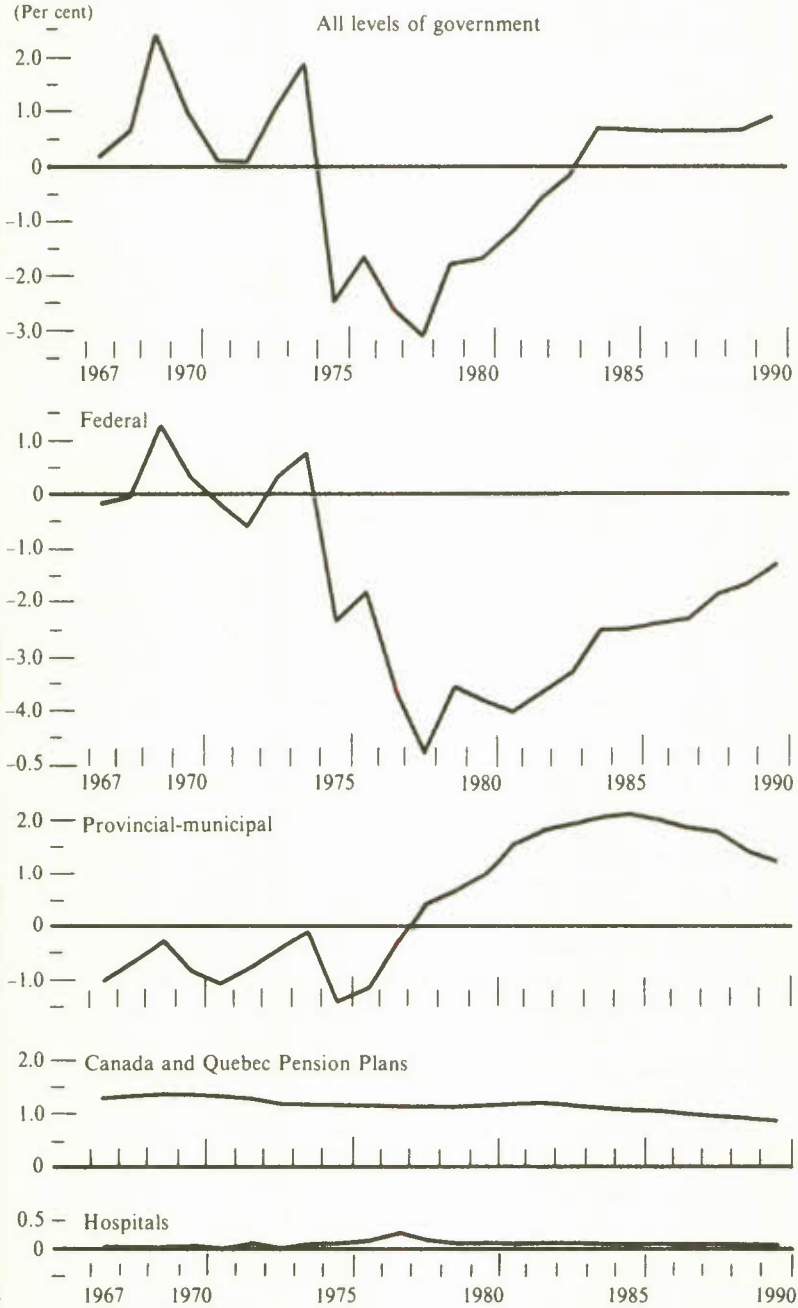
Since public opinion often tends to judge any deficit as evidence of economic trouble and sometimes as a firm proof of fiscal irresponsibility, governments might feel obliged to take action to eliminate deficits, and quickly. This chapter examines whether such action would be wise and – wise or not – what benefits and costs would be associated with a reduction in the deficit. It looks at the federal deficit and at the consequences of any decision to reduce the deficit, including the debt burden on future generations and the immediate effects on output, real income, employment, and inflation. It also briefly canvasses a number of the general arguments for and against government deficits.

THE GOVERNMENT SECTOR AND ITS COMPONENTS

The total government sector, which consists of federal, provincial, and local governments, hospitals and public pension plans, was in surplus on a national accounts basis in every year from 1967 to 1974 (Chart 3-1). Then followed five years of large deficits. The Council's base case projects a large deficit again in 1980 and 1981 but from 1982 onwards

Chart 3-1

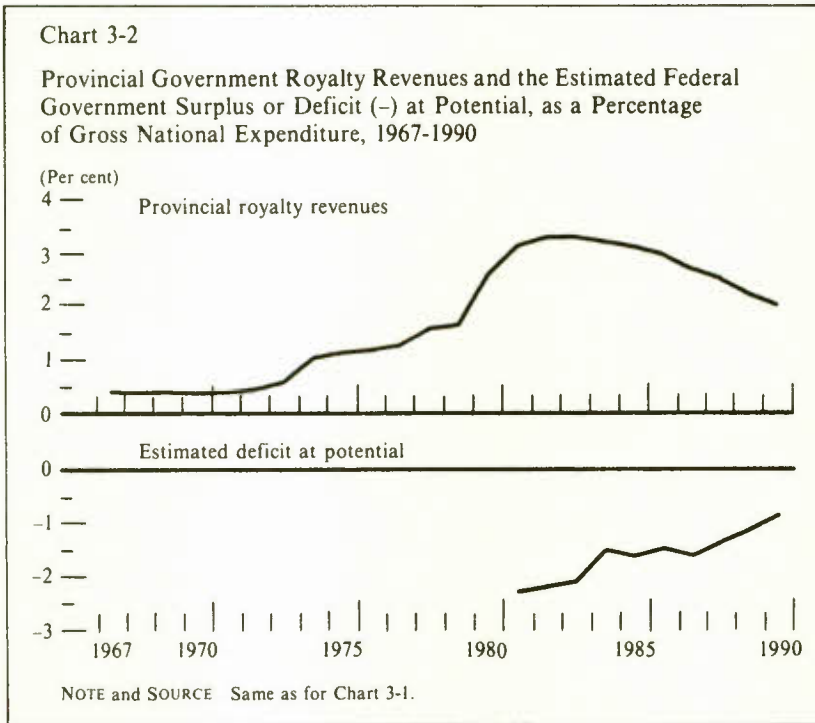
Government Sector Surplus or Deficit (-)¹ by Major Components as a Percentage of Gross National Expenditure, 1967-1990



¹ Actual surplus or deficit up to 1979; base case projections from 1980 onwards.

SOURCE Economic Council of Canada, CANDIDE Model 2.0, August 1980 and data from Statistics Canada.

the government sector is expected to have either a very small deficit or a small surplus. Factors in these projections are the large resource revenues that will accrue to the three western provincial governments and a low growth rate in government expenditures (Chart 3-2).



No regular pattern showed in the provincial fiscal position on a national accounts basis until the end of the 1970s; some years the provinces showed surpluses, some years they showed deficits. In the 1980s the provinces as a group are expected to show large surpluses, in part because of increasing resource royalty revenues. If royalty revenues were to hold at their 1980 share of GNP, the provincial surplus would be half a percentage point lower to 1987, and one-fifth of a percentage point lower over the decade, than in the Council's base case. The large amounts of royalty revenues in British Columbia, Alberta, and now Saskatchewan are creating substantial asymmetry between these and the remaining provinces. (See Appendix Table B-1 for a breakdown of the provincial deficit-surplus position by province.)

Although the federal budget was fairly close to balance in the eight years of the 1967-74 period, a dramatic change occurred in 1975. Since that year there have been large deficits. Moreover, our base case projects

both large and persistent deficits for the 1980s. They will be especially large in the early part of the period up to 1990, exceeding 3 per cent of GNP for the seven years from 1977 through to 1983. They will remain rather large even after 1983 lying about 2 per cent of GNP until 1988 (Chart 3-1).

A good part of the persistent federal deficit can be attributed to below potential performance. Moreover, because of resource royalties and a surplus on the Canada and Quebec Pension Plans, the combined deficit of all governments in Canada is expected to be replaced by a surplus from the early 1980s. However, it is the large federal deficit, rather than the overall government sector position, that is claiming public attention. We shall enlarge upon this point later. Basically, the large federal deficit stems from the fact that the burden of stabilization policy falls on the federal government. Whether the federal deficit itself should be reduced or eliminated is a pressing question. Our analysis suggests that the answer is not at all straightforward.

THE QUESTION OF DEFICITS

The simplest and perhaps for some the most forceful argument against deficits is that future generations must pay for them and that they ought not to. If the deficit is directly or indirectly financed through foreign borrowing that is not used for productive investment but for immediate consumption, then future generations will be burdened. In that case, the current generation has created a debt and interest obligation that forces it either to pay now or to penalize future generations with a debt and no additional earning assets. Deficits will disturb the distribution of income between present and future generations. If the present distribution is considered appropriate, deficits ought not to be incurred. This argument is strengthened by the observation that future generations have no voice in the decision to run a deficit.

Some push this argument further, maintaining not only that deficits financed by foreign borrowing ought not to be incurred, but also that deficits can only be financed by foreign borrowing. They reason that even if funds are not borrowed abroad directly, they must be borrowed there indirectly, because when the government issues bonds domestically it competes with the private sector for a limited supply of domestic savings, forcing the private sector to borrow abroad. Increased pressure by the federal government in the domestic capital market is often considered to "crowd out" not only private borrowers but also provincial governments, forcing them into the foreign capital market.

An alternative view is that a government deficit stimulates the economy and that the resulting higher level of activity generates more domestic savings, which in turn can be tapped to finance the deficit that brought

them about. In this situation, since the deficit is financed by additional domestic savings that would not have accumulated in the absence of the deficit, a strong case can be made that future generations will be burdened only minimally or not at all. The future principal and interest payments will be made by Canadians as taxpayers to Canadians as bondholders, so that the debt remains within the nation and, overall, the credits will balance the debits.

But if debt charges rise as a percentage of gross national product, higher taxes may then be required to finance the increased transfers to the private sector to pay the interest on the debt. The need for tax revenue for this purpose may in turn restrict the capacity of the government to spend on other transfers or on goods and services because of public pressure to keep the total tax burden down. But this will happen only if the public does not recognize that the extra interest payments expand aggregate national income by precisely the amount of the extra taxes. However, the incidence of the extra tax burden and the distribution of the interest receipts will be different, and the size of the government sector will tend to increase.

There is, of course, the possibility that those who hold funds may be unwilling to lend at sufficiently favourable rates to governments that run persistently high deficits. There has been no evidence that this has happened, but lenders have insisted on shorter duration agreements and new instruments with extendable terms. This means that the government must refinance a larger portion of its debt each year and thus it may face a debt-management problem.

A positive argument often made about deficits is that they may be necessary to avoid excessive unemployment. If demand for consumption goods and exports is low and investment demand is weak, then low output and high unemployment may be inevitable, unless the government deliberately injects more purchasing power into the system than it takes out of it in taxes. In this case, a deficit may be used to create jobs. Coupled with the argument that the resulting stimulus to private savings will mean that future generations will not be penalized, the deficit can be good for the nation. The argument proceeds that a government may even have a duty to run a deficit in certain circumstances.

Carrying these ideas further, it can be maintained that a deficit or surplus position should be chosen to keep the economy performing at all times as close to potential output as possible. That policy might result in long-run budget balance. Surpluses obtained at times of high private sector demand might coincidentally be of just the right size to offset deficits incurred at times of low private demand. But they might not be. It is also possible that operation of the economy at its full potential would require planning for budgetary deficits for extended periods, if private demand tended to be chronically weak. Alternatively, operation at full

potential might require planning for extended budgetary surpluses, if accelerating inflation is to be avoided. That would happen if private demand were chronically very strong. The key point is that a deficit or surplus position must be judged with reference to what is required, this year and in later years, to maintain the economy on its potential growth path.

Ironically enough, a currently popular argument against the present high federal deficit comes from those who accept this line of reasoning and believe that deficits are a virtue whenever they are needed to avoid unemployment and keep the economy at potential. But they contend that if the federal deficit is already large, and a need to stimulate the economy comes up, public opinion will prevent the running of an even larger deficit. The federal government would then be unable to fulfil its stabilization responsibility. The irony enters because an attempt to eliminate the deficit now, so as to preserve the future capacity to fight unemployment with deficits, might well create unemployment today. If this reasoning is correct, today's deficit is incurred at the expense of tomorrow's unemployed. Future generations would be penalized by a deficit, in a different way from just having to pay off the debt.

This last objection to a large federal deficit would lose some of its force if provincial governments traditionally shared responsibility for stabilization policy. In such a tradition, the overall government sector deficit rather than the federal deficit would be the appropriate policy instrument for society to use when fighting unemployment by manipulation of aggregate demand. Any stimulus to create jobs could be applied not only by the federal government, but also by provincial governments. And when the federal government happened to be unable to stimulate the economy, because its deficit had already become as large as public opinion could tolerate, provincial governments would sometimes still be able to do so. In present circumstances, for example, the surpluses in some western provinces could be reduced if that were thought necessary to stimulate the economy as a whole. The inhibiting effect of the large federal deficit on stabilization policy would not then exist. However, although provincial governments have from time to time engaged in stabilization activity there is no established tradition in Canada for joint-stabilization action. Consequently, the current western surpluses do not soften the "stabilization-policy-inhibiting" objection to the large size of the present federal deficit.

Federal Deficits and Foreign Indebtedness

Much controversy surrounds the question whether deficits increase foreign borrowing for non-investment purposes or whether they increase domestic savings. In the first case, a burden is imposed on future generations by a deficit; in the second case, this is much more debatable.

To throw some light on this controversy it is useful to examine the actual figures for government deficits, the level of foreign saving, and the availability of domestic saving. Generalizations about whether deficits primarily stimulate domestic saving or require foreign saving are not too useful unless supported by the facts. We shall conclude that they are not.

Typically, in Canada, private investment requirements exceed the flow of private domestic savings. The difference is often financed by foreign borrowing. If in addition a deficit is run by all governments combined, this may, directly or indirectly – by crowding private borrowers out of the domestic capital market – require additional foreign borrowing. If only federal borrowing requirements can be met domestically, the provincial governments will be forced to go abroad for funds as well. In 1976, for example, private domestic investment exceeded private sector savings by \$0.9 billion, or 0.50 per cent of GNP. Governments also ran a deficit, of \$3.4 billion, or 1.80 per cent of GNP. The total requirement for foreign savings was, therefore, \$4.4 billion, or 2.50 per cent of GNP (Table 3-1).

By definition, within the national accounts framework foreign savings must exactly equal the sum of the government sector deficit and the “private sector deficit” – the excess of private investment expenditures over private savings. If domestic savings exceed domestic investment, as they did in 1978, then the foreign savings will be supplemented by a private sector surplus, and the two together will equal the government sector deficit. Similarly, if governments run a surplus, this surplus added to foreign savings must equal the private sector deficit of savings over investment requirements.

The question then becomes how in practice the equality can be preserved when government deficits rise. If deficits go up, do foreign savings rise, or does the domestic sector accommodate by saving more – or possibly investing less? Two examples of changes in government deficits between particular pairs of years dramatize the point that the burden imposed by a federal debt varies; it may be large at some times and negligible at others.

In the 1973-75 period the overall government balance went from a surplus of 1.0 to a deficit of 2.5, as a percentage of GNP, a deterioration of 3.5 percentage points. Some 0.5 of this was financed by a fall in the private sector deficit, but the bulk, or 3.0 percentage points, was financed through higher foreign savings, or going into debt abroad. For these two years the swing to the deficit was almost 90 per cent financed by foreign debt. Those who maintain deficits lead to a foreign debt burden appear to receive strong support from this evidence, though the question whether the extra foreign saving was used for investment or current uses must still be resolved.

In the 1976-78 period, the government deficit increased 2.1 percentage points. But now some 1.9 percentage points were accommodated by a

Table 3-1

Government, Private and Foreign Surplus or Deficit (-) as a Percentage of Gross National Expenditure, 1967-1990

	Government	Private ¹	Total domestic	Foreign ²
	(Per cent)			
1967	0.2	-1.1	-0.9	0.9
1968	0.7	-1.1	-0.4	0.4
1969	2.4	-3.8	-1.4	1.4
1970	0.9	0.2	1.1	-1.1
1971	0.1	0.1	0.2	-0.2
1972	0.1	-0.7	-0.6	0.6
1973	1.0	-1.2	-0.2	0.2
1974	1.9	-3.3	-1.4	1.4
1975	-2.5	-0.7	-3.2	3.2
1976	-1.8	-0.5	-2.3	2.3
1977	-2.9	0.6	-2.3	2.3
1978	-3.9	1.4	-2.5	2.5
1979 ³	-1.8	-0.4	-2.2	2.2
1980	-1.7	-0.3	-2.0	2.0
1981	-1.2	-0.8	-2.0	2.0
1982	-0.6	-1.2	-1.8	1.8
1983	-0.2	-2.0	-2.2	2.2
1984	0.7	-3.0	-2.3	2.3
1985	0.7	-3.1	-2.4	2.4
1986	0.6	-3.0	-2.4	2.4
1987	0.7	-3.3	-2.6	2.6
1988	0.7	-3.2	-2.5	2.5
1989	0.7	-3.2	-2.5	2.5
1990	0.9	-3.4	-2.5	2.5

1 The private surplus or deficit is gross private saving minus non-financial capital acquisitions.

2 The foreign surplus or deficit is foreign saving.

3 Base case projections from 1979 onwards.

SOURCE Economic Council of Canada, CANDIDE Model 2.0, August 1980.

change in private sector investment from deficit to surplus and only 0.2 by extra borrowing abroad. In these two years, the swing to the deficit did not create an equivalent increase in the foreign debt. Instead, about 90 per cent of the increase in public indebtedness was offset by a decrease in private sector indebtedness, and only 10 per cent was covered by increased foreign indebtedness. On this evidence, those who argue that deficits create domestic savings, so imposing little or no net burden on the future, appear to be right.

Whatever the cause of the increases in the deficits, the first was mostly financed abroad, and the second mostly at home. More generally, the way deficits are financed varies a lot in practice. Table 3-1 confirms that a change in the overall government deficit is sometimes accommodated mainly by extra foreign borrowing, sometimes mainly by changes in the

balance between savings and investment in the private sector, and sometimes by a combination of the two in which each plays a significant role.

An additional possibility is that even when foreign saving is associated with a higher government deficit it may not constitute a burden if it is causally linked to extra real investment. This argument cannot be resolved by a simple appeal to the data. Even if deficits stimulate activity and so investment, the full-cycle amount of capital accumulated may hardly change, though the timing of the investment leading to it may not be the same. Thus any additional foreign saving linked to deficit financing may overstate the additional burden placed on future generations.

So far we have looked only at overall government deficits. But if the overall deficit is not systematically related to the external debt burden, there is no reason to expect that the federal deficit will be. Similarly, extra federal borrowing may not necessarily force the provinces into the foreign capital market.

Federal Deficits and Economic Performance

Our next task is to consider the consequences on our general well being of a concerted effort to reduce the federal deficit in the 1980s. To examine at least some of the implications of debt reduction, as measured by the level of output, external debt, the availability of employment, and the rate of inflation, a number of simulations were run using the CANDIDE Model 2.0. Two ways of reducing the deficit were considered: first, unilateral action by the federal government to raise taxes or reduce expenditures, or both; second, an agreement between the federal government and the provinces on the effective division of oil and gas revenues so as to divert a larger share to the federal government. In both cases the measures encompassed by the estimates were designed to eliminate or almost eliminate the federal deficit when the economy was operating at full potential. The simulations, of necessity, embody assumptions about demographic and related developments as well as structural responses within the economy, but they clearly display the direction of the effects on the measures described. Initiatives to reduce the deficit were tested against the base case projection outlined in Chapter 2.

Unilateral action by the federal government to reduce the deficit would imply a larger overall government sector surplus than that revealed in the base case projection, because the reduced federal deficits would not be accompanied by reduced provincial surpluses. The action also turns out to have rather unpleasant consequences in terms of forgone increases in income and a somewhat reduced number of new jobs, but there is a big reduction in the external debt and a small reduction in inflation.

Should the federal government take concerted action with the provinces to reduce the deficit, gains in both income and jobs and a small reduction in inflation would occur, but the external debt would rise. This option presupposes a redistribution of income from the western provinces to the rest of the country; thus reduced federal deficits would be accompanied by reduced provincial surpluses. With these redistributed revenues, governments collectively would be imposing a less stringent fiscal policy than in either the base case or the unilateral case, thereby generating extra jobs and income.

Action by the federal government to reduce its deficit unilaterally could take many forms. If a decision were taken to reduce the deficit by taxation, there would be advantages to introducing the changes by discretionary action rather than having them appear as a side-effect of inflation. A popular solution in some circles – de-indexing personal income tax – would certainly reduce the federal deficit and would give the federal government more room to manoeuvre. Given the persistence of inflation such action would significantly increase average effective tax rates. By contrast, discretionary tax increases have the effect of imposing a certain discipline on governments and of keeping the public aware of government policy.

As the main basis for examining the implications of unilateral federal action, we chose simulations that increased personal and corporate taxes in the first part of the 1980s, returning to current tax rates by the end of the decade – what we refer to as standard tax increases (Table 3-2). In addition, it was assumed that the natural resource base was to be excluded from the equalization formula, an important departure from the base case. Such a policy would allow a significant amount of deficit reduction in the first half of the 1980s without major increases in personal, sales, and corporate taxes. The strong restrictions on the growth of government spending imposed in the base case were retained.

Two other projections of unilateral action were also run using CANDIDE Model 2.0: in the first, the indexation provision of the personal income tax was removed; in the second, the indexation provision was reduced by one-half. In the projections, the major impact of both of these alternatives was to bring real income growth almost to a complete standstill.¹

The rationale for a joint federal-provincial method of reducing the deficit is not hard to identify. In the 1960s and early 1970s the federal government had the lion's share of expanding revenues, but many of the social programs that were introduced were linked to issues of human needs and opportunities and frequently encompassed provincial jurisdictional responsibility. With relatively rapid increases in the target populations, agreements were made to shift appropriate revenues from the

federal to provincial governments. But more recently, with total population growth easing and the demographic composition changing, there is expanding scope for expenditures related to stabilization and growth. Hence, to the extent that the federal government continues to carry the primary responsibility in this area, it may be appropriate to shift some of these revenues back to the federal treasury.

A major activity of the federal government that contributes to the continued deficit in the federal account is the oil subsidy program. In our previous discussion of the blended pricing proposal of the federal government, we concluded that the impact of a blended pricing scheme on end-use prices for petroleum products would not be much different from that achieved by simply raising the wellhead price of crude petroleum by \$4 a barrel each year as the decade unfolds. But the blended pricing scheme, because it devotes a portion of the revenues gained from higher end-use prices to a fund that permits the eventual phasing out of the federal subsidy program by mid-decade, will bring about a substantial reduction in the federal deficit. Since the blended pricing scheme provides for a declining contribution from general revenues to the subsidy program and would thus reduce the federal deficit, it is incorporated into what might be described as our "joint-action" scenario. Under this scheme, the existing royalty splits on the \$2 per barrel increases at the wellhead would be maintained. Only the incremental revenues would be divided differently among the producers, the oil-producing provinces, and the federal government.

At the time of writing, the possibility of a natural gas export tax was the subject of much discussion. This tax would be similar in nature to the export tax on crude petroleum, levied on the difference between the international price of crude petroleum and the domestic price. A gas export tax could be assessed on the difference between the international export price for natural gas and a Canadian exporter price, which would allow the producers \$4.25 (U.S.) per thousand cubic feet in 1981 plus the annual increase in the international price of crude petroleum to which natural gas price movements are tied. If the gas were sold, the tax revenues accruing to the federal government could total \$10 billion over the 1981-85 period, and they are included in the joint-action scheme. Since the volume of natural gas exports in our base case is expected to decline in the latter part of the period, the tax revenue would also decline. Provincial export royalties would be assessed on the field price of natural gas, which is equivalent to the export price less the tax and transportation cost from the field to the border. As a result, an export tax would reduce the field price, and provincial natural gas export royalties would be reduced accordingly.

A combination of the blended petroleum price, low gas price alternative and the natural gas export tax scheme would in the long run produce a surplus for the federal government. At the same time, it would bring

Table 3-2
Effect on Selected Indicators of Policies to Reduce the Federal Deficit, 1980-1990

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
	(Percentage of GNE)										
Federal deficit											
Base case projection	-3.8	-4.0	-3.6	-3.3	-2.5	-2.5	-2.4	-2.3	-1.9	-1.7	-1.3
Deficit reduction, standard tax increases	-3.8	-2.2	-1.7	-1.3	-1.2	-1.0	-0.9	-0.9	-0.5	-0.3	-0.1
Deficit reduction, primarily energy taxes	-3.8	-2.1	-1.2	-1.1	-1.2	-1.0	-0.9	-0.6	-0.3	0.0	0.3
	(Billions of 1971\$)										
Cumulative change in real output											
Base case projection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Deficit reduction, standard tax increases	0.0	-1.4	-3.8	-7.0	-10.3	-13.1	-15.3	-16.3	-16.5	-16.5	-14.4
Deficit reduction, primarily energy taxes	0.0	-0.3	-0.7	-1.8	-2.1	-1.6	0.5	3.2	6.2	9.4	12.9
Cumulative change in external debt											
Base case projection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Deficit reduction, standard tax increases	0.0	-1.6	-4.1	-6.8	-9.9	-12.3	-14.5	-15.7	-15.7	-14.2	-10.1
Deficit reduction, primarily energy taxes	0.0	-0.6	-1.7	-3.2	-3.7	-2.7	0.5	4.2	7.5	11.2	14.1
	(Thousands of persons)										
Cumulative employment change											
Base case projection	0	0	0	0	0	0	0	0	0	0	0
Deficit reduction, standard tax increases	0	-66	-190	-362	-553	-731	-877	-963	-999	-988	-931
Deficit reduction, primarily energy taxes	1	-31	-75	-150	-202	-217	-162	-64	49	167	289

	(Percentage change)									
Consumer price index	9.8	10.6	9.9	9.0	8.7	8.1	8.4	7.9	8.1	8.2
Base case projection										
Deficit reduction, standard tax increases	9.8	12.2	10.0	9.1	8.1	7.7	8.1	7.9	8.1	8.5
Deficit reduction, primarily energy taxes	9.9	10.0	9.2	8.6	7.9	7.9	8.7	8.3	8.4	8.4

SOURCE Same as for Table 3-1.

the position of the provincial governments as a whole from a surplus into a balanced position by 1990. But a large federal deficit would persist in the 1981-85 period. To bring about some reduction in the deficit in the five-year period between 1980 and 1985, extra fiscal policy measures were added to this alternative. First, revenues from the nonrenewable natural resource base were removed from the equalization formula. Second, increases in corporate taxes during 1981-82 and in personal taxes during the 1981-83 period were included.

As a result of these tax increases early in the decade, changes in the way primary energy taxes would be levied, and changes in who would have claims to these levies, the federal government would be able to introduce a number of large tax cuts in the personal, sales, and corporate areas beginning in 1984. In the simulation that was undertaken, most of the constraints on government spending spelled out in the base case were retained. A small difference is that federal spending on items other than wages increased faster from 1985 onwards because of the much improved federal deficit position.

THE SIMULATIONS COMPARED

Table 3-2 outlines the consequences of the two main deficit reduction alternatives – unilateral action through standard tax increases, and co-ordinated action with the provinces mainly related to energy taxes – and compares them with the base case projections from Chapter 2. The deficit in the base case is projected to peak at 4 per cent of GNP in 1981 and then slowly decline to 1.3 per cent by 1990. When taxes are increased unilaterally by the federal government, compared with the base case the deficit falls sharply from 1981 onwards; it is below 1 per cent of GNP from 1985 onwards. The size of the reduction in the deficit is about the same in the case of joint federal-provincial action as when the federal government acts alone. Although a small surplus is expected to show up in the last two years of this scenario, compared with a small deficit for the last two years in the unilateral tax increase scenario, too much should not be made of this minor difference. The two alternatives reduce the deficits similarly, as indeed they were designed to do. We re-emphasize, however, that these results would depend upon continued restraint in expenditures of all governments.

Table 3-2 also displays the effects of reducing the deficit on the real output available, the external debt, the level of employment, and the rate of inflation. Unilateral action by the federal government using tax increases has the unfortunate side effect of reducing real output. By 1987 the cumulative losses could reach over \$16 billion (1971 dollars). But future generations may benefit if this method of reducing the federal deficit is selected, because by 1987 indebtedness to foreigners would be cut by almost an equivalent \$16 billion. This is an upper limit to the

benefits to future generations, because while they would have less indebtedness to cope with, they might also conceivably have fewer real earning assets.

Our results do not mean that Canadians could reduce both the federal deficit and Canada's foreign indebtedness by deliberately consuming less and saving more in the 1980s. Rather, the line of causation would work the other way. Incomes would be lower and as a result Canadians would buy less both abroad and at home. Buying less abroad would reduce the foreign debt. But the reduction in domestic production – as distinct from reduced consumption out of unchanged domestic production – would be socially costly.

By contrast, reducing the deficit through joint action would have a positive impact on output after some early losses. After the initial hardships through to 1984, gains would follow, and by 1986 cumulative gains would outweigh losses. By the end of the decade, output would be significantly greater than under the base case. However, assuming present export and import patterns persist, this pleasant result would be accompanied by an eventual cumulative increase in the external debt of about \$14 billion by 1990. This is because the extra projected output and incomes would lead to a relatively larger increase in spending, so that future generations would take on a proportionately larger foreign debt. Once again, this is a maximum estimate of the increase in foreign burden, for there may be some offsetting capital accumulation whose benefits, to the extent they occur after 1990, are not captured in our output projections. As before, the debt increase occurs not because more is being consumed out of a given amount of output, but because higher output leads to larger expenditures both at home and abroad.

The effects on employment of the two alternative ways of reducing the federal deficit are very similar to their effects on output. Unilateral action would lead to a large loss in the number of jobs created, cumulating to almost 1 million by the end of the decade, for an average of about 100,000 a year. The unemployment rate would increase on average by 0.3 percentage points as a result. This is less than might appear from relating the job loss to the labour force; it occurs because the participation rate tends to fall sharply when employment does. "Hidden unemployment" is thereby increased. Joint action, on the other hand, would lead to job gains over the decade as a whole, totalling cumulatively about a quarter million, although initially they would be preceded by losses. Only towards the end of the decade do the gains outweigh these initial losses.

The effects on inflation of either set of measures to reduce the federal deficit appear small over the long haul. Unilateral action would initially raise inflation by 1.6 percentage points in 1981 and by 0.1 points in 1982 and 1983. Then the inflation rate is projected to fall to 1.6 points below the base case in 1984 and an average of 0.5 points below in 1985-86.

From 1987 to 1990, on average, it is unchanged from the base case. Over the entire decade the decline in the rate of inflation would hardly be significant, despite the slower growth of output. Joint action is projected to cut the inflation rate over the first six years, 1981 to 1986 by about 0.5 percentage points a year. But in the last four years inflation picks up to a rate of about 0.3 percentage points a year above the base case. Nonetheless, even though the differences would be quite small, over the decade the joint-action scenario succeeds in combining a lower rate of inflation with a higher rate of output than is evidenced in the unilateral action or base case models.

In sum, compared with the base case, the unilateral scenario offers an earlier and more substantial reduction in the federal deficit, along with a lower rate of foreign debt creation and a small reduction in the inflation rate. The costs inherent in the unilateral action scenario, however, are worrisome. They include a rather large decrease in an already low real output growth rate, a small increase in an already high unemployment rate, and a rather large decrease in an already low job creation rate.

The joint action alternative also offers a much quicker reduction in the federal deficit than the base case, but with more promising results. There is a delayed but rather large increase in real output growth rate, a small decrease in the unemployment rate, a moderate although delayed increase in the job creation rate, and a slight improvement over the other two cases in containing inflation. One worry associated with this course of action is the increase in the already high incidence of foreign debt. The joint-action scenario also engenders a substantial redistribution within Canada of the gains from the oil and gas endowments of some western provinces – a redistribution that helps to ease the budgetary position of the federal government in the latter half of the 1980s and allows it to relax an otherwise very tight expenditure policy. This in turn contributes to the increase in output and incomes and in the creation of jobs. Of course, in the practical realities of federal-provincial relations, the necessary redistribution of resource revenues may require very hard bargaining indeed.

Politics and Fiscal Disparities

To this point we have not discussed, except in passing, whether the federal government should share responsibility for deficits or their reduction with the provincial governments. To some Canadians this question may not seem very important, since the issue revolves around which government first gets hold of tax revenues, rather than their total tax bill. But it is important indirectly. As long as the distribution of revenue and expenditure responsibilities appears inappropriate to either level of government, effective policy-making may be more difficult. Although we cannot settle the question of sharing responsibility here we touch briefly

upon some of the issues, and hope to expand upon them considerably in our next review.

It seems to us that the federal-provincial relationship is based on three considerations – fiscal responsibility, the division of powers, and equalization. The principle of responsibility of itself would dictate that each government has an obligation to match its own expenditures with its own taxes and borrowing. Under this principle, if the federal deficit ought to be reduced, then the federal government would be solely responsible.

Following the principle of the division of powers, certain fields of expenditure and certain kinds of revenue are traditionally or constitutionally reserved for one level of government rather than another. This principle may be justified on various grounds, including the political desirability of preserving the independence of the different governments in certain areas of responsibility. Very substantial adjustments have been made over time to the federal and provincial shares of various revenue sources and expenditures. But in the absence of rapid and mutually agreed upon adjustments to relative expenditure responsibilities and revenue rights, the principle can lead, even when the overall degree of balance is satisfactory, to unwelcome deficits or surpluses in individual provinces or at the federal level. This “fiscal disparity” can then be argued to be an outcome of the rules of Confederation. Under this argument, no government’s deficit or surplus can be considered its sole responsibility.

While reserving judgment as to what proportion, if any, of the present federal deficit can be explained by the current division of powers, the implication is that if a decision to reduce the federal deficit were made, the duty to raise taxes should be shared by the provinces. Even if it were decided to hold the federal deficit at the level in our base case, it might be appropriate to reallocate the burden by adjusting tax and expenditure responsibilities to reduce the deficit at the federal level. Correspondingly, where deficits exist, they would rise, and where surpluses exist, they would fall. If the federal deficit were to be reduced, whether as a matter of stabilization policy or for other reasons, the appropriate approach might be to expect the provinces to share the responsibility, in which case the system might move into fiscal balance. Such a procedure need not, of course, imply that provinces normally should share stabilization responsibility, although it is conceivable that the time for this is not far off.

The third operative principle on which the federal-provincial relationship depends is the notion that nation-building requires richer provinces to share the cost of government-provided goods and services in poorer provinces – or equalization. In recent years the oil price equalization scheme has temporarily extended this income-sharing principle. It has had the effect, by holding the price of western oil down, of distributing some of the oil income gains in parts of the west to the rest of the

country. It may or may not be appropriate to continue this extension of the income-sharing principle if oil prices have been moved to world levels. But if the gains continued to be shared, there would be benefits to the rest of Canada beyond the income sharing itself. They consist of the kind of gains in output and employment associated with our joint deficit reduction scenario. In effect, the extension of the income-sharing principle to oil revenues happens also to be an indirect way of assigning part of the responsibility for reducing or maintaining a federal deficit to some of the provinces.

Conclusions

This chapter began by considering the question whether the government would be wise to reduce the federal deficit. After examining certain variables, we conclude that the answer depends on how a reduction in the deficit will affect the debt burden imposed on future generations, the performance of output, employment, and inflation, fiscal flexibility, and political harmony within Confederation. Three courses of action were examined: reducing the deficit by unilateral federal action through tax increases; reducing the deficit by joint federal-provincial action requiring an increased federal share of oil and gas revenues; and leaving the deficit at the high level of the base case that exists in spite of strict assumptions about government expenditure growth.

None of these three alternatives is unambiguously superior to any other. The first – unilateral federal action – cuts the debt burden on future generations considerably, yields a very small reduction in inflation, and will permit greater flexibility in future counter-cyclical policy. But it reduces output and employment during the 1980s substantially. The second – joint federal-provincial action – increases output and the number of jobs created over the 1980s, although these benefits appear only mid decade, after some losses have occurred. This option, too, would restore some flexibility to future policy and would reduce inflation minimally. But it would impose a substantially higher burden on future generations and would require real income transfers among Canadian regions that may be difficult to negotiate. The third – letting the deficit remain at the levels in our base case – is the mirror image of the others. Compared with deficit reduction by unilateral action, the base case forgoes a chance to reduce the burden on future generations and to increase the flexibility of future counter-cyclical policy but it avoids output and employment losses. Compared with deficit reduction by joint action, the base case results in output and job losses and less fiscal flexibility in the future, but the burden of debt on future generations and the risk of federal-provincial disharmony would not be heightened.

Any decision about reducing the deficit ultimately comes down to a question of hard judgment, because no course of action is clearly superior

on all counts. Our own judgments about the six factors involved – the degree of future indebtedness to foreigners, the level of real output, the level of employment, the rate of inflation, the future flexibility of fiscal policy, and the degree of federal-provincial harmony – lead us to conclude that:

- The federal deficit should not be regarded as such a large, immediate problem that reducing it through federal action alone below the trend set out in the base case should be given absolute priority over other objectives under current circumstances.

- The reduction of the federal deficit should be set as a target, in the expectation that opportunities to reach that goal will emerge or be created over the next few years. Cyclical recovery of the Canadian economy will contribute to this deficit reduction target, as will medium-term growth in the Canadian economy and resource revenues.

- While there is little evidence that the federal deficit is “crowding out” investment now, if the federal deficit is not substantially reduced when the share of private sector investment in GNP grows, crowding out and/or large spillovers into foreign financing could result.

- If government expenditures as a share of GNP grow rather than hold fast or decline over the medium-term – a decline is projected in the base case set out in Chapter 2 – then taxes should be increased and a trend towards larger government deficits should thus be eschewed, except to the extent that public investment for future earning takes place.

- The fiscal position of the federal and some provincial governments should be strengthened to redress the fiscal disparity between them and the provinces with surpluses. In fact, some portion of the surpluses from British Columbia, Alberta, and Saskatchewan will need to be shared.

One of our central arguments is that the combined deficit of all levels of government in Canada is not the cause of this country's current economic problems. Neither unusually large creations of money nor unusually large external borrowing have taken place; and investment does not appear to be crowded out by high real costs of capital compared with real rates of return. By past standards private sector saving is high compared with private sector investment. However, it is probably also true that the use of foreign saving is a bit high compared with the limited government sector investment at the present time and thus, to some extent, the dead weight external debt service obligations for the future continue to be built up.

Output would be lower and unemployment higher if discretionary actions were taken under current circumstances to reduce substantially and quickly the combined deficits of all Canadian governments. Deficits are, of course, heavily concentrated at the federal level; the surpluses are spread among a few provincial governments. The position of the rest of the provincial governments falls somewhere in between. The federal

government, with the predominant mandate for general economic policy, feels that it has little room to manoeuvre. The fiscally strong governments are clearly not offsetting the federal deficit with fiscal stimuli.

Another of our arguments is that if the expanding investment needs for the future must be met, a limit or reduction in the use of foreign saving is desirable, and the easy enlargement of the present high rate of private business and household savings in Canada is unlikely. When investment begins to increase again, it may be possible to reduce the deficits of all governments taken together and thus facilitate the domestic financing of investment. As the economy moves towards potential, the government deficits will be reduced, providing of course that expenditure restraint is maintained. Also, in many instances, government will be able to collect an increasing share of the expanded resource revenues derived from the rising world price for oil. External debt service burdens and foreign exchange risks can be reduced, too, to provide a broader scope for Canadian economic policy. Finally, the division of the continuing deficits and surpluses between the federal and the provincial governments will have to be adjusted or new fiscal arrangements will have to be worked out in due course.

4 The Productivity Puzzle

So far we have not said very much about one of the most worrisome aspects of Canada's recent economic performance: the slowdown in the growth of productivity. For eight years now, there has been very little improvement in the efficiency with which the economy uses its resources. An understanding of the causes of the productivity slowdown is vital if effective policies to deal with it are to be developed.

Our work on the subject has led us to conclude that only about half of the productivity slowdown can be explained at the moment. Weak demand associated with downswings in the business cycle is apparently the single most significant contributing cause. The other half of the explanation remains a puzzle. We are, however, quite optimistic that our own ongoing studies, and work in other places in Canada and in other countries, will eventually solve the puzzle, as several plausible candidates for an explanation exist. But before going on to examine them, it is essential to be clear about what we mean by productivity.

Productivity is a familiar measure of economic performance. But familiarity with the term has often meant confusion about the concept. Mention productivity – or the lack of it – and people are likely to become defensive. The implication is that people are not working as hard as they could.

Economists themselves may be partly to blame for the confusion. They have used the term “labour productivity” as a kind of shorthand for an idea that involves much more than how a given amount of production relates to the amount of labour that is required to produce it. Productivity is a much more complicated concept. Indeed, we go to some length later in this chapter to distinguish between “labour productivity” and what economists refer to as “total factor productivity,” or the efficiency with which all production resources – workers, factories, machinery and equipment, and management skills – are combined to produce output. Measurement of productivity involves an assessment of both the quantity and quality of those resources in relation to output. More efficient use of resources can result in productivity improvement.

The importance of the concept is clear. The higher Canada's productivity, the higher its standard of living, unless the country's terms of trade deteriorate. If output can be increased by using the same combination of resources more efficiently – an increase in productivity – it becomes possible for some people to consume more without doing so at the expense of others. But if output is increased by using more of some resources, then someone has to pay. For example, unless productivity improves, the only way for workers to receive higher real incomes would be to work more hours or to increase their wage rates. But, a wage increase without productivity improvement is really just a redistribution of income – one group gets more only to the extent that another group gets less.

This example suggests another reason why productivity growth is important – it may help to reduce social conflict. When productivity rises, there is a social dividend to be distributed. This distribution eases the tension between groups who are all competing for a share of the income pie. When productivity fails to rise, the struggle over income shares may become more intense.

Similarly, it has been suggested that when productivity growth decelerates, political and economic bargaining over income shares can contribute to inflation. This will happen if some of the bargaining groups seek to keep their real incomes growing at a rate of growth of productivity that is no longer being sustained. If such demands are met through accommodating monetary and fiscal policies, inflation will result.

Just as productivity growth can reduce the conflict over how to divide up the income pie, it can also ease the choice between producing more goods and services for private consumption or using the resources to contribute to public programs. If resources are employed to combat pollution, for example, measured productivity will be reduced. But the more efficiently resources can be used to produce the goods and services needed, the easier it will be to direct some of these resources towards enhancing welfare.

International comparisons are important too. If Canada's productivity is not growing as fast as that of other countries, export markets could dry up, and imports may become more attractive than domestically produced goods. Improved productivity growth could make Canadian goods more competitive in international markets and may help to improve the balance of international payments.

Over the past seven or eight years, growth in labour productivity in Canada and in many of this country's trading partners has been much slower than it was in the decade or so before that (Chart 1-4). The consequences are significant. If previous high rates of labour productivity growth had been maintained, Canada's domestic production in 1979 would have been nearly \$19 billion greater than it was. And in the

six-year period from 1974 to 1979, Canadians could have had nearly \$58 billion more to spend on private consumption and social programs. Both of these amounts are in constant 1971 dollars.

Poor productivity performance has meant lower real incomes and higher prices for Canadians. If the kind of productivity growth experienced in the fifteen years up to 1973 had been maintained throughout the 1970s, Canada's total output – the total of goods and services available for all uses – would have been about 14 per cent higher in 1979 than it actually was.

Over the past few years, the economy has experienced stubborn problems that have failed to respond to economic policy initiatives. Slower growth in real incomes, a high rate of price increases, a large and continuing deficit in the balance of international payments and high unemployment have all been persistent problems. Improved productivity growth might help to resolve some of them.

We should caution here that achievement of productivity growth is not without cost, at least in the short run. At any particular time, the benefits of improved productivity performance may not be evenly distributed. Technological change that would improve productivity may also mean the displacement of some workers in the short run. Compensatory policies to deal with these effects would be necessary to ease the adjustment process.

But to see how productivity growth could be improved, we must first understand what is behind productivity changes. In the next two chapters, we look at Canada's productivity performance over the past few years in an attempt to answer several pressing questions. Is it possible that the poor productivity performance experienced recently is only a temporary phenomenon, the result of the swings in economic activity that characterize the business cycle? Or are there more serious underlying problems that reflect an increasing inability of the economy to adapt to changing circumstances? Of course, some avenues to improve productivity may now be closed. The shift of resources from agriculture to other industries, for instance, has already taken place, so not much more can be gained from this particular adaptation in the economy.

Changing circumstances are certain to be a permanent feature of existence in the 1980s, particularly with the prospect of continued escalation in energy prices. It will be important, then, to distinguish between the temporary factors that have influenced Canada's productivity performance and the more serious, longer-run concerns. Policy-makers will then be in a better position to consider appropriate measures.

Many of the elements that determine productivity can be readily identified. It is much more difficult to measure these components so that

productivity growth in different firms and different countries can be compared and so that the reasons for sluggish productivity performance can be pinpointed and corrected.

How do we measure productivity? When such diverse resources as workers, raw materials, machinery and equipment, factories, and management skills are all involved in the production process, what measurement can be developed that would relate these to output and indicate the efficiency with which these resources are combined?

And how can we even measure output when so many different goods and services are being produced? How can we add up the output of houses built, loaves of bread produced, clothes cleaned, and courses taught, for example? The simplest answer to this problem, of course, is to reduce them all to a common denominator by measuring their dollar value as set in the "market." But this becomes complicated in some cases where there is no "market" to set a value on them. How do you measure output of the public service? And if output cannot be measured, how can productivity growth be ensured? Could it be that the increasing importance of the service sector in Canada has reduced measured productivity growth?

If the productivity measurement is somehow related to the dollar value of goods and services produced, it will be important to identify what part of the increase in the value of output reflects only price increases and what part is a result of increased quantity or improved quality. It may be harder to estimate whether or not there has been any improvement in the quality of output. More sharply defined television pictures and more durable clothing are examples of improved quality. If measures of output underestimate this kind of improvement, they may miss some part of productivity growth. One solution is to divide the value of output by a price index so that the effects of rising prices are taken into account. At the very least, we will then know how much of the increased value is a result of more goods or services being produced.

There is a further problem with adding up the value of all the goods and services produced. If we total the values of all the things that go into the production of even a simple product such as a loaf of bread – the grain, flour, packaging, wages of the workers, the wear and tear on equipment – as well as the value of the final loaf, we would be counting some of those costs more than once. The total cost of growing the grain, carting it off to the flour mill, milling it and transporting it to the baker, and so on, does not really give us an accurate measure of the value of the loaf of bread that is produced. The value of steel in cars, for example, would be counted in the output of cars and in the output of iron and steel.

The statistician's answer to this problem has been to measure only the value added at each stage in the production process. The sum of all the

values added at each stage will measure the net output of a firm, and all the net outputs together will indicate the net output of the economy as a whole. Some people believe that this method is the only accurate way to look at changes in the productivity of the economy.

But this method has its problems too. As a way of measuring the efficiency with which all production resources are combined – that is, “total factor productivity” – it works well as long as the proportions of materials, energy, labour, and capital do not change. But if, for example, more energy or other materials are used in relation to workers, and this is not taken into account, then our measure of total factor productivity may turn out to be too high.

Alternatively, the method would work if we assumed that materials and energy can be used interchangeably with labour or capital. Since this too is unlikely to be possible, except in limited circumstances, the value added approach is not an appropriate way of measuring the total factor productivity of individual firms or industries.

Measuring the amounts of the different resources that are combined in the production process is not easy either. Even if we could develop some kind of standard measure or unit that would allow us to add up all the different kinds of machinery used in the production process, how would we allow for the fact that a ten-year old machine might be less productive in combination with labour than, say, a new machine? And even new machines may not be standard in terms of the technology they represent.

Nor are workers standardized. Their education, training, experience, and skills will differ. Some people have suggested, for example, that the increased participation of women and young people in the labour force may be a reason for slower productivity growth, because these workers may have fewer skills and less experience. Our work indicates that the changing composition of the labour force is not a cause of the productivity decline.

In spite of all these difficulties, it is obvious that we must have some measure of productivity that will allow us to monitor the progress of the economy in making more efficient use of its resources. And it will be important for individual firms to be able to keep track of their productivity performance. Economists have often measured productivity simply by the value of what is produced related to the number of workers and hours it took to produce it. Data for this calculation of output per employee-hour are available with only short time lags so changes over time can be identified quite quickly.

Economists refer to this measure as “labour productivity” and they frequently use it as the indicator of the productivity performance of the economy. But by itself this measure may be misleading. When “labour

productivity" slows down, it may not have anything to do with labour. Suppose that output per employee-hour does, in fact, start to slow down. It could be that less experienced or less well-educated workers were being used and thus they were not able to produce as much in the same time as more experienced or educated workers. But it could also be that machinery was getting old and therefore not functioning as well. Or it could be that management had been slow to implement new ideas or new ways of organizing production, so that growth in output per employee-hour lagged behind other firms or other countries.

If "labour productivity" improves, it may be because more of some other production resource is being used in relation to the same number of workers. But it may also be that the different production resources, or inputs, are being combined more efficiently. Such an improvement in general efficiency will result in higher output not only in relation to a given amount of labour but also in relation to a given amount of the other resources that go into production. Since all these "factors of production" become more productive, the improvement is referred to as an increase in "total factor productivity." General references to "productivity" in this report can be taken to mean "labour productivity." But even if we are focusing on "labour productivity," we should analyze it within a total factor productivity framework that will distinguish the effects of all such influences on output per employee-hour.

Any analysis of "total factor productivity" on an economy-wide basis has to be related to three main "factors of production": labour, capital – the factories, machinery, and equipment used – and "intermediate inputs," such as raw and processed materials, components, and energy. But to avoid double-counting of productivity for the economy as a whole, these "intermediate inputs" are only included if they come from outside Canada.

The problem of double-counting does not arise when we measure productivity in an individual industry or firm. Total factor productivity growth at this level would then mean the growth in output per unit of all the production inputs including labour, capital, and intermediate inputs.

Labour productivity and total factor productivity are, of course, inter-related. Total factor productivity is really a "weighted average" of the productivities of all the individual factors of production; that is, it takes into account their relative shares in the production process. The rate of labour productivity growth depends, among other things, on the rate of total factor productivity growth and the rate of growth of the other production inputs in relation to labour.

From a policy point of view, it is important to distinguish between the different sources of growth in labour productivity. If a recession causes a drop in output and a falling off in productivity growth, or if productivity

growth slows down because capital growth has slowed, it is relatively easy to identify the causes and to remedy them through broad economic policy measures. But if labour productivity grows more slowly because growth in total factor productivity has slowed, the problem is more serious, because it may be much more difficult to identify the cause and take corrective action. What we know about changes in total factor productivity indicates that any remedies will be slow and complicated, because they will have to deal with individual industries and even firms. In this case, changes in broad economic policy will not help much. It becomes clear, then, that establishing whether or not Canada has experienced a slowdown in total factor productivity is not an argument that should be left to academic consideration; it is a vital policy matter.

Our approach in this Review, unlike much of the previous work in this field, is based on an analysis of productivity at the level of the individual industry or firm. Recent contributions to the field of productivity measurement, stressing this micro-economic approach, have led to a greater appreciation of the interrelationships among the various factors of production. The analysis in the following chapters is based on the growth in total factor productivity rather than on that in labour productivity alone. By focusing on the individual industry or firm, it is possible to link productivity with the way in which firms actually operate to minimize their costs. We can also gain a better insight into the process of adjustment to economic change.

The myriad of possible reasons for changes in productivity performance highlight the difficulty of measuring productivity and in identifying where policy-makers should direct their attention. The next two chapters attempt to unravel some of these difficulties and to point to areas of concern that must be addressed if Canada's productivity performance is to be improved.

5 Explaining the Productivity Slowdown

For the past eight years now, Canada's productivity has scarcely improved at all. The slowdown is remarkable for its length and it is remarkably disturbing too. The problem is worldwide – productivity growth in the United States, western Europe, and Japan has also fallen.

For a generation after the Second World War output per employed person in Canada rose very rapidly by historical standards, increasing at a rate of 2.5 per cent a year, compared with about 1.5 per cent a year in the century before.

It is important, however, to distinguish between temporary slowdowns and speedups in productivity growth and longer-term trends that may signal some permanent change in the productivity performance of the economy. Usually, when a recession occurs the rate of productivity growth slows down, not because the economy's ability to produce more goods and services is hampered, but because demand, and thus the ability to sell more, are temporarily curtailed.

In the mid-1970s when the latest slowdown in productivity growth became apparent, it might have seemed reasonable to suppose that Canada was experiencing just a temporary failure of demand to grow. Although the economy was very near its potential in 1973, it has not reached its potential since then. With the benefit of hindsight, we are less inclined to believe that the main problem, either in the mid-1970s or now, was a failure of demand to grow at the same rate as potential output. In fact, the rate of growth of potential output has itself declined.

National aggregate data suggest that the decline in productivity growth began in about 1973-74. This is generally confirmed by the detailed industry data we have examined. Since this was about the time that world energy and commodity prices began rising sharply, some analysts have suggested that these sharply higher prices may be the cause of the productivity decline.

Others point out that productivity growth always slows down when aggregate demand is weak. The total output of the economy grows more

slowly or even starts to decline if there is a recession, and production is less efficient because the economy is operating below capacity. Firms may be reluctant to lay off workers during periods of temporary demand weakness, because the costs associated with firing and hiring may be greater than what could be saved on wages. This kind of labour hoarding will also reduce labour productivity, or output per person-hour.

A slowdown in the rate at which new factories are built or old ones expanded and in the rate at which new machinery and equipment is acquired may also explain the deterioration in productivity growth. The development and application of new technology may also be proceeding at a slower pace and thus contributing to slower productivity growth. Other explanations for Canada's poor productivity performance have been offered too: the increasing importance of the service sector in Canada may have reduced measured productivity growth; improved quality of output may not have shown up in measured productivity growth; the shift of resources from previously low productivity areas such as agriculture has slowed or stopped and this kind of avenue to improvement in productivity is now closed; a higher percentage of workers who have less skill and experience may have reduced productivity growth; and some government activities, such as those diverting resources to deal with pollution, may have reduced measured productivity.

As part of our study of productivity, we have looked at changes in output and inputs in eight nonmanufacturing and twenty-two manufacturing industries.¹ We have not attempted to estimate output on the "value added" basis mentioned previously; rather, we have based our work on the gross output of each industry. But because some part of each industry's output is used in producing the output of other industries, the total output of all industries using this measure adds up to more than the gross national product.

Productivity Growth by Industry

Our analysis of productivity growth covers the period from 1958 to 1976. In examining the recent productivity slowdown, we have concentrated on the years between 1973 and 1976. Admittedly, this is rather a small span of time from which to generalize about changes in productivity growth rates. Year-to-year differences in the rate of change are large enough historically that data for three years do not establish a trend. But we know that the 1974-76 slowdown has persisted into 1980, both in the Canadian economy and worldwide. Unfortunately, data that would permit a full analysis of individual industries are not yet available for the years after 1976. Our work in this area is continuing.

Chart 5-1 shows how much overall productivity growth has declined. The numbers are based on the average of data from all sectors of the economy. Because of double-counting, the figures will not match similar

calculations for gross national product, but the story they tell is very similar. From 1974 to 1976 the rate of growth of output per person-hour – or labour productivity – was very much lower than that in the period from 1958 to 1966 or in the period from 1966 to 1973. The figures on intermediate inputs measure the output of various industries used by other industries in their production. They, too, show a sharp drop. The growth rate of capital per person-hour comes out much better with only a small decline in each of the periods shown.

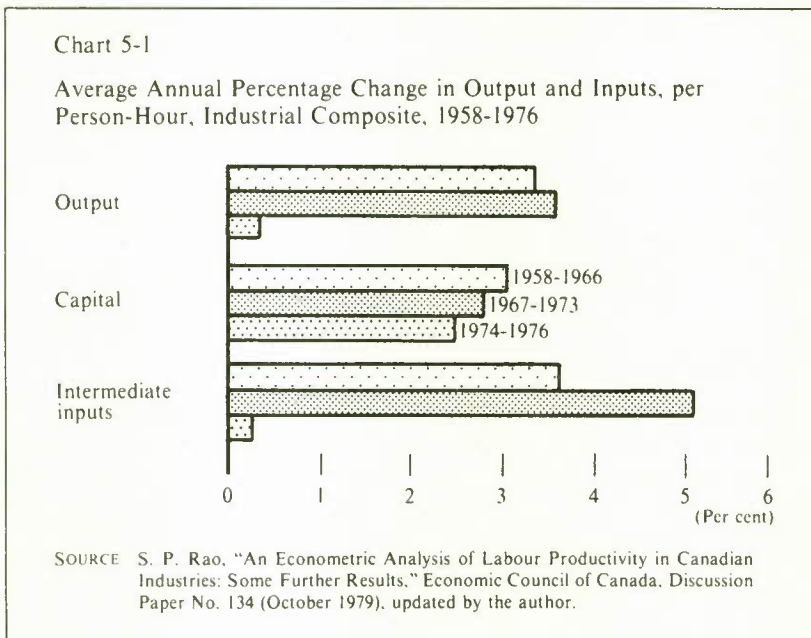
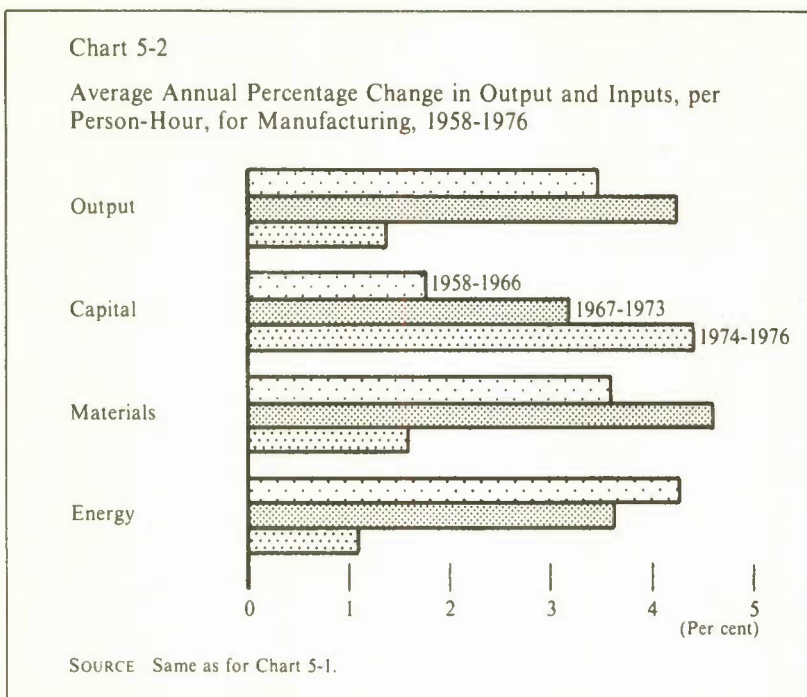


Chart 5-2 shows changes for the manufacturing sector, itself an aggregate of twenty-two individual industries. Output per person-hour dropped sharply in the 1974-76 period, as did the growth rates of materials and of energy per person-hour. But capital per person-hour in manufacturing actually increased slightly faster from 1974 to 1976 than it did from 1967 to 1973 and was growing considerably faster in both those periods than from 1958 to 1966.

Productivity of industries in the primary sector of the economy actually declined in the 1974-76 period, and the growth rate of capital per person-hour slowed considerably in contrast with what happened in the economy as a whole (Table 5-1). Productivity grew more slowly in the service industries, while the rate of growth of capital per person-hour rose in three of these five industries and fell in two. In construction productivity growth slowed to a standstill in the 1974-76 period. Capital per person-hour increased at about 60 per cent of the pace of the 1967-73



period; nevertheless, it was still up sharply compared with that in the 1958-66 period. In the construction, mining, and forestry industries, growth of intermediate inputs, such as raw and processed materials and components, and energy fell by about the same amount as output per person-hour. In agriculture, transportation, finance, insurance and real estate, and trade and utilities the growth of intermediate inputs per person-hour slowed much more than output per person-hour.

For the 1974-76 period, productivity growth was slower in nineteen of the twenty-two manufacturing industries studied (Table 5-2). The drop from the previous period was particularly marked in iron and steel, motor vehicles, motor vehicle parts and accessories, textiles, paper and allied products, petroleum and coal products, and chemicals and chemical products. Only three industries – wood, tobacco and leather – were doing well. Growth of materials per person-hour also declined in all industries, except in the three mentioned. The rate of growth of capital per person-hour rose in only nine of the twenty-two industries, and the rate of growth of energy per person-hour fell in every industry except rubber and plastics. It is significant that the growth of energy per person-hour was slower even in those industries where output per person-hour was growing faster. In eight of the remaining industries, the rate of growth of energy per person-hour fell substantially more than did the rate of growth of output per person-hour.

Table 5-1
Average Annual Percentage Change in Output and Inputs per Person-Hour, Non-Manufacturing Industries, 1958-1976

	Output per person-hour			Capital per person-hour			Intermediate inputs ¹ per person-hour		
	1958-1966	1967-1973	1974-1976	1958-1966	1967-1973	1974-1976	1958-1966	1967-1973	1974-1976
	(Per cent)								
Primary industries									
Agriculture	9.3	4.3	-0.5	7.0	5.4	2.4	9.8	5.6	-1.1
Forestry	9.1	8.6	-4.2	8.1	4.5	4.2	9.1	9.4	-4.2
Mining	6.6	8.2	-5.6	8.6	8.1	2.2	6.6	8.6	-4.8
Service industries									
Transportation and communication	4.7	4.1	2.9	3.8	1.7	2.8	4.5	3.6	1.7
Finance, insurance and real estate	-0.2	2.9	1.0	8.6	4.4	5.4	-0.2	3.9	1.3
Service	1.3	2.3	0.4	3.6	5.3	8.1	-	-	-
Trade	3.1	4.2	1.4	1.6	0.7	0.4	3.2	5.5	1.8
Utilities	7.1	8.7	2.6	4.9	3.3	2.9	7.4	..	2.5
Public administration	..	..	..	..	..	..	..	..	..
Construction	1.7	2.6	0.1	-0.4	3.6	2.1	1.7	2.6	0.1

1 These are inputs other than labour directly employed, and capital owned by a firm. They include energy, raw materials, manufactured goods, and capital and labour services purchased by a firm from any other.

SOURCE S. P. Rao, "An Econometric Analysis of Labour Productivity in Canadian Industries: Some Further Results," Economic Council of Canada, Discussion Paper No. 134 (October 1979), updated by the author.

Table 5-2
Average Annual Percentage Change in Output and Inputs per Person-Hour, Manufacturing Industries, 1958-1976

	Output per person-hour			Capital per person-hour			Materials ¹ per person-hour			Energy per person-hour		
	1958-1966	1967-1973	1974-1976	1958-1966	1967-1973	1974-1976	1958-1966	1967-1973	1974-1976	1958-1966	1967-1973	1974-1976
	(Per cent)											
Total manufacturing	3.48	4.26	1.35	1.79	3.19	4.42	3.59	4.50	1.59	4.28	3.61	1.08
Total durables	3.79	4.58	1.81	1.56	2.78	4.33	3.96	5.02	2.24	4.28	3.91	-0.91
Wood	2.41	2.09	3.03	0.88	5.90	6.98	2.37	1.97	3.28	7.97	5.31	-1.50
Furniture and fixtures	2.63	3.03	0.42	-0.15	2.69	5.90	2.66	3.62	3.58	2.56	2.43	0.35
Iron and steel	4.22	3.02	-1.62	3.87	1.08	6.45	4.17	3.23	-1.44	5.31	5.14	-4.73
Non-ferrous metal	4.77	2.25	-0.98	1.68	4.13	3.53	4.72	2.34	-0.99	6.05	3.22	0.53
Metal fabricating	2.86	1.96	1.37	-0.08	2.98	2.74	2.96	1.42	1.05	4.24	1.95	-0.02
Machinery (except electrical machinery)	4.32	4.23	3.70	1.34	3.08	5.94	4.77	4.18	3.88	4.64	4.91	1.33
Non-auto transportation equipment	3.43	2.78	0.32	4.29	4.08	6.76	4.86	3.03	0.61	0.97	7.41	2.11
Motor vehicle (except parts and accessories)	3.81	9.17	3.96	-0.52	-2.15	1.55	3.79	8.99	4.23	1.91	3.38	-0.24
Motor vehicle parts and accessories	4.28	6.67	-1.43	5.59	2.38	1.22	4.54	6.86	-1.94	7.67	4.98	-2.57
Electrical products	5.19	4.09	0.18	0.84	4.09	3.16	4.93	4.30	0.03	3.65	3.22	-0.02
Nonmetallic mineral products	2.14	2.96	0.68	0.75	2.80	3.32	1.93	2.27	0.34	2.54	3.53	1.86
Total non-durables	3.23	3.97	0.89	2.05	3.59	4.35	3.29	4.09	0.96	4.39	3.50	2.56
Food and beverages	2.41	2.85	1.60	2.19	3.51	1.32	2.38	2.95	1.92	4.01	1.58	-0.55
Tobacco products	5.03	3.44	5.20	5.55	2.77	2.25	4.67	3.31	6.04	10.78	4.60	1.32
Rubber and plastics	7.20	5.79	2.91	1.88	5.20	4.00	7.48	6.69	3.05	2.90	1.74	4.01
Leather	1.70	2.05	4.29	-0.13	4.17	2.71	1.62	2.33	4.63	2.76	3.16	-0.07
Textiles	5.92	7.58	2.79	1.25	1.09	7.35	6.54	8.44	2.71	4.32	4.58	4.50
Knitting and clothing	3.02	4.75	2.44	-1.40	3.28	1.05	3.60	5.35	2.68	2.61	4.95	-2.08
Paper and allied industries	3.35	3.58	-2.68	2.68	3.24	-0.53	3.60	3.81	-2.88	3.36	4.16	1.75
Printing, publishing, and allied industries	1.59	3.32	1.00	1.84	1.92	0.85	1.93	3.30	1.00	3.90	2.34	-4.60
Petroleum and coal products	6.13	5.48	-3.11	1.97	6.72	3.32	6.24	5.34	-3.05	5.24	6.60	-6.83
Chemicals and chemical products	5.08	5.62	-1.94	3.42	3.74	10.48	4.75	5.63	-2.41	8.28	4.49	4.17
Miscellaneous manufacturing	0.96	2.96	2.64	1.55	1.84	-0.55	1.13	3.13	2.77	6.22	-0.50	-4.35

¹ These are all intermediate inputs (defined in the footnote to Table 5-1) other than energy.
SOURCE Same as for Table 5-1.

Influences on Productivity Performance

Keeping in mind this picture of productivity changes, we can begin to look more closely at some of the elements that may have influenced Canada's recent productivity performance, and to speculate on what role these factors may play in the future. Many of our conclusions, and some of them are only tentative at this stage, spring from an econometric analysis of labour productivity. We tried to explain the rate of growth in output per person-hour in terms of the rate of growth of capital, energy, and materials per person-hour and the rate of total factor productivity growth. Total factor productivity growth was examined further in terms of its sources: capacity utilization, economies of scale of operation, labour force composition, and technical change. The detailed results of this analysis are shown in the tables of Appendix C.

STRUCTURAL SHIFT

One theory is that as industrialization proceeds, labour and output shift from low productivity to higher productivity industries. Initially, this will result in a considerable improvement in average labour productivity. But once the move has taken place, this source of growth in productivity will tend to reach a limit. Our analysis indicates that about one-third of a percentage point in the recent productivity slowdown can be accounted for in this way (Table 5-3). There is probably not much choice but to accept that this much of the productivity slowdown is permanent.

Table 5-3

Contribution of Inter-Industry Shifts to Growth in Output per Person-Hour, 1958-1976

	1958-1966	1967-1973	1974-1976
	(Percentage points)		
Total shift effect	0.4	-0.2	-0.5
Employment	0.4	-0.2	-0.6
Output	--	--	0.1
	(Percentage change)		
Output per person-hour	3.4	3.6	0.3

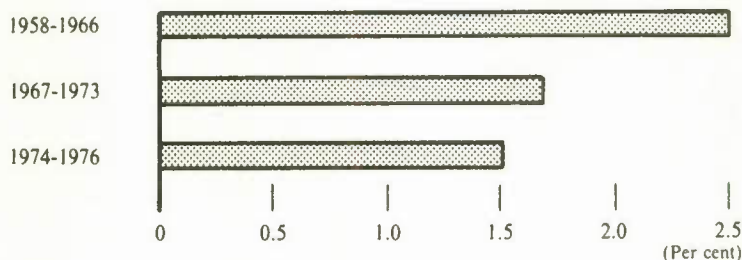
SOURCE Same as for Table 5-1.

THE COMPOSITION AND SKILLS OF THE LABOUR FORCE

Our work indicates that changes in the composition of the labour force did not contribute significantly to the recent slowdown in productivity growth. Although, as we have pointed out, some people have blamed the slowdown on the increased percentage of less-experienced workers in the labour force, the rate of growth of this labour force segment was actually declining in the 1974-76 period (Chart 5-3).

Chart 5-3

Average Annual Percentage Change in the Share of Women and of Men Aged 14 to 19 in the Labour Force, 1958-1976



SOURCE Based on data from Statistics Canada.

In all likelihood, prime-age workers will form a growing proportion of the total work force throughout the coming decade, and the proportion of younger workers will decline (Table 5-4). And by 1990, 32 per cent of the labour force will be women over twenty-four years, compared to about 26 per cent now, and more of them will have had longer work experience. It is possible, then, that the combination of age, sex, and experience of workers in the labour force may make a slight positive contribution to productivity growth in the next decade. But the effect may be offset to some extent if the average education of new work force entrants tends to stabilize at current levels.

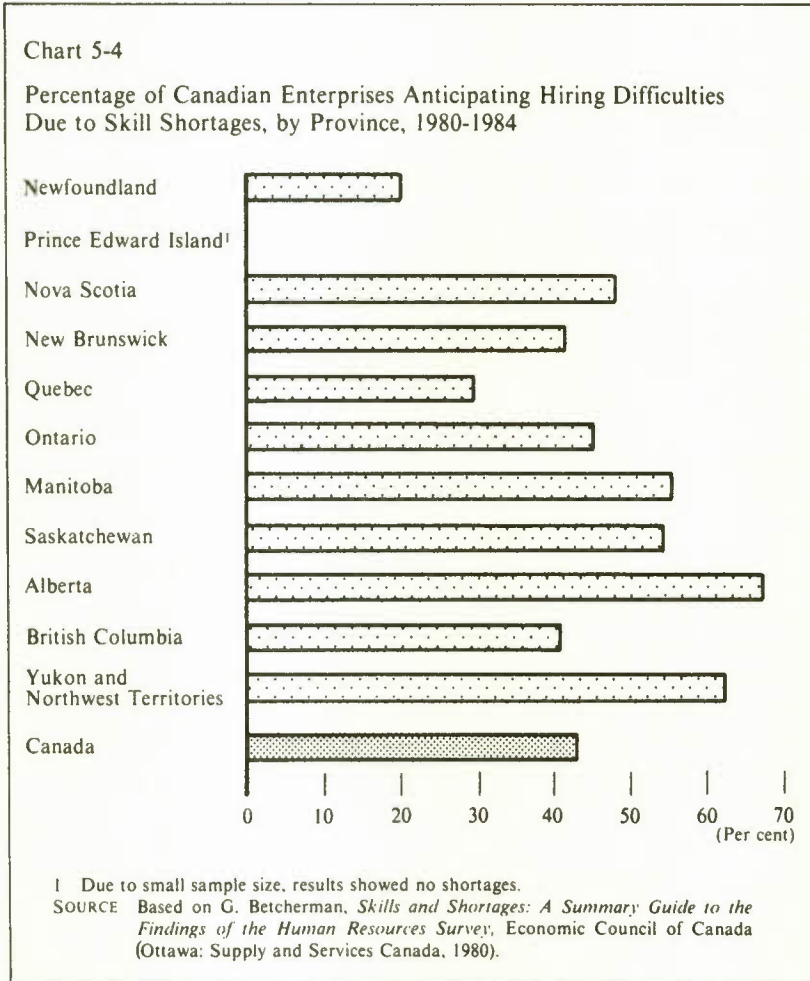
Table 5-4

Labour Force Composition Projection by Age and Sex, Selected Years, 1980-1990

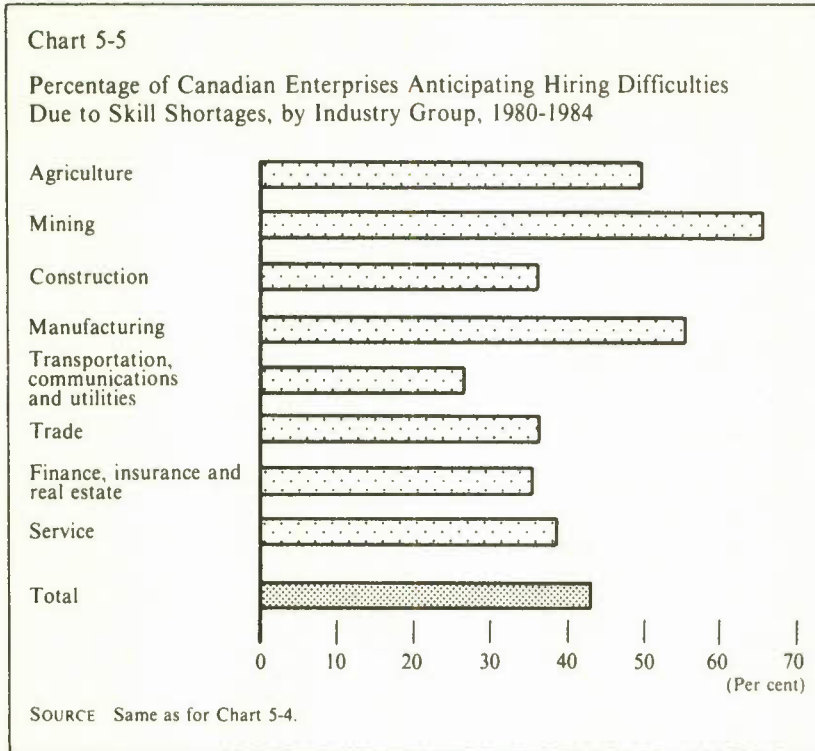
Sex and age	1980	1985	1990
(Per cent)			
Men			
15-19	6.8	5.2	5.2
20-24	8.6	8.0	6.1
25-54	38.8	39.7	40.8
55 and over	7.6	7.3	6.8
Sub-total	61.8	60.2	58.9
Women			
15-24	12.4	10.6	9.3
25-44	17.1	20.2	22.2
45 and over	8.7	9.0	9.6
Sub-total	38.2	39.8	41.1
Total labour force	100.0	100.0	100.0

SOURCE Economic Council of Canada, CANDIDE Model 2.0.

In the long run, the matching of workers with jobs will be an important determinant of aggregate productivity growth. The Council's 1980 Human Resources Survey showed that firms have experienced shortages of skilled workers recently, and that many of them expect the shortages to continue for at least the next five years (Charts 5-4 and 5-5 and Table 5-5).



Such bottlenecks, which raise costs and reduce productivity growth, tend to be eliminated over the long run. But indications are that unless there is a significant increase in skill-training, or unless selective immigration procedures are instituted, skilled-worker shortages may exert increasing pressure. Most of the highly skilled workers are over forty and most of them acquired their qualifications in other countries.



Barriers to labour mobility, such as discriminatory application of licensing regulations, provincial efforts to exclude nonresidents from local employment, and age-sex discrimination by firms, all contribute to reducing productivity, however we choose to measure it. Effective solutions to these problems, along with appropriate training programs, will largely determine how much improvement in productivity can be achieved by labour market policies.

TECHNICAL CHANGE

We could find no clear evidence that a slowdown in the rate at which new technology is developed and adopted might have caused the productivity slowdown. Since we evaluated "technical change" on the basis of the trend over time, no change in its influence on labour productivity for the 1974-76 period could be directly ascertained (Tables C-1 and C-2, Appendix C). Before adopting this particular assumption, we did test the hypothesis that there was a break in this trend after 1973, but we failed to find any supporting evidence. However, this is a very crude way of estimating the effect of technical change.

Table 5-5

Percentage Distribution of Shortages Anticipated by Canadian Enterprises, by Occupational Group, 1980-1984

	Anticipated shortages (Per cent)
Managerial, administrative and related occupations	4.2
Occupations in natural sciences, engineering and mathematics	12.2
Occupations in social sciences and related fields	0.5
Occupations in religion	0.1
Teaching and related occupations	0.9
Occupations in medicine and health	3.3
Artistic, literary, recreational and related occupations	1.1
Clerical and related occupations	6.5
Sales occupations	7.5
Service occupations	7.0
Farming, horticultural and animal husbandry occupations	0.4
Fishing, hunting, trapping and related occupations	-
Forestry and logging occupations	1.2
Mining and quarrying including oil and gas field occupations	1.2
Processing occupations	7.5
Machining and related occupations	13.4
Product fabricating, assembling and repairing occupations	22.3
Construction trades occupations	5.1
Transport equipment operation occupations	2.1
Materials handling and related occupations n.e.c.	1.1
Other crafts and equipment operating occupations	2.4
Total	100.0

SOURCE Based on G. Betcherman, *Skills and Shortages: A Summary Guide to the Findings of the Human Resources Survey*, Economic Council of Canada (Ottawa: Supply and Services Canada, 1980).

After all the other factors, such as labour force composition, plant scale, capacity utilization, capital, and intermediate inputs were allowed for, we were left with a residual of productivity improvement that was not accounted for. There may be some elements of technical change in some of these variables and in the residual.

So appearances may be deceptive. A slowdown in technical progress might be expected to cause a decline in the rate of growth of both intermediate inputs and capital per person-hour. But both these variables are already included in the econometric analysis, and it is almost impossible to separate the various elements and to identify the precise role of technical change.

We would like to have included some other variables, such as research and development expenditures, that would influence technical change. But it would be extremely difficult to do this, since most of Canada's technology is drawn from a world pool of knowledge and very little of it can be attributed entirely to Canadian research and development

spending. For what it is worth, evidence suggests that only a small part of the U.S. productivity growth rate slowdown can be accounted for by a drop-off in research and development spending.

Over the last four years considerable effort has been expended in an attempt to understand the process whereby technical change occurs. Three stages are involved. The first is the invention itself, which may be the product of many years of research. The second is the innovation process, when the invention is developed and launched. The third stage involves the diffusion of innovation. The last two stages probably have the most bearing on productivity growth, because they provide the economy with the most up-to-date and efficient methods of operation.

The Council is currently involved in research on innovation and diffusion. While it may be hard to pinpoint how a new idea is generated, whether it is a cost-reducing method or a new product, we now have a much better understanding about the diffusion of these new discoveries. Knowledge spreads from firm to firm within an industry, from the United States and other countries to Canada, and from region to region within Canada. Canada has lagged behind the United States in adopting, for example, numerical control machine tools and in the adoption of special presses in paper-making.

We are attempting to improve our understanding of the incentives and forces driving this diffusion process to the stage where we can suggest practical and cost-effective measures to speed it up. When such measures are implemented there will be a one-time upward shift in the productivity growth rate during the period when time lags in the diffusion of innovation are reduced. Indeed, in its study of Newfoundland the Council has already suggested that measures of this kind are already feasible for that province.

While Canada only contributes a small proportion of the total of new discoveries, there is no reason to expect a significant fall in the availability of such discoveries for adoption. Inventions evolve through worldwide research and development. In the United States, spending on research and development, as a proportion of gross national product, has tended to decline for some years now. But the effect on the flow of new discoveries does not seem serious so far, and the United States is not the only source of ideas. It seems likely then, that technical change will continue to play an important role in the expansion of real income in Canada during the next few years. In fact, it may even increase in importance.

THE ACCUMULATION OF CAPITAL

The data from individual industries on rate of growth of capital per person-hour show that declines in some industries have been matched by

increases in others and that over the economy as a whole, very little change has occurred. On the face of it, then, the evidence does not support the suggestion that even part of the productivity growth slowdown can be blamed on a slowing of the rate at which new plants are built or old ones are expanded and the rate at which new machinery and equipment is acquired.

Although slower capital accumulation accounts for a good part of the slowdown in productivity growth in primary industries and in construction, it was not a cause of productivity slowdown in manufacturing and service industries, which account for the greater part of the gross national product.

Although we have substantially exonerated capital, the Department of Finance has argued that, indirectly, capital is a cause of the slowdown.² The argument, which is based on historical evidence, holds that the rate of growth of capital per person has normally been higher in recessions than at other times. Because 1974-76 was a recessionary period, we might have expected that capital growth would have counteracted the productivity slowdown in all sectors of the economy. That it did not do so makes it in effect a contributor to the slowdown. The evidence cited in support of this argument by the Department of Finance was persuasive, though not compelling.

We have found that the estimate of investment in the post-1974 period, provided on the basis of historical relationships by the CANDIDE Model 2.0, was significantly higher than the investment that actually took place. In effect, then, capital growth, because it was lower than expected, may have contributed to the productivity slowdown. However, a more comprehensive analysis of the problem is necessary before we can reach a firm conclusion.

CAPACITY UTILIZATION

Over the long run, the degree to which industries use their productive capacity will not change much. But in shorter time periods, capacity utilization will vary with the swings in economic activity that characterize the business cycle. Since capacity utilization is a manifestation of the business cycle, we have concluded that the impact of the business cycle on productivity growth was of considerable importance in the 1974-76 period.

The data in Table 5-6 show that the capacity utilization rate declined sharply in 1974-76 in agriculture, construction, forestry, and manufacturing. Since the rate declined in the economy as a whole, it was assumed that it also fell in the communications and transportation and in the

finance, insurance, and real estate sectors. A more detailed analysis will be found in the tables in Appendix C.

Table 5-6

Average Annual Percentage Change in Capacity Utilization, Selected Industries, 1957-1976

	1957-1966	1967-1973	1974-1976
	(Per cent)		
Agriculture	1.2	-1.0	-1.5
Construction	0.7	-1.0	-1.3
Forestry	1.2	0.6	-14.4
Manufacturing	1.2	0.1	-5.8
Industrial composite	1.2	0.1	-10.5

SOURCE Same as for Table 5-1.

ECONOMIES OF SCALE

Economies of scale are so complicated to analyze that it is hard to estimate their effect. They include not only plant economies, but also product economies, multiplant economies, economies of scale in research and development and marketing, and economies of market size. Our present methodology was limited to examination of plant economies only, although some of the Council's earlier work found that in Canada product economies may be even more important influences on productivity performance.

Our current work did not reveal that plant economies in the manufacturing industries played a significant role in the productivity slowdown. But in the primary industries and construction, this influence was important. It is worth noting, however, that studies based on financial accounting data rather than on physical production data have rarely revealed plant specific scale economies and thus our work may underestimate their influence on productivity.

As output growth resumes in the future, this feature of underutilized capacity in the recent past will disappear. It will be possible, however, to take advantage of even more opportunities to exploit economies of scale by expanding markets for some industries. The classic example of this kind of policy is the automotive agreement. When this agreement came into effect, auto makers in Canada began manufacturing specific models for the whole of North America rather than just for the limited Canadian market. The result was a very large increase in the efficiency with which production resources in the automotive industry were used and a rise in both labour productivity and in total factor productivity.³ Appropriate policies could lead to further productivity improvements of this kind.

Taking advantage of scale economies does, however, involve adjustment problems. If some industries expand to a size needed for world-scale operations, others may have to contract. Retraining and possibly relocation of workers will be necessary, as the Council pointed out in its 1975 report *Looking Outward*.

MATERIALS AND ENERGY

What role did growth in materials and energy inputs play in the productivity slowdown? Because world prices of materials and energy were rising in the 1974 to 1976 period, industry may have curtailed their use. Since workers would then have less materials and less energy to work with, labour productivity would have declined. On the face of it, it is hard to tell what role these inputs played in the productivity slowdown, because when output per person-hour – or labour productivity – declines, we would expect to see a reduction in materials and energy inputs per person-hour too. The evidence is not conclusive enough to pin principal responsibility for the productivity slowdown on changes in the price of energy and materials.

Our analysis indicates that in thirteen out of twenty-two industries, the growth rate of energy used per person-hour slowed more significantly than the growth of output per person-hour. That this was so probably means that energy prices were partly to blame for the productivity slowdown. But their contribution to the slowdown appears to be quite small. More details will be found in the tables in Appendix C.

Our incomplete knowledge about the full – direct and indirect – effects of costlier energy on production efficiency in energy-using industries gives rise to some concern. If these effects are more serious than we can detect so far from present evidence, productivity growth could suffer if energy prices continue to rise. But our analysis strongly suggests that increased energy prices in the 1974-76 period had very little direct impact on productivity performance.⁴

One possible explanation for the productivity slowdown is the indirect effect on capital accumulation that high prices for materials and energy may have.⁵ If that effect has now worked itself out, and if there are no more significant increases in the real price of energy and materials, productivity might be expected to improve on its own. The question whether this will happen is important, for costly and difficult policies to improve productivity growth at the industry and firm level might then become unnecessary.

HOW ENERGY AND MATERIALS PRICES RELATE TO CAPITAL ACCUMULATION AND GROWTH

Capital accumulation and energy prices are connected. If energy prices go up, industry may decide to reduce its machinery and equipment because it becomes too costly to operate. If this is so, energy and capital are said to be complements. When the amount of capital in place per employed person is gradually reduced, labour productivity goes down, and the decline is permanent. The result is that when less energy and less capital are substituted for human muscle power, labour productivity is reduced.

Making a permanent adjustment to these changes could take a considerable number of years. Much equipment now in place has no alternative use, and it may pay to continue operating it until it wears out, even though higher fuel and energy prices have meant higher running costs. Eventually, though, the equipment will have to be replaced. Until this point is reached, the downward adjustment of capital and a downward pressure on productivity growth rates will persist.

Some economists have argued that capital and energy are substitutes, not complements. For example, if energy prices increase, a business could save fuel by installing a more capital-intensive, fuel-burning system. Use of hydro and atomic plants may be increased to save fuel in the generation of electricity. Both of them are more capital-intensive than oil- or coal-fuelled plants.

If capital and energy are substitutes rather than complements, the ultimate effect of rising energy prices is that capital accumulation increases rather than decreases and that the extra capital in place partially offsets the loss in labour productivity from reduced energy use. The easier it is to substitute capital for the more expensive energy, the greater the offset can be, though it can never be total. Some part of the productivity decline will be permanent.

Precise measures of the degree of substitutability and complementarity between energy and capital would assist greatly in assessing the ultimate impact of energy price increases on labour productivity, and hence on living standards. Because we do not yet have reliable enough measures, and because we know that adjusting the amount of capital in response to energy prices takes a great deal of time, we cannot yet know whether the full effects of energy prices on productivity have worked themselves out. The problem is exacerbated by the fact that the statistical data needed to make the decision follow the events they record with a lag that is sometimes several years long.

Research is nevertheless proceeding, at the Economic Council and elsewhere in Canada and the United States, on this critical question of

whether capital and energy are complements or substitutes, and if so to what degree, industry by industry. Once this research is complete, it will be possible to work out the temporary and more permanent implications for labour productivity. Then it will be possible to make judgments on whether the energy price rise has played a major or a minor role in the productivity problem of the last few years, on whether the effects are over or close to it, and on whether the productivity effects will be minor or major if future energy price increases exceed the general rate of inflation.

But the research must do more than look at the relationship between the use of capital and energy and their prices. Interrelationships among all factors – capital, energy, labour, and materials – are important. The effects of a rise in materials prices generally, as well as of energy prices, also need to be worked out.

SOME OTHER POSSIBILITIES

The remaining ideas on why the slowdown occurred can be dealt with rapidly, since the available evidence is scanty. It has been claimed that the increase in regulation and controls has been a major contributing cause of the productivity slowdown; yet those industries in which regulations and controls have increased most sharply have experienced no greater, or less, of a productivity slowdown on average. There is also an opinion that the overall slowdown is attributable to a few problem industries; but, when weighted for proportions of employment and output, no small set of industries dominates the downward influence. These two comments reflect the across-the-board nature of the productivity slowdown.

Another view – that productivity gains are increasingly being reflected in higher quality – cannot be rejected, though why this should have happened so suddenly after 1973-74, and with such remarkable uniformity across industries, is not so easy to understand. Some plausible suggestions have been made. For example, a dominant engine of technical change in the last decade has been the computer, but its contribution to productivity growth is not easily measurable.

Conclusions

We conclude that over a quarter of the economy-wide productivity slowdown was due to cyclically weak demand. Cyclical factors, capital accumulation, and changing labour force composition, and identifiable technical change together account for 33 per cent of the slowdown. Perhaps another 9 per cent is attributable to structural shifts, making 42 per cent of the slowdown explicable by the factors so far considered. While we cannot be precise about the contribution to the slowdown

directly due to the energy crisis and to the run-up in world materials' prices generally, these effects coupled with those noted above probably explain only about one-half of the slowdown. The indirect effects of international commodity prices, the unmeasured impact of slower technical change, capital accumulation, and pace of specialization and perhaps a host of other minor factors may be responsible for the unexplained half of the productivity slowdown. In Chapter 6 we examine the regional dimension of productivity growth to see what light this may throw on the slowdown.

6 The Regional Picture

If the productivity slowdown is not common to all regions of Canada, it may be possible to improve national productivity performance by closing some of the regional gaps in productivity growth. For policy purposes, then, it will be important to have some understanding of how the productivity of various regions has been changing. A regional analysis of productivity might also be useful in confirming or disproving the explanations developed in the previous chapter for a slowing of national productivity growth. And, indeed, our study of regional productivity performance supports our tentative conclusion that, apart from the business cycle, no other single explanation for the productivity slowdown can at this time be proven to be of major significance.

The Council's recent analysis of productivity at the regional level focused on two particular areas that are especially important in understanding national productivity and for developing policies to improve it. The first is the productivity of the service sector; and the second is the way in which new technology spreads and is gradually adopted by firms in different regions. From these particular cases, certain conclusions can be drawn about policies to improve productivity growth in Canada. In our opinion, such policies are both feasible and socially urgent.

The Pattern of Productivity Slowdown

An analysis of productivity growth on a regional basis indicates that Ontario, British Columbia, the Atlantic region, and Manitoba all experienced slowdowns roughly comparable to each other and to that at the national level. The evidence on Saskatchewan is not as clearcut, so that it is hard to establish whether the rate of productivity growth slowed there. So far, on the basis of very tentative evidence, Quebec and Alberta appear to have escaped the slowdown. If this proves true for Quebec, and if the slowdown persists elsewhere, it would imply that there will be less of a disparity between that province and Ontario in the future.

At the outset, we should mention that a technical difficulty was encountered in the analysis that could affect the results. Although the

study used data on gross provincial product – that is, the total provincial output of goods and services – no official estimate of a price index or “deflator” exists for these data. Adjusting the provincial output figures for inflation by using a national price index may not give an accurate reading, because prices can increase by different percentages in different regions. This method is particularly unsatisfactory for provinces like Alberta and Saskatchewan, where a high proportion of provincial output consists of primary products whose prices vary widely and often.

Despite this problem, we decided it was necessary to adjust the provincial data for inflation so we chose to use the national price indexes (the GNE implicit price deflator) and have made some cautious adjustments to our commentary to allow for this. We avoided drawing conclusions that could easily be upset if appropriate price indexes were available.

Our calculations are based on the percentage change in output per employed person in four areas of Canada, after adjusting for inflation. Alberta and Saskatchewan were excluded because the recent large changes in prices for energy and materials would make figures for individual years misleading. Data for the Atlantic provinces were combined because percentage change figures for the individual provinces are probably subject to too much measurement error to be useful. For both these reasons Manitoba was also excluded. However, we have some comments on productivity performance in the prairie provinces based on the average of several years’ changes.

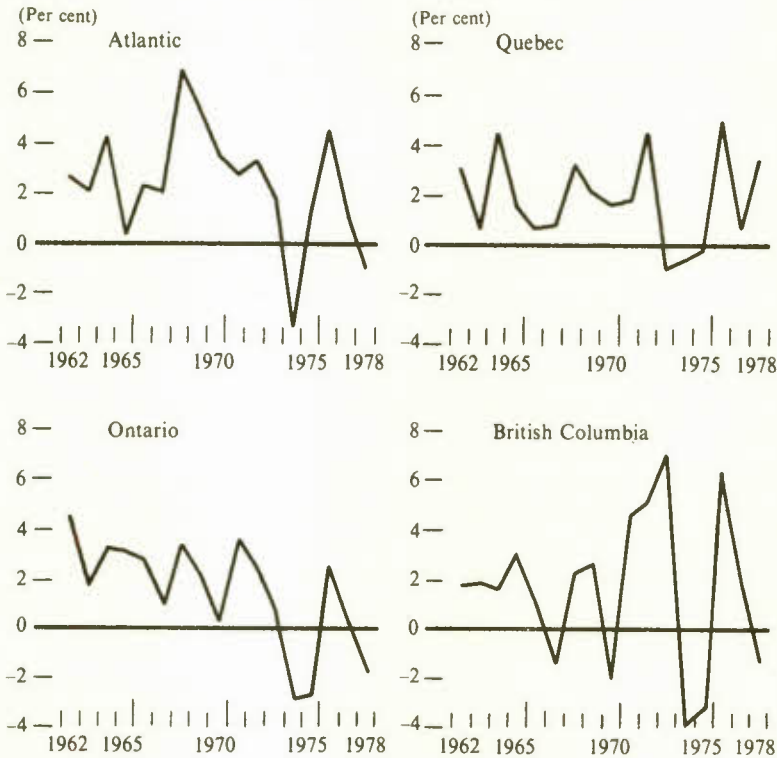
At first glance Chart 6-1 indicates that the four regions experienced good productivity growth to 1972-73 and poorer growth thereafter. But a different picture emerges if we look at average increases before and after 1973-74. It then appears that Ontario, British Columbia, and the Atlantic region had significantly lower productivity growth after 1973, but Quebec did not.

In Ontario, six years out of twelve between 1962 and 1973 showed quite significant improvement over the previous year; that is, at least a 2.5 per cent annual rate of increase was achieved in these years. There was no year in which the productivity growth rate declined. However, after 1973, productivity increased significantly in only one year; for three years out of the five, it actually declined. There was, in fact, a large drop from the rate of growth experienced in the twelve years up to 1974.

The Atlantic region data tell a quite similar story. In the twelve years before 1974, seven years showed quite healthy increases of a more than 2.5 per cent annual growth rate, and there was no year in which the rate declined. In the five years from 1974 to 1978, the growth rate declined in two years and averaged considerably lower than the earlier period.

Chart 6-1

Annual Percentage Change in Gross Regional Product per Employed Person in Four Regions, 1962-1978



SOURCE Based on data from Statistics Canada.

Although the economy of British Columbia has a large natural resources component for which markets are very volatile, there is enough industrial activity of other types to make study of output per person worthwhile. We found that there was a significant change in performance just as in Ontario and the Atlantic region. There were five years of good growth in the period up to 1974 and only two years in which the rate of productivity growth declined. In the five years after 1973, the rate of growth declined in three years and only increased significantly in one.

The change in Quebec's productivity performance was not nearly as marked as it was in the other three regions, though this may be partly because Quebec did not do very well in the earlier years up to 1974. Before 1974 there were four years of healthy growth, three of quite low growth, and one year in which productivity declined. In the years after 1973, there were two years of good growth and two years in which

productivity declined but, on average, Quebec's productivity growth rate was almost unchanged from the previous period. But before making too much of Quebec's apparent escape, it will be necessary to probe a little deeper.

First, the results may be influenced by the fact that we chose 1974 as the start of the low productivity growth period. If we had chosen 1973 instead, there would have been a much larger slowing in the rate of productivity growth in Quebec. But even so, the slowdown is still considerably less than in Ontario, the Atlantic region, or British Columbia. Second, the conclusion might reflect the fact that using a national price index to adjust provincial output figures makes more of a difference for Quebec than it does elsewhere. It could be that prices in Quebec have risen substantially more than average. There is no solid evidence on this but city price indexes show that inflation has been about the same in Montreal as in Toronto and other Canadian cities. Third, the provincial accounts data on which these calculations are based are preliminary. Later revisions could reveal that Quebec did not really escape the productivity drop at all.

Finally, it should be noted, too, that Quebec's dependence on interprovincial trade is greater and on foreign trade somewhat lower, than many of the other provinces and certainly Ontario.¹ Thus it is at least possible that economic activity in the province was not affected as soon or as heavily as other areas of the country by the adverse international economic environment of recent years.

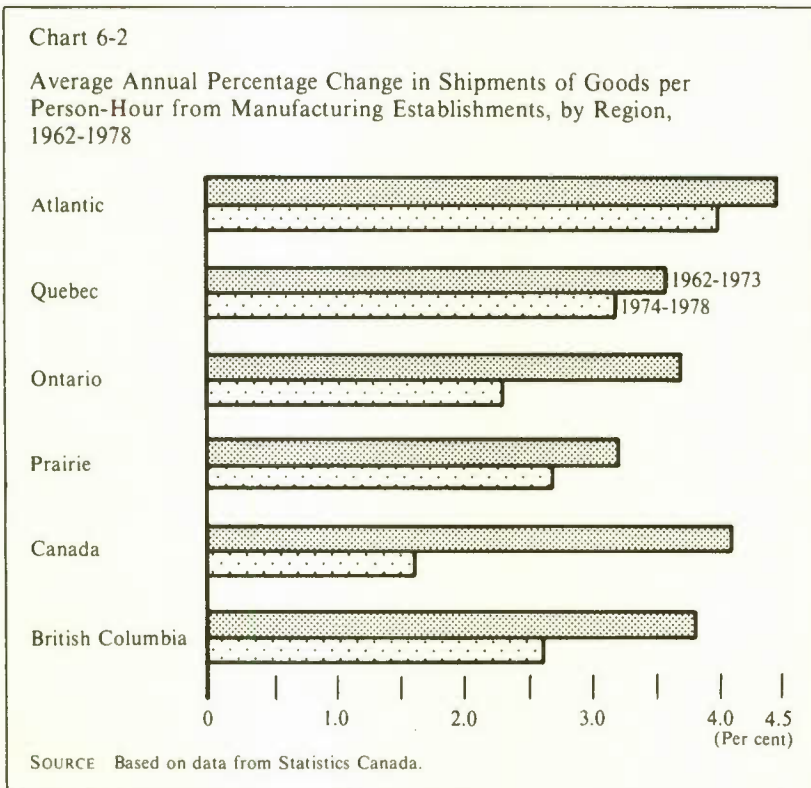
All things considered, the most we can do at this stage is draw a provisional conclusion that Quebec has been exempted from the slowdown. If the exemption proves long lasting, the implications will be profound. The disparities in income between Quebec and Ontario that have existed for the past hundred years could conceivably close in a decade.

Some tentative conclusions are possible about the productivity performance of the prairie provinces, although as already mentioned there are problems in interpreting the data. In both Alberta and Saskatchewan very large increases were registered in output per person in 1973 and 1974; after allowing for inflation, the rise averaged over 10 per cent annually. Sharp increases in the prices of materials and energy during this period undoubtedly were largely responsible. And these price increases would not be adequately reflected in the national price index that was used to adjust the provincial output figures for inflation. Even so, in the case of Saskatchewan it is not possible to draw any firm conclusion. In the past, this province has experienced wide swings in productivity growth because of the dominance of agriculture in which productivity varies greatly with year-to-year weather conditions. Therefore, it is impossible to say now whether the high growth of output per person employed in the 1973-74 period represents a break in past trends.

Productivity growth has been much steadier in the past in Alberta than in Saskatchewan. Even if we leave out 1974, on the grounds that increases in energy and materials prices prevent accurate productivity measurements, it is hard to detect any evidence of a later productivity slowdown. From 1975 to 1978, the growth rate averaged 2 per cent compared with 3 per cent in the earlier period. Manitoba data suggest that this province has suffered from the same decline in the productivity growth rate as Ontario, British Columbia, and the Atlantic region. It seems, then, that only Alberta and Quebec managed to escape the productivity slowdown.

It would be useful if we could confirm these tentative conclusions by looking at individual industries. At the national level, the productivity slowdown was spread fairly evenly across all industries. Unfortunately, industry data on a regional basis are only available for manufacturing, which accounts for less than one-quarter of the national economy.

In Quebec, however, manufacturing accounts for a relatively higher proportion of economic activity, so we examined productivity growth in this sector to see whether our tentative conclusion about Quebec's productivity performance could be supported. Chart 6-2 indicates that



the drop in the rate of growth in shipments of goods per person-hour between the two comparison periods was substantially smaller in Quebec than in Ontario and British Columbia, and than in Canada as a whole. This was mainly because manufacturing in Quebec held up much better in the 1974-75 recession than it did in the rest of Canada. The manufacturing data suggest, therefore, that Quebec may have escaped the productivity slowdown. But we can only regard this as a suggestion, because the Atlantic region performed exceptionally in 1973-74 with better-than-average results in manufacturing, contrary to what the regional output calculations show. The data on prairie manufacturing also seem to be slightly at variance with the regional output results.

The Reasons for the Productivity Slowdown

The possible reasons for the productivity slowdown discussed in the previous chapter are generally substantiated by the regional data. In fact, these data help to illuminate the discussion.

The discovery that the slowdown in productivity growth is widespread across regions is reasonably consistent with the importance attached to the role of the business cycle, because such cycles are generally Canada-wide. The fact that Alberta escaped the slowdown in the first part of the post-1974 period may be a result of the boom in demand sparked by natural resources exploitation at a time when demand was slackening elsewhere in Canada. It is not as easy to account for Alberta's better productivity performance in more recent years. And it is very hard to account for Quebec's experience. Quebec usually experiences a cyclical decline at least as severe as Ontario's; yet in 1975 its rate of productivity growth declined far less than that in Ontario, and it recovered much better in 1976. Again, this may be because Quebec is more dependent on trade with other regions than on international trade, so that it would be slower to feel the effects of the business cycle.

The regional evidence helps to reduce the uncertainty expressed in the previous chapter about the respective importance of the rise in material and energy prices, a possible slowdown in desired capital accumulation, and a possible fall-off in the rate of technological progress in the productivity slowdown. It might be expected that a fall-off in the rate of technical progress would have the most severe effect in the richest provinces – Ontario and Alberta – and the mildest effect in the poorest – the Atlantic provinces – with moderate effects elsewhere. This is because new technology tends to be adopted in the richest regions first and is slow to spread to the poorest regions. In view of this, the fact that the Atlantic region and British Columbia were about as severely affected by the productivity slowdown as Ontario suggests that a fall-off in technical change cannot be of great significance.

On the surface, Alberta's good productivity growth performance, and the known facts of its resource wealth, might seem to add weight to the hypothesis that price increases in materials and energy may have played an important role in the slowdown in productivity growth. Alberta might well gain substantially from its resources, because the terms of trade may move in its favour, and the stimulus that this extra income would give to demand might be expected to boost productivity growth. Although these factors operated to keep productivity growth high in 1974-76 in Alberta, they were not nearly as important after that, though the preliminary measures of productivity indicate good performance. Alberta's apparent escape from the productivity slowdown in recent years does not tell us much one way or the other about the role of price increases in energy and materials in the productivity slowdown.

The regional data give further support to the conclusion that the rate of productivity growth has not been slower because the service sector has increased in importance or because the quality of output has improved and measured productivity may have missed this. An increase in the demand for services and in the quality of goods and services is usually associated with higher real incomes per person. This would suggest that richer regions should show severer symptoms of productivity decline than poorer ones. But as we have seen, this is not what happened.

We conclude, then, that the regional data corroborate the conclusions we reached in Chapter 5. We turn now to our particular cases to see their implications for policy to improve Canada's productivity performance.

Regional Differences in Productivity in the Service Sector

Our regional research has revealed sharp differences in service sector productivity between provinces and between regions. This seems to support the idea that productivity improvement in the service sector is both possible and desirable. The service sector now comprises close to two-thirds of the whole economy. If productivity in the economy as a whole is to be increased significantly, improvements in the service sector are essential.

There are some, however, who may consider this statement as open to argument. Two main objections may be raised. First, because services are intangible and difficult to measure, there is a feeling that the less we have of them, the better. This reaction seems to come through strongest in discussions of the services provided by governments, such as defence, administrative work in processing government transfer payments like unemployment insurance, family allowances and pensions, enforcement of anti-trust legislation, school and university teaching, and so on. We suspect that the objections in these cases may have more to do with who

is providing the service, rather than with service activities per se. Certainly many other services are accepted as generally worthwhile, for example, dental care, appendectomies, piano lessons, and baseball games. The fact that statisticians treat services on a par with goods in calculating the gross national product must be assumed to reflect both reality and society's choice.

The second objection to the claim that productivity in the service sector can be improved also relates to the problem of measurement. If we cannot tell what productivity is, how can we improve it or how could we measure an improvement even if we thought we had achieved it? Education is a prime example: what is the output of a school teacher? It is obviously not number of pupils, or even number of pupils graduated. And if it is the amount of education imparted, which statistician will be brave enough to try to measure that? Because productivity measurements are usually related to output, and because output of services is so hard to identify, we are then compelled to measure output in terms of inputs. Educational output, for example, could be measured by the number of teachers with each valued at his or her salary plus other costs. If we accept this then, by definition, productivity improvement is impossible.

We are not convinced of the ultimate impossibility of measuring output in these activities, and we think that productivity improvement is possible in the great majority of service sector industries. Casual observation can quickly produce a long list of examples: the replacement of conventional restaurants by fast food outlets; the substitution of computerized cash registers for ordinary ones; the adoption of power tools in garages instead of hand tools; the use of new drugs to shorten or eliminate hospital stays; and the development of containers and jumbo jets that dramatically improve transportation efficiency.

The Economic Council's analysis of interprovincial productivity differences in the service sector concentrated on three areas:

- a comparison of output per worker in different provinces for two important service industries – federal government administration and health care;
- interregional comparisons of the extent to which innovations known to improve productivity – computers, shopping centres, and containers – have been adopted; and
- a comparison of output per worker in Newfoundland and Ontario for individual service industry establishments in retail trade, trucking, the provision of insurance, and hotel accommodation.

FEDERAL GOVERNMENT ADMINISTRATION

In federal government administration, output per worker varies widely among provinces. The Income Maintenance Branch of the Department of

Health and Welfare has developed performance indicators for about 85 per cent of its operations, thus allowing it to measure efficiency. The indicators include: the average time required to process applications for benefits; the percentage of cheques returned; processing error rates; average waiting time for a client interview; and average response time for a field visit. This kind of performance measurement helps management to achieve efficiency goals and maintain an adequate level of services.

Analysis of these performance measures shows that, over the four-year period from 1971-72 to 1975-76, the measured workload of the Income Maintenance Branch increased while the number of person-years worked decreased, giving an improvement in efficiency of about 3 per cent a year. Between 1973-74 and 1975-76, for example, the average time needed to process new family allowance applications was reduced from 11.4 to 5.8 days.

Productivity performance varied considerably from province to province. Performance was below the national average in three of the four Atlantic provinces and in Quebec, Manitoba, and Saskatchewan. It was above the national average in Ontario, Alberta, British Columbia, and Nova Scotia (Chart 6-3).

The example shows that productivity performance can be measured with some accuracy in selected areas of the service industries, and that it is possible to make real improvements in productivity in these industries. It also indicates that there are significant variations in the productivity performance of service industries on a provincial basis just as there are in the goods-producing industries.

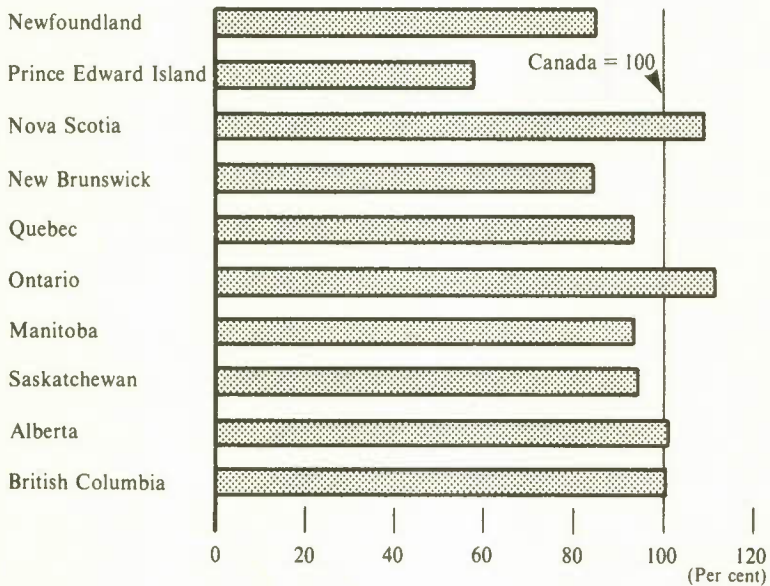
HEALTH CARE

In health services we looked at the productivity of physicians and the results were unexpected because they did not correspond to our earlier findings on productivity in manufacturing industries. For the purposes of analysis, we standardized the output of physicians by taking into account provincial variations in the degree of specialization and in payment for different services. This exercise allowed us to identify provincial variations in real output per physician. The measure of output per physician does not, however, make any allowance for variations in the quality of physicians' services. The methodology is described in Appendix D.

On this basis output per physician ranged from 13 per cent above the Canadian average in Newfoundland to 10 per cent below the average in British Columbia (Appendix D). The figure in other provinces fell somewhere in between with Manitoba, Nova Scotia, and Alberta below average and Quebec well above average. Much of Newfoundland's stronger performance can be shown to come from greater output of

Chart 6-3

Productivity¹ in Provincial Offices of the Income Maintenance Branch,
Health and Welfare Canada, as a Percentage of the National Average,
1972-1973



¹ The productivity index is based on 26 performance indicators for 8 measurable processing and client service operations.

SOURCE Based on data from the Incomes Program Branch, Health and Welfare Canada.

general practitioners and medical specialists. British Columbia's, Alberta's, Manitoba's, and Nova Scotia's weaker performance can be shown to come not only from general practitioners and medical specialists but from surgical specialists and anesthetists as well.

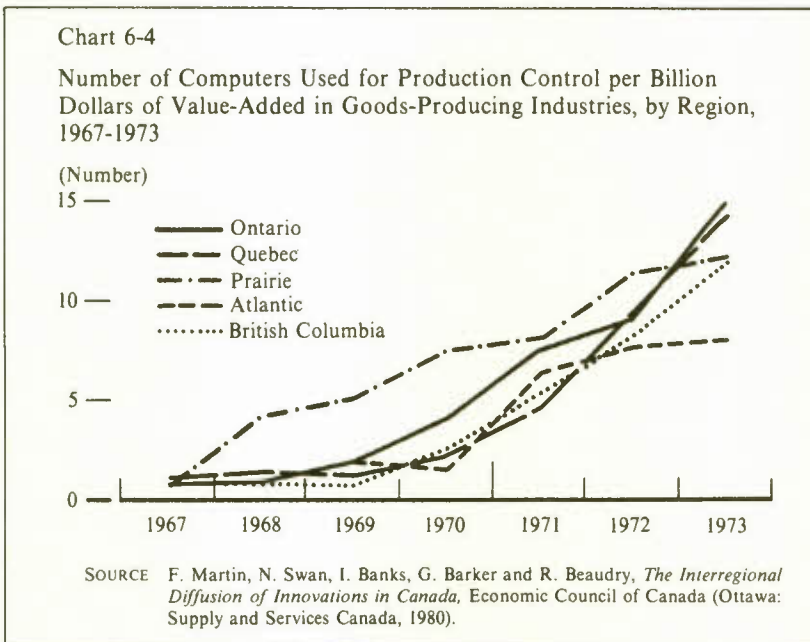
These variations in productivity performance are almost the exact opposite of the provincial variations in productivity for the goods-producing industries. In these industries, productivity performance was found to be consistently above the Canadian average in British Columbia, Alberta and Ontario but below average in Quebec and the Atlantic provinces. The implications of the health care findings are that physicians in some of the high-income provinces have a lower output than their counterparts in some of the low-income provinces.

INNOVATION IN THE SERVICE SECTOR

The spread of particular innovations and the speed with which they are adopted by the service industries can also have an impact on productivity.

Computers, for example, may increase productivity in the service sector by speeding up production planning; shopping centres add to productivity in the delivery of retail trade services; and the use of containers in the transportation of general international cargo may increase productivity too.

For many years, the extent of computer usage has varied in different regions. Some indication of the speed with which computers were adopted is shown in Chart 6-4. Although the prairie region was far ahead in 1970, and Ontario too was well ahead of other regions, only three years later all regions had surpassed the 1970 prairie level of usage.



The development of shopping centres in retail trade is also of interest. Alberta and, again, Ontario were the forerunners in adopting shopping centres in retailing, with development picking up somewhat later in other regions (Chart 6-5).

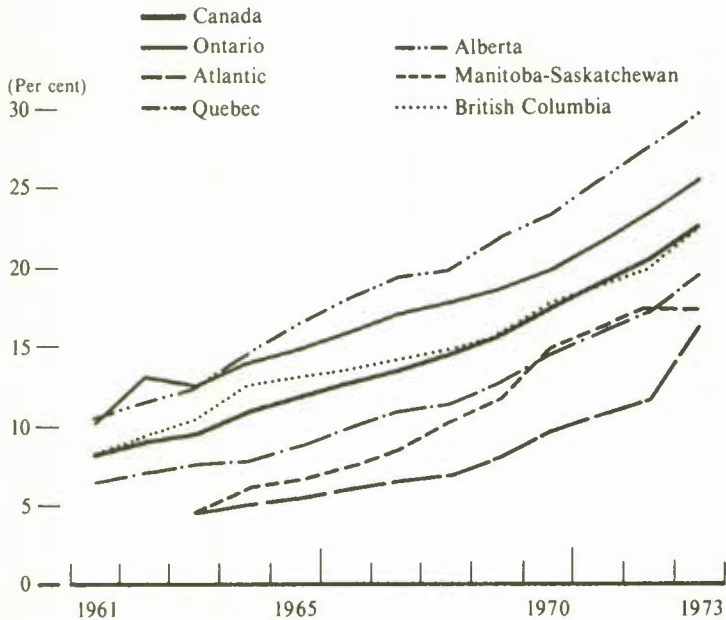
Similarly, the extent to which general international cargo was moving in containers in 1971 varied from a low of 11 per cent in Saint John to a high of 58 per cent in Halifax. Again, most of the ports with a low level of container usage later increased their percentages very considerably (Chart 6-6).

COMPARISONS FOR INDIVIDUAL ESTABLISHMENTS

The Council carried out a special survey of individual establishments in Newfoundland and Ontario in 1979 to determine productivity levels in

Chart 6-5

Sales in Shopping Centres as a Percentage Total Retail Sales,¹
by Region, 1961-1973

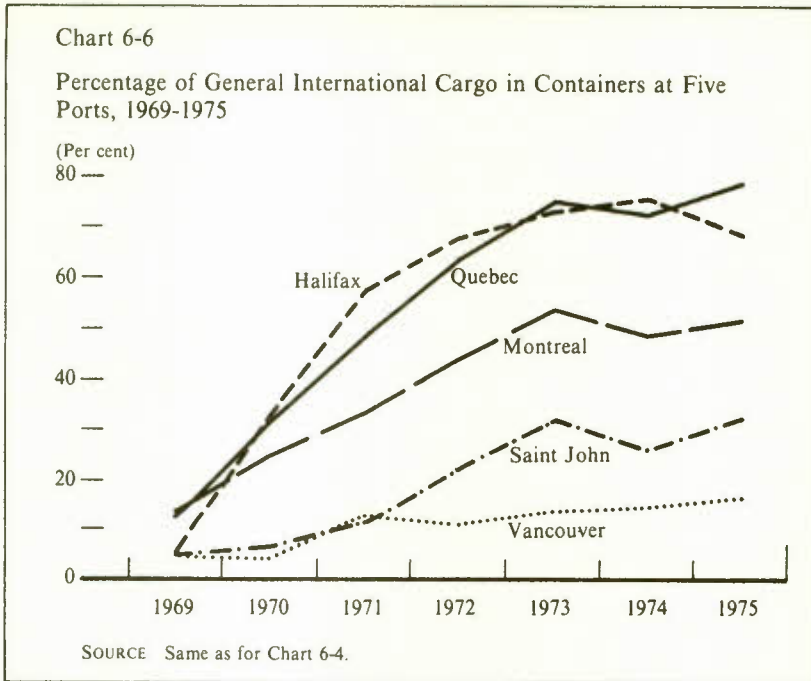


¹ Excluding goods not usually found in shopping centres.
SOURCE Same as for Chart 6-4.

certain service industries (Chart 6-7). Productivity in Newfoundland ranged from just over half of the Ontario level in independent grocery stores to well above the Ontario level in bakeries and corporate grocery chains. Only the productivity of department stores, hotels, voluntary group grocery stores and wholesale confectioners in Newfoundland is as close to the Ontario level as might have been expected for two regions within the same nation. Productivity in trucking, insurance, and nonresidential construction in Newfoundland was less than three-quarters of the Ontario level.

CLOSING REGIONAL GAPS IN PRODUCTIVITY IN THE SERVICE INDUSTRIES

There is considerable scope for improving the level of productivity in Canada simply by closing some of the gaps in productivity between regions. If the provinces with low productivity in their service sectors were only brought up to the present national average, the level of national productivity could rise by between 2 and 3 percentage points. Less



conservative estimates, based on bringing the productivity of all regions up to the levels of Ontario or British Columbia, show that national productivity could be raised by as much as 6 percentage points.

Regional gaps in productivity will not be closed quickly, nor will they ever be completely closed. But the fact that, as recently as 1960, every one of today's high-productivity regions had a lower level of productivity than even the lowest regions now have proves it can be done.

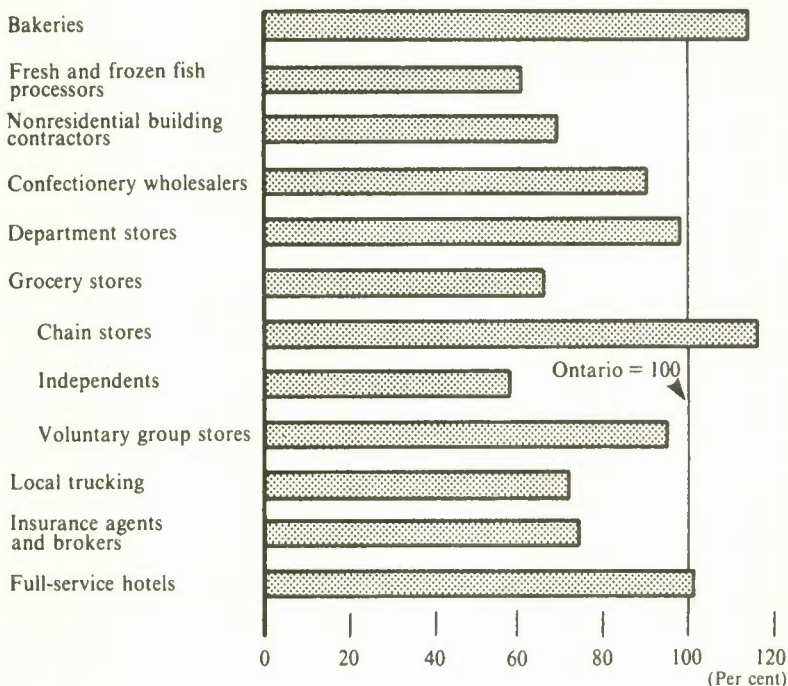
We have already provided examples showing that it is quite feasible for regions with low service sector productivity to improve so that they reach levels achieved in the most efficient regions. Before we discuss what kind of policies might be used to close regional productivity gaps, we look at one more particular case to see whether it can give us a better understanding of regional differences in productivity.

Productivity and the Spread of New Technology

One explanation of why productivity is lower in some regions than others is that new techniques are adopted later in some regions than others. We have already seen how this applies in the service sector. There is evidence that in other industries too, new technology takes longer to reach some regions. If this time lag could be reduced, productivity gaps between regions could be narrowed, and national productivity increased.

Chart 6-7

Value-added per Person-Hour, Newfoundland as a Percentage of Ontario,¹ Selected Industries



¹ Nova Scotia, in the case of fish processors.

NOTE For nonresidential building contractors, full-service hotels, confectionery wholesalers, and local trucking, the data are for 1978; for the other five industries, the data are for 1977.

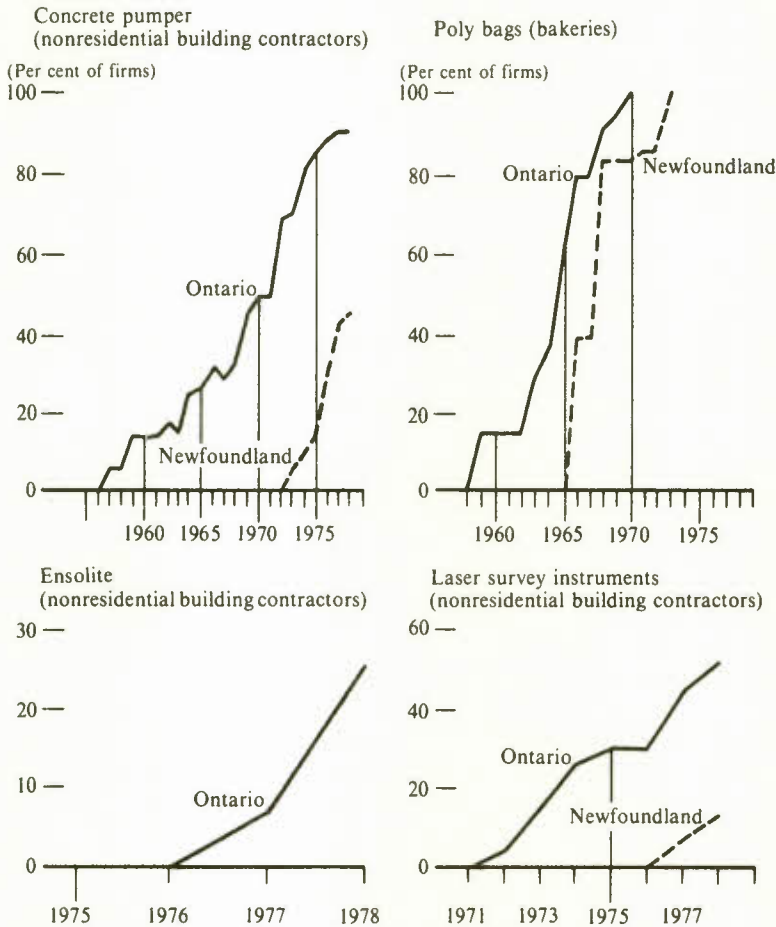
SOURCE *Newfoundland: from Dependency to Self-Reliance*, Economic Council of Canada (Ottawa: Supply and Services Canada, 1980).

Further examples of regional differences in the speed with which new technology is adopted were reported in the Council's recent study of the Newfoundland economy. As part of that work, researchers looked at how quickly several productivity-raising innovations were adopted by firms in Ontario and Newfoundland. The examples cited here are laser technology in surveying, concrete pumpers and ensolite in the construction industry, and polybags in the bakery industry (Chart 6-8).

The use of laser technology in surveying land was first reported in Ontario eight years ago. By 1978 over 50 per cent of the establishments contacted had used this technique that enables one person to do the work of two. In Newfoundland, its first reported use was three years ago and in 1978 only 13 per cent of the establishments surveyed had used it. They

Chart 6-8

The Diffusion of Selected Technologies, Newfoundland and Ontario, 1957-1978



NOTE Diffusion is shown by the changing percentage of firms in the industry using the technology over time.

SOURCE Same as for Chart 6-7.

apparently were slow to adopt this technology, because they were not familiar with the equipment and because they believed that traditional methods were just as good.

In Ontario, concrete pumps were first used in the construction industry about twenty years ago. These specially designed trucks are used to pump a flow of concrete from ready-mix trucks to building forms – a much more efficient method of building above the ground than the traditional re-use of buckets or wheelbarrows. By 1978 over 90 per cent

of the Ontario establishments contacted were using concrete pumpers. But builders in Newfoundland only started to use concrete pumpers in 1973, and by 1978 only 46 per cent of the contractors surveyed had ever used this piece of equipment. The low level of building activity in Newfoundland as well as the fact that it is spread over such a vast area may have made the more widespread use of concrete pumpers uneconomical. But it is also possible that limited access to this equipment has hampered the use of concrete in building construction in Newfoundland, thus contributing to lower productivity.

Our survey of firms in the construction industry also looked at the use of Ensolite. Ensolite is the registered trademark of a high-density closed-cell foam blanket that can be used to keep concrete warm so that it can be cured in freezing weather to allow winter construction. More expensive than substitute materials, it is superior because it is lighter, thinner, more resistant to tears and can be used many times over. Ensolite was first introduced about three years ago in Ontario and, by 1978, 26 per cent of the establishments interviewed in that province had used it.

Not one of the establishments surveyed in Newfoundland had heard of this material, although a number of firms expressed interest in it. The firms surveyed said that information on new materials like Ensolite is often brought to potential users by sales representatives of the producing firms. Ensolite is marketed through Montreal and representatives seldom, if ever, visit Newfoundland. By contrast, firms in Ontario that are centrally located with access to a large market are contacted regularly by representatives of companies producing new products.

In the bakery industry the plastic polybag was a major innovation. It increased the shelf-life of a loaf of bread by roughly 150-200 per cent over the cellophane or wax paper wrapping. The two largest bakeries in Newfoundland started using polybags in 1966, seven years after bakers in Ontario. By that time already 80 per cent of the firms surveyed in Ontario were using it. All firms in Newfoundland had adopted the polybag by 1973, three years after its use was industry-wide in Ontario.

Again we conclude that reducing the time lags in the adoption of new techniques, between regions and between firms in a particular industry, would raise the average level of national productivity.

Conclusions

Productivity growth has almost vanished in the regions in these last seven years, just as it has in the nation. Only Quebec and Alberta have so far escaped. Half of this slowdown can be explained, a good part by the recession of the mid-1970s. The other half remains a puzzle.

Our analysis reveals important differences in the levels of productivity among the regions. The differences in levels exist not only in the goods producing sectors, but also in the much larger service sector. If these differences could be reduced or eliminated, very substantial one-time gains in national productivity would be obtained.

The message from the regions is thus at once depressing and cheering. It is depressing, because it confirms the gloomy national picture on the productivity slowdown; and cheering, because it reveals scope for resolving some of the problems associated with that slowdown.

7 Conclusions and Recommendations

Top priority must now be given to achieving a better rate of growth in the real incomes of Canadians. It can be done and one of the best ways to do it is to improve productivity. There is no need for the economy to linger in its present state of stagnation.

Over the past decade, advocating faster growth of the economy may have been regarded as somewhat vulgar. Growth has now become a national imperative. We would be the first to admit that there are costs involved, and there will be barriers to be surmounted and compromises to be made. Policies designed to improve total income must be accompanied by policies that will address the issue of how that income is to be shared out. But as productivity improves and the real incomes of Canadians increase, tensions over the distribution of income will ease. What is needed now is a policy emphasis that puts real income growth first. There are a number of ways in which this could be achieved.

There are measures that might increase the supply of productive resources, for example, policies that encourage labour force participation or incentives to increase investment. At the same time, policies could be directed to improve the contribution such resources make to output by encouraging further education and training of the work force, for example.

There are also policies that attempt to increase the efficiency with which the various productive resources – labour, capital, materials and energy – are used together. Such policies might include the encouragement of faster technological change, the promotion of economies of scale, and the removal of barriers that prevent the allocation of various productive resources to their most valuable uses. The energy pricing system is one such barrier.

There are also policies designed to make sure that Canada makes the fullest possible use of all its productive resources. Monetary and fiscal policies may be directed to this end. The fact that the economy has been operating below its capacity in recent years has contributed to the productivity slowdown. Dealing with this particular problem will require

an improvement in the international economic scene, or a way of stimulating economic activity even though concerns with inflation and the federal government's deficit position are serious obstacles.

Development and implementation of any of these measures to improve productivity growth will be difficult until there is some agreement on the distributional problems – oil and gas pricing, the fiscal disparity between the federal and provincial governments and a tolerable level of inflation. In a sense, there is a vicious circle that must be broken.

Increasing the Available Resources

PEOPLE AND JOBS

Over the next decade, the population of work force age will not be increasing as rapidly as it has in the past. But the percentage of this group who participate in the labour force will still be increasing. The level of education of those in the labour force will continue to rise. There will be fewer young people or inexperienced adult workers in relation to the total labour force, so the level of experience of the labour force as a whole will also be higher.

These developments can be assisted by public policy on training, mobility and job information, to improve the effective contribution of the labour force and to increase the numbers of workers likely to hold long-term employment positions. In particular, there is a need for imaginative employment arrangements to widen the access of women, the handicapped and native people to more productive and higher-paid jobs and to make better use of their potential. Careful attention must also be paid to the effects of taxation, income support and earnings' structures on incentives to permanent labour force attachment.

We see a number of reasons for concern. Canadian industry already faces a shortage of skilled workers for certain occupations. As the expected energy-related developments come on stream, the focus of economic activity will be concentrated in the west and the north and perhaps Newfoundland, creating a demand there for large numbers of workers in a variety of occupations in which skilled workers are already in short supply. In addition, labour markets will be greatly affected as Canadian industry adapts to changing international economic circumstances, such as increasing competition from some Third World countries. And the nature and pace of technological change over the next decade, especially the so-called "electronic revolution," will mean significant changes in the demand for workers in particular occupations.

It is clear that the mobility of labour is inextricably bound up with these concerns about the availability of workers. In our society, where workers rely increasingly on social security and other services delivered by provincial governments, there may be constraints on the movement of labour. Other provincial restrictions, like occupational licencing arrangements, only serve to aggravate the problem. These barriers to mobility, which prevent workers from moving to jobs where they might contribute more to output and to their own personal incomes, frustrate the most efficient allocation of productive resources.

Many of these issues will be addressed in a major report on Canadian labour markets which the Council will publish in the coming year. Research now in progress includes the forecasting of demand for workers in different occupations, ways to evaluate occupational supply, and an examination of the system by which training needs are assessed, programs are designed and implemented and alternative training arrangements are evaluated.

For generations, Canadian industry has depended on immigrants to fill its skilled labour requirements. These workers had received on-the-job training through apprenticeship programs in their own countries. In contrast, the Canadian educational system has been more academically oriented, relying more on classroom teaching. Canada now faces a dwindling flow of skilled immigrants. Many skilled workers are nearing retirement age and programs for on-the-job training for younger workers are extremely limited. Therefore,

- 1 We recommend that the federal and provincial governments, in co-operation with business and unions, improve incentive programs designed to foster on-the-job technical training in Canadian industry.**

The Council's own survey of Human Resources indicated that there are severe shortages of workers in some areas, while high unemployment is a feature of others. Therefore,

- 2 We recommend that the federal government, in conjunction with the provinces, unions and employers extend selective labour mobility programs to provide a positive economic incentive for workers from high unemployment areas and occupations to take up job vacancies in areas, occupations and industries facing acute shortages of workers.**

If the current imbalances in labour supply and demand are not to continue for long periods, integrated programs for human resource planning, training and recruitment must be designed and implemented as early as possible. Therefore,

3 We recommend the development and dissemination of more comprehensive labour demand information on future personnel requirements than now exists, including details on timing, locations, trades and occupations involved. Information should also be made available on:

- the duration of future employment opportunities;
- where and how to obtain pre-training;
- the availability of on-the-job skill development;
- the costs of housing, board, travel and other services associated with prospective employment and any assistance in regard to these costs;
- assistance for relocation at the completion of any short-term employment;
- how and where to apply for employment positions.

Quite clearly such programs will involve outlays by governments. Under Recommendation 9 below we include them as part of a re-ordering of priorities for government expenditures.

CAPITAL AND INVESTMENT

Our work does not indicate that much of the slowing of productivity growth can be blamed on a slowing of the rate at which new plants are built or old ones expanded and the rate at which new machinery and equipment is acquired. Although our findings provide some perspective, we are the first to admit that they do not provide all of the answers. The fact is that we do not know much about the quality of investment as opposed to its sheer quantity. We are well aware that capital investment often involves new technology, but we are as yet unable to measure the importance of this factor. We are aware too that the age of the existing capital stock may vary considerably from one industry to another and that it takes much longer for some investment to result in increased production.

For a number of reasons, we believe that capital accumulation will increase substantially, using up a somewhat higher share of available resources than in recent years. This investment program will contribute to productivity improvement. Although slower population growth will mean less investment in housing, education, health and urban facilities, the reduction may not be substantial. And, while the share devoted to electricity investment (which has been unusually high in recent years) may decline in some parts of the country, such a drop will be more than offset by further increases in this area in Quebec and, more importantly, by the expansion in other energy and energy-related investment that is required to maintain self-sufficiency.

Apart from electricity, the average levels of investment in Canadian industry in the 1970s were not high enough to allow for any substantial expansion of output. Although industry has been operating below capacity in 1980, there are not vast amounts of unused capacity available. Some of Canada's major export industries, such as pulp and paper, wood products and mining, as well as industries like transportation and storage that serve them, will now have to invest to expand their capacity so that they can meet increased demand in export markets. In some cases, expansion programs are already under way. As well, some governments have been delaying investment programs for the past several years as part of the attempt to bring expenditures under better control. Finally, the backlog of investment requirements for improved environmental protection seems to be very large, and the urgency for action seems to be mounting.

Whether or not this investment in capital accumulation materializes may depend on the availability of good after-tax real rates of return, the general state of the economy and the availability of savings to finance the expansion. Uncertainty about inflation and the effect it has on investment and growth is particularly troublesome and we will discuss this later. Moreover, changing regulatory requirements, such as those for environmental protection, may also discourage investors.

It is clear too that it will not be enough simply to expand the existing capital stock. A determined attempt must be made to upgrade its quality and to incorporate new technology, including energy-saving features, so that Canadian industry will be more competitive in the face of changing international circumstances.

It has been suggested that the present system of investment incentives encourages investment in capital assets that have a long life. If it does indeed exist, this bias should be corrected. Our continuing work in this area involves an examination of existing tax incentives for investment.

Capital investment over the next decade or so may be directed mainly to large projects. Because these projects take rather a long time to come on stream, they will not contribute immediately to increased output and productivity. This makes it all the more important to give closer attention to smaller investment projects that are not related to energy.

FINANCING THE EXPANSION

An increase in Canada's stock of plant, machinery and equipment can take place only if Canadians — individuals, business and government — save more or if resources are borrowed from foreigners and devoted to investment. The increased savings required for the large investment program that we anticipate should, we suggest, come more from domestic than from foreign sources.

For many years this country has relied on foreign savings to finance an important part of its investment program. Although that borrowing has provided many advantages, it has also been reflected in the net deficits in the current account of Canada's balance of international payments, higher levels of foreign ownership of Canadian industry and increased indebtedness to foreigners. Increasingly, this foreign debt has not been matched by comparable net additions to the country's capital stock.

But if a higher proportion of investment is to be financed by Canadians, there will have to be a reduction in the current account deficit and an increase in domestic savings. Increased exports of gas, electricity and coal, expanded capacity in other export industries and transportation, and reduced imports of oil could all help to reduce the current account deficit. The large energy-investment projects will be particularly important, and it is worth repeating that a slowdown in such projects might well lead to increased rather than less use of foreign savings in the medium to long run.

We are concerned, that fears about the shorter-run consequences of these planned investments, for example their possible impact on the balance of payments, may delay implementation. Therefore,

- 4 We recommend that the federal and provincial governments take all the steps necessary to ensure that the large energy-investment projects set out in Chapter 2 above proceed without further delay.**

It may be difficult, however to increase domestic savings because rates of savings by both individuals and business are already very high. At the very least, nothing should be done to reduce savings incentives generally and care should be taken to ensure that savings are directed to the uses with the highest real rates of return. On the subject of savings incentives we would note that the maximum deduction allowable for contributions to Registered Retirement Savings Plans (RRSPs) is not now indexed. If this deduction were adjusted to reflect changes in the Consumer Price Index in the way that the personal income tax brackets are, the personal savings rate in the late 1980s would be higher by about one percentage point than it is in our base case projection. (There could, however, be some reduction in government saving.) If the personal income tax were no longer indexed, personal savings would fall but government savings would increase dramatically (see Appendix Table B-2), providing that government expenditures continued to be limited as they are in our base case projection.

Governments themselves, however, may be able to contribute a good deal more to domestic savings than at present by spending less on current goods and services – but more on this later.

INCREASING ENERGY SUPPLIES

Expanded energy supplies could play a significant role in increasing Canadian real incomes, but the pricing question will have to be resolved first. The conclusion we draw is simple. Canadian prices of oil and natural gas must move much closer to world price levels and without too much delay. The price to consumers must rise in the interests of conservation and efficient use. The price to producers must rise if Canada is to expand its energy supplies and become less dependent on risky foreign sources. And governments have legitimate claims on some of the windfall gains that will arise in the process.

This country has the potential for producing large additional supplies of energy, although the potential for supply expansion is greater for some forms of energy than others. Export surpluses are most likely for natural gas, electricity, coal and uranium. If export sales can both cover costs and earn a reasonable rate of return, they should be permitted. The possibility of self-sufficiency in crude petroleum, on the other hand, is still in the balance, though some reduction of imports from the present level would seem to be achievable on reasonable terms.

Canada still has some conventional sources of oil and gas whose production costs are far below present world price levels. Higher prices for these energy sources will provide windfall gains. But increasingly this country will be forced to depend on higher-cost sources including the tar sands and heavy oil deposits, frontier and offshore fields, and higher recovery rates from conventional fields. Producers can be induced to develop these additional supplies of oil and gas if prices are increased. Even then, for some of these sources, higher prices could involve considerable windfall gains where revenues are greater than is required to meet marginal costs and allow for normal profits, risk-taking, and the non-renewability of the resources.

It may be that, over the long run, Canadians will choose to subsidize the domestic use of more plentiful forms of energy because of considerations of the distribution of income and wealth. But subsidizing the price of imported energy will encourage less efficient use and Canada may continue to lag behind other countries in the reduction of energy consumption. There is increasing evidence from a number of countries that an increase in the price of energy is necessary to encourage conservation.

Nor is the general subsidization of domestically-produced energy for either domestic use or export in various forms any better. Perhaps the most subtle form of the argument is that energy should be made available to Canadian producers of energy-intensive goods at levels well below the world prices in order to make them more competitive internationally. Such a policy would encourage development of energy-intensive industries at the expense of industries which use relatively less energy and it

would not produce a sustained increase in Canadian jobs or income. Producers, like consumers, must adjust to higher energy prices by more efficient use.

We see a good deal of scope for improved efficiency in energy use, including the possible substitution of other energy forms for oil. More fuel-efficient vehicles can be developed for ground and air transportation, natural gas and electricity can replace oil in space heating, oil- and gas-fired thermal electrical generators can be replaced by coal or nuclear power. In some regions, coal can replace oil in commercial and industrial uses, while pulp and paper operations can use wood waste to generate their own thermal requirements.

Canada has been out-of-step with the rest of the world in its oil pricing policy. Of the major industrialized countries only the United States, the United Kingdom, Norway, Australia and Canada produce a significant portion of their oil requirements domestically. The Australian government tinkered with a two-price system until recently when it removed controls and let the price rise to world levels. Likewise, the United States had a two-price system for old and new oil but, by the end of 1981, all controls will be removed and prices will rise to the world level and will increase as world prices increase. Norway and the United Kingdom have been producing at somewhat below current world prices but have not subsidized domestic consumption on a prolonged basis.

It is clear that there must be an increase in the price of crude petroleum both to users and to Canadian producers. We believe that the price of natural gas in Canada should also increase, but that to encourage substitution the price to users should remain below that of oil of equivalent heat value. Efforts to enhance energy self-sufficiency and increased real income for all Canadians will be hampered however until some agreement can be reached as how to share out the windfall gains that these price increases will generate.

The development of offshore resources on the east coast provides a clear illustration of the problem. Until there is some decision on how to divide the gains from development of those resources, oil producers will not move ahead with full-scale development because they will be uncertain about the rate of return they can expect on the costly and risky investments required. The Province of Newfoundland will be unable to tell what its problems may be, what its revenues will be and what programs it can or should undertake and when. Exactly the same issues arise with respect to oil sands, heavy oil, secondary and tertiary recovery in conventional oil fields, and in frontier oil and gas development.

The question of how to divide the windfall gains from oil and gas is bound up intimately with the fiscal positions of the federal and provincial governments. The present producing provinces find themselves in strong

fiscal positions which will be even stronger if oil and gas prices are increased as we feel they must be. On the other hand, the fiscal positions of the non-producing provinces, and even more so the federal government, are seriously strained. For the federal government, part of the reason is that the special taxes now being levied on oil and gas resources no longer cover the subsidies that are being paid to cushion the non-producing areas against rapid increases in the price of these resources. The result is that both public investment programs and government anti-recession programs in the areas of the country where they are most needed are stalled by the difficulties of getting means and needs for action effectively aligned.

We believe that there are a number of legitimate claims on the gains that arise. The producers must have some share if they are to undertake increasingly costly or risky development of new production in Canada. They could well be discouraged if returns from exploration and development in Canada are far less than those available elsewhere. The producing provinces can hardly be expected to let the bulk of the additional gains from non-renewable resources slide away from them. They must have sufficient access to these gains so they can ensure their own energy requirements in the future and so they can develop both physical and human resources to support their income levels when the existing energy resources have been used up. The federal government and, indirectly at least, the non-producing provinces, have legitimate claims too. In the short run they require the wherewithal to cushion the impact of rapidly changing energy prices, particularly on lower-income groups. And for the longer term they too will have to undertake programs to stimulate modernization and development of other industries, and in particular, to encourage energy-saving measures and to switch to alternative forms of energy.

Increasing domestic oil prices would have an adverse impact on the inflation rate, output, real income and jobs in the immediate future. On the other hand, closing the gap between the domestic and world price would reduce the federal government deficit. The adverse impact on the economy could be reduced if the federal government undertakes to continue or extend its cushioning policies, although, of itself, such action would bring upward pressure on the federal deficit. We think that a good argument can be made for a partial transfer of the windfall gains from the producing provinces and the producers to the federal government to cover the cost of temporary import subsidies as well as of some federal participation in national energy development programs.

How high then should domestic prices be? In its 1979 Annual Review the Economic Council of Canada recommended a price increase of \$4 per barrel per year. Given recent increases in world oil prices by the OPEC cartel and the decision by the United States to lift its controls on oil prices by 1982, a domestic price increase of \$4 per barrel per year would

now only just bring Canadian prices to 60 per cent of those prevailing in the United States and the rest of the world by the middle of the decade. Of course, this is only true if our assumptions about world prices are correct; further acceleration of the world price by OPEC could again change these relationships. Thus last year's recommendation of \$4 per barrel per year should now be regarded as too low.

If the target were 75 per cent of U.S. price by the end of the decade, domestic prices would have to increase on average by \$5 a barrel for the years between 1981 and 1990. And if 85 per cent of U.S. prices were the choice then \$6 per barrel would be the required annual increment.

Whatever annual increase in price is finally adopted, then, it must take into consideration the requirements of all of the affected groups – consumers, producers and governments. The blended price scheme outlined in Chapter 2 would achieve this result, although other approaches to oil pricing may be equally valid. That scheme assumed that the wellhead price of domestic crude oil would increase by \$2 per barrel per year although users of end products would pay a price based on a blend of imported and domestic oil prices, increasing at a rate of close to \$4 a year. The difference of about \$2 could be used to reduce the contribution of general revenues to the subsidy program.

The total increase of \$4 per barrel per year would raise Canadian user prices to about 60 per cent of the world level by mid-decade. Adding a further \$1 a barrel per year to the wellhead price would bring domestic prices up to 75 per cent of the U.S. level by 1990. An extra \$2 a barrel per year at the wellhead would bring Canadian prices up to 85 per cent of the U.S. level by 1990. The blended price to consumers would then be higher by \$6-a-barrel, of which \$4 represents the increase in the wellhead price, and \$2 represents the contribution to the blending scheme. Clearly consumers would have to bear the full \$6-a-barrel increase in crude oil prices. But higher domestic prices would encourage conservation and provide incentives to move to a more energy-efficient industrial structure. This scheme would provide a short-term competitive advantage to Canadian industry because domestic prices would remain below 85 per cent of the U.S. level throughout the decade.

With the wellhead price increasing at \$4 per barrel per year and with most of the revenue going to the producing provinces and oil producing companies, the needs of both could be accommodated. This would provide incentives for exploration, development and exploitation of higher cost petroleum resources and would recognize the claim of western provinces on the windfall gains from natural resources for the purposes of their own industrial development. The remaining \$2-per-barrel-a-year increase would generate revenues for the federal government which could be used to finance national energy programs. The need to finance an oil import subsidy program from general revenues could be eliminated by

mid-decade. Such a scheme could enable all parties – the public, the producers, the producing provinces and the federal government – to pursue their individual activities without conflict. Therefore,

- 5 We recommend that the federal government announce a commitment to an increase in the domestic price of oil during the next five years of \$5 to \$6 per barrel per year, so as to reach at least 75 per cent of the U.S. price by mid-decade, and thereafter at a sufficient rate to reach at least 85 per cent of the U.S. price by the end of the decade. We also recommend that the price of natural gas consumed in Canada be increased in the 1980's, to reflect national objectives and the difference between the medium term availability of natural gas and crude petroleum.***

Higher energy prices will generate long-term benefits to the economy. They will also impose costs on Canadian consumers in all provinces, particularly in the short to medium term. While the above recommendation implies that the costs of adjustment to higher world prices will be shared broadly by all Canadians, it is vital that low income individuals and families receive special consideration. This might, for example, include measures to encourage conversion of oil furnaces to heating systems with lower operating costs, incentives to improve public transit systems, and grants to subsidize transit fares (see Recommendations 8 and 9).

In the longer run, increased domestic growth, reduced oil imports and a stronger Canadian dollar will all offset the costs imposed by higher oil and gas prices. Moreover, reduced burdens on the federal treasury will enable the federal government to reduce tax rates and/or expand programs aimed more directly at the problems of low-income groups. It is essential that the public is made clearly aware of the costs and benefits of such prices and of the progress being made toward the goals and objectives in mind. Therefore,

- 6 We recommend that the size and disposition of increased revenues resulting from higher oil and gas prices should continue to be monitored and that follow-up analyses be undertaken. Particular emphasis should be given to the effectiveness of energy policies in achieving national objectives for energy development and conservation and to the impact of these policies on inflation, employment, growth, trade and income distribution. Results of the monitoring and analysis should be made available to the public, together with details of compensatory programs that will be required to counter the more serious effects of pricing and incentive policies on income distribution. Both public and private sector revenues should be scrutinized since their social and economic impacts have many similarities.***

*See the supplementary statement by James A. McCambly at the end of this chapter.

More Efficient Combination of Resources

As well as policies to expand and improve the resources available for production, measures can be taken to improve the efficiency with which the various productive resources are combined. Some of these policies to improve productivity have been recognized before but, up to now, have not been consistently applied. Three such policies are making use of the most efficient known methods of operation, taking advantage of economies of scale, and ensuring a better allocation of resources.

EFFICIENT METHODS OF OPERATION

Whether or not firms have access to the most efficient methods of operation is closely linked with the process of technological change, especially the innovation and diffusion stages. At any one point in time some firms are using the most advanced technology, or "best practice" methods, while others operate further, and sometimes much further, behind the leading edge of technological possibility. In some areas of technology Canada as a whole lags behind other countries and some regions within Canada lag behind others. Closing these gaps promises rapid and significant gains in productivity and growth.

Public policies to encourage this development must focus on industrial rationalization, improved competition, transportation and communications, more efficient financial markets, and training of managers and workers. In particular, trade associations, universities and public agencies could all be strengthened so that they can transmit information on innovative opportunities and provide expert advice if necessary.

During the coming year, the Council will issue reports on the process of technological change in Canadian industries. These studies look at how Canadian industries develop advanced technologies and how multinational enterprises decide whether or not to make advanced technologies available to the Canadian economy by different means. Lags in introducing these technologies are influenced by the size of the market, the origin of the control of firms, and the way in which technology is transferred. The broad conclusion which emerges from these studies is that Canadian firms should be provided with access to the widest possible range of sources of new technology from which to develop their innovations.

ECONOMIES OF SCALE

Although the Council has not undertaken any detailed work recently on economies of scale, we are convinced that there are many possibilities for increasing productivity in this way.

The detailed work reported in Chapter 5 did not explicitly reveal evidence of plant economies of scale to any significant extent in the industries examined. That is not surprising; the accounting and financial type of data on which that work was based rarely does reveal such evidence. By contrast, studies based on engineering and physical production data have frequently shown the presence of plant-specific economies.

More generally, however, there is a good deal of evidence for Canada as well as other countries to confirm the widespread existence of economies of scale in the production of specific products and in the choice of appropriate production processes. Again, our own new work is not far enough advanced to provide much further corroboration. We know from earlier work at the Council, for example, that substantial product-specific economies were achieved in the manufacture of automobile parts and, even more so, in automotive assembly, through the greater specialization that followed on the Canada-U.S. Automotive Agreement. In our work on sources of productivity growth (see Chapter 5, Table 5-2 and Appendix Table C-1) those economies are reflected in a sharp jump in the use of material inputs in these industries in the 1966-73 period. We suspect that product-specific economies in other industries are similarly concealed and we are undertaking further work in this area.

Manufacturers in larger markets can take advantage of economies of scale in the production of specific products that lead to higher levels of productivity, while there are neither the incentives nor the competitive pressures to attain the same results in the smaller protected domestic market. The provision of wider markets in an internationally competitive setting through the mutual lowering of trade barriers by Canada and other countries remains perhaps the single most promising route to the achievement of this type of scale economy. Further opportunities of this type will be offered to Canadian industry over the next few years as the tariff reductions agreed to in the recently-concluded multilateral trade negotiations known as the Tokyo Round are implemented. But a great deal remains to be done to reduce and monitor non-tariff barriers, such as government purchasing policies, the presence of which can easily offset the gains from tariff protection. And, of course, the opportunities that are offered cannot be fully exploited without appropriate domestic policies of adjustment assistance.

In the past, the Council has suggested also that with increasing international competition there is a good deal of room for easing Canadian competition policy as it relates to mergers and export agreements. We will begin reporting shortly on the results of new studies we have undertaken to relate industrial organization and other factors to productivity and profits.

Without doubt then, there are many opportunities to achieve scale economies. Canada might stand to gain by fuller use of existing econo-

mies of scale in multi-plant operations. Similarly, it would be to this country's advantage to see that domestic barriers to the movement of both goods and labour do not become significant.

BETTER ALLOCATION OF RESOURCES

The opportunities that may exist for increasing productivity cannot be fully realized so long as there are impediments including public, or for that matter private, policies that constrain the flow of people, capital and other productive resources into areas, industries and occupations of higher actual or potential productivity. Such impediments now exist in both markets for factors of production and markets for final products.

We have already discussed energy pricing and the distorting effect this has on the efficiency of the economy. We have also mentioned our concerns about the effective functioning of labour markets. Similar concern has led the Council to undertake an examination of financial markets to determine if financial capital is being funnelled to its most productive uses. Early this coming year, we will, for example, be releasing a report on the availability of capital for small business development. The Council's report on regulation reform will also discuss how productive efficiency could be affected by regulation.

CONCLUSIONS

Since the bulk of our work on productivity is still in progress, the Council is not yet in a position to make detailed recommendations on the subject. But we believe that the new techniques of productivity research are sufficiently well advanced to support a profitable marriage of existing economic expertise and the vast amount of knowledge of physical production characteristics at the level of the industry and firm. What is required now is the institutional arrangement for moving rapidly in that direction. Indeed, the industry task forces set up with the assistance of the Department of Industry, Trade and Commerce may be appropriate for the purpose. However it is the principle that we wish to emphasize. Therefore,

- 7 **We recommend that a new effort be instituted to analyze the various influences on productivity improvement and to develop appropriate programs that will lead to higher productivity growth rates at the level of the firm, including firms in the service sector.**

The Utilization of Capacity

We have already suggested that there are reasonably good prospects for increasing real incomes in the period ahead through policies to expand

and improve the resources available for production and through policies to enhance the efficiency with which the various productive resources are combined. The fact remains that at present this country is not making full use of its available human resources and of its plant, machinery and equipment. This situation is likely to continue for some time to come. The unsatisfactory level of total output itself tends to reduce the efficiency with which our productive resources are combined.

Our analysis has suggested that Canada's potential growth rate is now lower than it was in earlier years and that at the moment, the economy is operating well below even that potential. Our base case projection suggests that a gap between actual and potential output is likely to persist well into the mid-1980s.

The catch is that no one policy package can bring improvement in all the key policy areas. We are forced to recognize the existence of trade-offs. The use of demand management policies to stimulate the economy at this time could bring somewhat better employment, real growth and even productivity performance. It would put additional upward pressure on inflation rates. But even without such policies, there will be upward pressure on Canadian prices, because of rising prices of oil and other internationally-traded goods and because the continued decline in real wages will eventually lead to greater pressure for wage increases. In these circumstances, we are convinced that complete inaction with the concomitant loss in jobs and real output is not the best course. But any action to stimulate demand should be targeted directly at raising Canada's medium- to longer-term growth potential and at reducing the gap between actual and potential output.

In present circumstances, the Council would see such a strategy as involving more a re-direction of tax and expenditure programs rather than general decreases in taxes or general increases in expenditure. Therefore,

- 8 We recommend that the federal government give consideration to continuing and expanding personal and corporate incentives directed to energy conservation, especially those related to insulation, construction, and substitution of more abundant energy sources for oil.
- 9 We further recommend that there be some redirection of expenditure to accord higher priorities to outlays on such programs as transportation, storage and handling networks, especially those associated with the movement and export of western wheat, programs to more effectively upgrade labour skills and to improve the functioning of labour markets, programs that might assist in accelerating the large energy investment projects, and programs to increase the pace and range of innovation.

Implementation of these recommendations would help to achieve the important objective of job creation while raising Canada's longer-term growth potential.* If it is necessary to increase government expenditures to reflect these priorities, we would suggest that such increases be matched over the medium term by increased government revenues (if needs be, by higher tax burdens).

Distributive and Institutional Obstacles

The lower the rate of real economic growth – and it is now virtually zero – the more serious the conflicts over shares of the income that is generated. We have already noted that disputes over energy prices and the division of windfall gains from oil and gas will hamper efforts to increase real income for all Canadians. The problem of intergovernmental fiscal relations and the effects of inflation will also make it more difficult to expand output and real income. Such conflicts contribute to uncertainty, and the continuing confrontation that results may either paralyze decision-makers or lead them into beggar-thy-neighbour policies that balkanize the country.

Unless this vicious circle of slow growth, indecision and further slowing of growth is broken, economic stagnation will continue. Breaking the deadlock will involve making various groups in the country aware that even with the best will in the world, decisions on how income is to be distributed will involve losses for some, at least in the short run.

Of course, not all uncertainty can be removed. But business is better able to cope with market uncertainty; it is uncertainty over policy direction that is most worrying. Both business and consumers are better able to adjust their conduct to a known set of rules about distribution, even though those rules are onerous, than to uncertainty. And such adjustments will be necessary to ensure that all can benefit, though perhaps to varying degrees, from expanding output and real income in the longer run.

FISCAL DISPARITIES

The restructuring of Canada's federal-provincial fiscal system over the past fifteen years has brought many positive developments. Measures such as the indexation of personal income taxes and block funding by the federal government for "established" programs in certain fields have

*See the supplementary statement by James A. McCambly at the end of this chapter.

been incorporated into the tax and expenditure system. But these changes have also left the federal government in particular with unusually difficult tasks and limited room for manoeuvre.

The federal government has a responsibility and indeed it is the only government with the scope to provide sustained and balanced economic growth in all areas of the country and to ensure equitable levels of access for all citizens to jobs, incomes and public goods and services. These responsibilities would be difficult enough to exercise in any period of slow growth. But recently the difficulties have been compounded by the way in which oil revenues are shared and by the effects of ever-increasing energy prices.

The expansion of Canada's industrial potential and, with it, the improvement of real incomes that we have advocated, cannot be achieved without some attempt to cushion costs of adjustment, such as adjustment to higher oil prices. This country has long accepted the principle that costs of adjustment or displacement resulting from developments in the international economy should be shared to some degree so that they do not fall too heavily on specific workers or industries, perhaps even driving out of business some firms that would be viable in the long run. In recent years Canada has made great strides towards closing the gaps in the access of its citizens to a variety of social programs such as education and health care offering special treatment for older people and disadvantaged groups. There is some danger that in periods of slow growth the remaining "holes in the fabric" could be widened rather than narrowed.

Given some modicum of agreement on the sharing of revenues from energy development, that development seems likely to go ahead on its own. But re-allocation of resources, and particularly capital, towards the energy sector cannot be viewed as the sole, or even the principal, means of expanding potential output and income. There are opportunities for expansion in other resource-based industries such as mining, forestry and agriculture and for manufacturing industries based on them. And, in still other industries, particularly in the manufacturing sector and in the export industries, there are opportunities for high rates of technological innovation that must be exploited.

Policy action to spur such industrial development, to cushion certain regions from the effects of too rapid adjustment, and to close the gaps in social programs cannot be undertaken by the energy-rich provinces alone. It will have to involve the other provinces and especially the federal government. In these circumstances, we believe that a strong case can be made, for:

- relieving the burden on the federal treasury of the imported oil-price subsidization program even in the short run;
- reducing the overall government sector deficit in the medium run;

- re-arranging the composition of the total government sector surplus/deficit position, with smaller deficits for the federal government and the fiscally weaker provincial governments and smaller surpluses for the stronger provinces.

With respect to the first of these suggestions, the Council is of the view that the federal government should have access to sufficient revenue from the proposed increase in oil and gas prices to support the existing oil-price subsidization program until it is phased out later in the decade. Our simulations suggest that some rearrangement of this type can provide considerably more fiscal manoeuvring room than at present without reducing real income, or increasing unemployment. Therefore,

10 We recommend that the present oil-revenue sharing arrangements be re-constituted to provide the federal government with sufficient revenues to support the existing subsidization arrangements for the limited time that they will continue.

We are very much aware, however, that the uncertainty surrounding future sharing arrangements is a greater problem than even the present fiscal imbalance. Thus, resolution of the immediate sharing issue in any way, even if it should involve somewhat less additional federal revenues for the time being, is to be preferred to the continued uncertainty.

We have already mentioned that some borrowing by governments is now being used to support current expenditures. Such spending is above what is required for stabilization purposes. In other words, greater consumption by the present generation of Canadians is at the expense of future generations. Therefore,

11 We recommend that over the medium term, the federal and appropriate provincial governments should reduce their deficits as economic recovery takes place, economic growth becomes more satisfactory and increased revenues arise from expansion of selected revenue bases; thus, over the medium term, if government expenditures increase more rapidly than in our base case projection, the governments should increase taxes. However, these governments should not now increase tax rates in order to reduce deficits.

For the medium to longer term, we see a need for a re-examination of the allocation of expenditure responsibilities or the access to revenue sources. These responsibilities shift in importance from time to time as a result of demographic changes (many provincial expenditure programs are strongly influenced by population trends) or because one level of government is better able to cope with the problem of the day than the other.

The principle of the need for flexibility in these arrangements was recognized in the fiscal restructuring of the 1960s and early 1970s and it

remains valid today. In considering the possible 1982 revisions in Established Program Financing under the Fiscal Arrangements Act, it may be necessary to reduce (or restrict the growth of) the revenue transfers from the federal to the provincial governments. This would have the effect of placing more of the burden of financing the services, which are mainly provided by provincial programs, directly on the provinces. In any such shift, adjustments in equalization would also have to be considered to ease the increased burden on those provinces which have a weaker tax base.

The massive shifts in wealth among provinces associated with changes in resource revenues may also have to be reflected in the equalization formula or in separate but related federal-provincial fiscal arrangements. The possible rearrangements in the federal fiscal system for Canada will be a matter of great concern over the next year or two. The Council is now engaged in a program of research and review in these areas, and expects to publish papers and reports on these matters during the next year.

INFLATION

The evidence on the direct impact of inflation on the growth of the economy is somewhat conflicting. Of course, if this country's prices are rising faster than those of its trading partners, its international competitiveness can suffer. And hyper-inflation has in the past brought some economies to the point of collapse. But the impact of more moderate rates of inflation on the distribution of income can be a deeply disturbing source of conflict and hardship.

Inflation risks are now higher than they were a year ago. The projection of inflation in our base case is more likely to turn out to be too low than too high. Even the base case projection assumes a cumulative increase in the Consumer Price Index of 72 per cent from 1979 to 1985 and 155 per cent from 1979 to 1990. In other words, a person who retired in 1979 with a fixed dollar pension of \$10,000 a year could see the purchasing power of that pension reduced to \$5,800 by 1985 and to \$3,900 by 1990, a period well within the life expectancy of someone who retired last year. The base case projection of inflation as measured by the implicit price index for consumer goods and services is not quite so high, but there is not much difference on a cumulative basis.

It is true that there has been a good deal of progress in Canada in calculating inflation-adjusted measures of economic variables that give a clearer picture of the real changes in the positions of various groups and institutions. Personal savings rates, for example, when adjusted for inflation, have turned out to be not much higher than they were in the past. Inflation-adjusted measures of government deficits suggest that

there is much less fiscal ease in the system than would be implied on the basis of the unadjusted dollar figures. Similarly, the balance-of-payments deficit turns out to be much smaller in real terms.

These inflation-adjusted measures are important in two ways. The adjusted measures of the balance of payments and government deficits suggest, for example, that aggregate demand policies can be set to provide more stimulus or less restraint than if judged on the basis of the nonadjusted figures. If government deficits are not really as large as they are made out to be, then stimulative actions which would increase government deficits might be more feasible. Such an argument has to be balanced however by the fact that the problems are really being transformed rather than decreasing in size or disappearing. That is, instead of being fiscal policy or balance-of-payments problems in the narrow sense, they become debt management and portfolio balance problems which are not necessarily less severe or easier to cope with.

Inflation-adjusted measures also point to ways in which the system can be adapted to inflation. There have been a number of suggestions for changes in the tax system that would reduce the impact of inflation on business. There has also been increasing use recently of Cost of Living Allowance (COLA) clauses in wage agreements, floating interest rate bonds, a reduction in the importance of long-term bonds in debt markets and an increase in the use of automatic indexing for public and private contracts and programs. These are not necessarily bad developments. If somehow the process of winding down inflation can be started, they may help to maintain the momentum. But if inflation rates start to increase, these measures may make it more difficult to avoid a burst of inflation being transformed into a higher underlying rate of inflation.

Quite clearly, even with present rates of inflation concerted efforts will have to be made to overcome some of the continuing distributive problems caused by the impact of inflation on contractual arrangements. In its study of Canada's retirement income system published late last year, for example, the Council drew attention to the particularly severe problems of inflation adjustment in private pension plans. And if Canada continues to suffer from high and sometimes accelerating inflation rates, much more drastic changes than now contemplated would have to be made in the forms in which people hold assets, in a variety of financial instruments and in company and government finance.

Our Annual Review last year dealt at some length with the impact of inflation on business incomes and we made recommendations on how this should be tackled through the tax system. These matters deserve renewed attention and policy action particularly in view of the fact that inflation may add to the uncertainty surrounding investment decisions. Both the level of inflation and the risk of accelerating inflation in Canada are now higher than they were before. Broadly-based professional bodies, such as

the Canadian Institute of Chartered Accountants and the Canadian Manufacturers' Association, have made well-considered submissions on the subject. Other bodies, including the Department of Finance, have produced estimates of the way inflation distorts business income. We still feel that the issue of inflation as it relates to the taxation of business income ought to be tackled directly rather than as a by-product of incentive tax measures which were designed to deal with other issues.

More generally, the Council concludes that the risks of inflation are so great that its control must continue to be given considerable weight in Canadian economic policy. It will be important to understand, however, that over the medium term the sources of inflation will include not only aggregate demand and pressure from the wage side to protect real incomes but also supply-side initiatives in energy pricing and taxation. If, in the face of these pressures, fiscal policy and, even more so, monetary policy are to be effective in bringing inflation below the rate we have projected, price expectations will have to be lowered. Monetary restraint will be important in this respect but the achievement of monetary policy targets will have to take into account the several sources of inflation.

Lower actual and expected rates of inflation will make it less difficult to undertake policies to stimulate growth. In turn, increased real growth can contribute to reducing inflation both directly, by increasing supplies of goods and services, and indirectly, by creating the social and economic conditions that would permit more active anti-inflationary measures.

Conclusions

The problems associated with prolonged slow growth give policies for improving productivity and real income a greater social urgency now than they have had for many years. But are such policies feasible? It may be possible to use economic policy to stimulate the demand for goods and services and improve productivity by ensuring that the economy is making full use of its productive capacity. It is possible to improve future incomes by encouraging savings so that more plant, machinery and equipment are owned by Canadians. And it is surely possible to resolve some of the distributive issues which are now impeding our progress.

Certainly governments have an obligation to improve the environment in which business and the economy in general function – to strengthen the market economy. But many people would have serious doubts about the ability of governments to intervene directly in the economy to improve productivity. Those who hold this view would argue that business itself knows best how to improve efficiency.

The idea that the market knows best cannot be lightly dismissed. The unhappy experiences with micro-economic management in the planned

economies are sufficient testimony to that. But this philosophy cannot, by definition, be applied to those parts of the economy where the market system does not operate, or where it operates in a limited way. The size of these sectors is not generally recognized. Together, they account for close to one-third of the gross national product.

All told, the areas where a strong case can be made for government policy interference in the innovation-productivity improvement process probably make up about half of the gross national product. The other half includes manufacturing (just over one-fifth of GNP), finance, insurance and real estate (about a tenth of GNP), wholesale trade, mining, and the larger private companies in construction, transportation, communication, and retail trade and other service industries. Even in this half of the economy it can be argued that productivity development depends in part on information flows among firms, regions and countries, and on research and development, for neither of which the private market may provide adequately.

It is clear, then, that there is a role for government-sponsored policies that bear directly on productivity. In some areas though, the market may indeed know best. In the final analysis, if Canada is to achieve a better rate of growth in real income, all participants in the economy must be involved. It is only through co-operation between government, business and labour that the climate of uncertainty can be changed.

Supplementary Statement by James A. McCambly

OIL PRICES

Canada can only be self-sufficient in oil if Canadians are prepared to pay more to recover unconventional oil reserves. The benefits from increased prices in terms of conservation, increased nonconventional oil production, higher recovery rates, and development of alternative energy sources can be substantial. But the hardship resulting from higher prices, reflected in rising costs and inflationary pressures, are also severe. The oil price change must, therefore, be carefully considered in conjunction with inflationary pressures and other social costs such as record high interest rates and unemployment.

Increasing oil prices will lead to accumulations of vast amounts of capital with the same degree of certainty that taxes build capital. The question is who will accumulate the capital and what will it be used for.

I would oppose any increase in oil prices without assurance that windfall profits would not accrue to companies producing oil by existing

conventional production methods. A two-price system at the wellhead may be an answer. The wellhead price currently going to conventional oil producers is already generating handsome profits.

I do not subscribe to the theory that windfall profits from conventional oil will be reinvested by oil companies in the best interest of Canadians who are paying the shot. Revenue derived from increased oil prices should not only go towards exploration; it should also be ploughed into alternate forms of energy and technology in order to reduce consumption and promote the increased domestic use of natural gas. Proper redistribution of revenue can only occur when the increased capital is redirected by government.

By the same token, governments, be they federal or provincial, should ensure that their increased revenues will be ploughed back into areas of economic benefit to the nation. Only with this type of reinvestment can we expect to create more employment opportunities than we will lose as a result of increased costs and inflationary pressures created by increased oil and gas prices.

UNEMPLOYMENT

In my opinion, the Seventeenth Annual Review fails to recognize and come to grips with the record high unemployment that exists in this country and that is expected to continue in some regions for some time to come. Unemployment itself is as serious and important as any other shortfall in the economy.

Appendixes

A External Environment Assumptions and Their Effects on Selected Indicators

Table A-1

External Environment Assumptions, Four Cases, 1980-1990

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
	(Percentage change)										
OECD industrial production											
Base case projection	-1.7	1.2	5.1	5.0	4.4	3.6	3.6	3.4	3.8	3.5	3.5
Medium U.S. outlook	-	1.5	4.7	4.6	4.3	3.7	4.0	3.7	3.8	3.6	3.6
High U.S. outlook	-0.1	1.8	4.6	4.5	4.3	3.9	3.8	3.7	3.8	3.6	3.7
16th Annual Review outlook	1.4	3.8	4.0	4.2	4.1	4.1	4.1	4.1	..	..	..
Overseas countries industrial production											
Base case projection	2.1	2.1	3.4	4.6	4.4	4.4	4.5	4.5	4.5	4.5	4.6
Medium U.S. outlook	2.1	2.1	3.4	4.6	4.4	4.4	4.5	4.5	4.5	4.5	4.6
High U.S. outlook	2.1	2.1	3.4	4.6	4.4	4.4	4.5	4.5	4.5	4.5	4.6
16th Annual Review outlook	3.6	4.2	4.5	5.0	5.1	5.0	4.9	4.8	..	..	..
Crude petroleum international price -											
Canadian dollars											
Base case projection	63.5	11.1	9.7	10.6	9.4	9.2	9.0	8.8	8.8	8.7	8.8
Medium U.S. outlook	63.5	11.1	9.7	10.6	9.4	9.2	9.0	8.8	8.8	8.7	8.8
High U.S. outlook	63.5	11.1	9.7	10.6	9.4	9.2	9.0	8.8	8.8	8.7	8.8
16th Annual Review outlook	25.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	..	..	..
United States real GNE											
Base case projection	-1.3	0.5	3.6	2.7	3.0	2.0	2.4	2.4	2.9	2.2	2.2
Medium U.S. outlook	0.1	0.8	3.5	3.2	3.2	2.5	3.2	3.0	3.0	2.8	2.8
High U.S. outlook	0.2	2.4	3.9	3.3	3.6	3.3	3.4	3.5	3.5	3.3	3.3
16th Annual Review outlook	0.5	2.9	2.8	3.0	2.9	2.9	3.0	3.0	..	..	..

U.S. industrial production											
Base case projection	-3.5	0.7	5.9	5.2	4.4	3.2	3.2	2.9	3.4	2.9	2.9
Medium U.S. outlook	-1.1	1.3	5.3	4.7	4.2	3.3	3.8	3.3	3.5	3.1	3.1
High U.S. outlook	-1.1	1.6	5.2	4.5	4.2	3.6	3.5	3.3	3.4	3.2	3.2
16th Annual Review outlook	0.3	3.6	3.8	3.9	3.6	3.6	3.6	3.8	..	..	..
U.S. consumer price index											
Base case projection	14.0	11.2	10.1	8.2	8.3	9.2	9.3	9.8	8.6	8.2	8.2
Medium U.S. outlook	14.2	10.9	9.0	8.0	7.3	8.3	8.3	8.5	7.5	7.2	7.2
High U.S. outlook	14.0	9.7	7.8	7.2	7.4	8.2	8.2	8.5	7.5	7.2	7.2
16th Annual Review outlook	11.8	8.9	7.5	6.6	6.7	6.3	6.5	6.2	..	..	..
(Per cent)											
U.S. unemployment											
Base case projection	7.5	8.4	7.9	7.4	7.1	7.1	7.0	7.0	6.9	6.8	6.7
Medium U.S. outlook	6.7	7.4	7.0	6.5	6.1	6.1	5.9	5.8	5.6	5.4	5.4
High U.S. outlook	6.7	7.2	6.9	6.5	6.1	5.9	5.9	5.7	5.5	5.3	5.3
16th Annual Review outlook	7.6	8.2	8.2	7.9	7.6	7.3	6.9	6.5	..	..	..
U.S. short-term interest rate											
Base case projection	11.3	10.4	8.9	8.7	8.6	9.0	9.1	9.4	8.7	8.6	8.6
Medium U.S. outlook	13.8	10.8	9.1	8.9	8.9	8.5	8.4	8.5	8.2	8.1	8.1
High U.S. outlook	13.8	10.2	9.1	8.8	8.7	8.3	8.3	8.6	8.1	7.9	7.9
16th Annual Review outlook	8.3	7.9	8.0	7.9	7.8	7.7	7.6	7.5	..	..	..

SOURCE Latest available projections of Wharton Econometric Forecasting Associates, Philadelphia, Pa., August 1980, except "16th Annual Review outlook" which was based on their August 1979 projections and base case projections, Economic Council of Canada, CANDIDE Model 2.0, August 1980.

Table A-2
Effect on Selected Indicators of Alternative External Environment Assumptions, 1980-1990

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
	(Percentage change)										
Gross national expenditure (1971\$)											
Base case projection	-0.4	1.4	3.1	3.5	3.3	2.4	2.7	3.1	2.6	2.2	2.6
Medium U.S. outlook	--	1.1	3.3	3.8	3.4	2.4	2.9	3.3	3.0	2.4	2.7
High U.S. outlook	--	1.5	3.6	3.8	3.4	2.5	2.9	3.4	3.1	2.6	2.8
16th Annual Review outlook	1.2	4.0	4.0	3.4	2.7	2.1	2.6	3.1	--	--	--
Consumer price index											
Base case projection	9.8	10.6	9.9	9.0	9.0	8.7	8.1	8.4	7.9	8.1	8.2
Medium U.S. outlook	10.1	10.5	9.7	9.0	8.9	8.3	7.9	7.8	7.7	7.7	7.8
High U.S. outlook	10.1	10.1	9.6	8.8	8.9	8.3	7.9	7.8	7.5	7.6	7.8
16th Annual Review outlook	8.2	9.6	9.9	9.1	9.3	8.2	7.2	7.2	--	--	--
Output per person-hour											
Base case projection	-2.3	-0.7	0.9	1.3	1.1	1.0	1.4	1.4	1.2	1.0	1.3
Medium U.S. outlook	-2.2	-0.8	0.9	1.5	1.1	1.1	1.5	1.7	1.3	1.1	1.3
High U.S. outlook	-2.2	-0.5	1.0	1.5	1.1	1.1	1.5	1.7	1.4	1.3	1.4
16th Annual Review outlook	-1.1	0.6	1.0	1.0	0.8	1.2	1.6	1.6	--	--	--
	(Per cent)										
Unemployment rate											
Base case projection	7.9	8.0	7.5	7.0	6.7	6.5	6.5	6.1	5.9	5.9	5.6
Medium U.S. outlook	7.7	7.9	7.3	6.8	6.4	6.2	6.2	5.9	5.5	5.5	5.2
High U.S. outlook	7.7	7.8	7.0	6.6	6.1	6.0	6.0	5.6	5.3	5.2	4.9
16th Annual Review outlook	7.7	6.9	5.9	5.3	5.0	5.4	5.7	5.6	--	--	--
	(Percentage of GNE)										
Federal surplus or deficit (-)											
Base case projection	-3.8	-4.0	-3.6	-3.3	-2.5	-2.5	-2.4	-2.3	-1.9	-1.7	-1.3
Medium U.S. outlook	-3.9	-4.0	-3.5	-3.2	-2.5	-2.4	-2.2	-2.0	-1.7	-1.4	-1.0
High U.S. outlook	-3.9	-3.8	-3.3	-3.1	-2.2	-2.2	-2.0	-1.9	-1.5	-1.2	-0.7
16th Annual Review outlook	-3.1	-2.5	-2.0	-1.6	-1.0	-1.2	-1.3	-1.2	--	--	--

SOURCE Same as for Table A-1.

B Fiscal Position and the Effects of Selected Fiscal Actions

Table B-1

Provincial Government Surplus or Deficit (-), National Accounts Basis, 1967-1978

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
							(Millions of dollars)					
Newfoundland	-279	-249	-227	-249	-344	-406	-455	-644	-882	-876	-1,006	-1,114
Prince Edward Island	-73	-70	-64	-81	-97	-113	-126	-169	-230	-248	-271	-300
Nova Scotia	-404	-451	-416	-437	-508	-507	-610	-898	-1,215	-1,365	-1,633	-1,832
New Brunswick	-242	-238	-249	-244	-318	-351	-408	-568	-887	-992	-1,174	-1,256
Quebec	479	441	696	453	79	18	-82	-464	-2,304	-2,762	-3,143	-3,608
Ontario	1,389	1,506	2,221	1,701	1,628	1,862	2,567	3,014	230	1,093	-388	-1,976
Manitoba	-137	-137	-104	-116	-163	-184	-227	-168	-384	-447	-579	752
Saskatchewan	-134	-156	-156	-252	-244	-288	-246	41	-246	-180	-288	-299
Alberta	-240	-119	5	67	67	117	476	2,671	2,716	2,909	3,222	3,458
British Columbia	259	390	633	457	520	476	943	909	296	520	508	460

SOURCE Based on data from Statistics Canada.

Table B-2
Effect on Selected Indicators of Personal Income Tax and of Indexation of Registered Retirement Savings Plans,
1980-1990

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Gross national expenditure (1971\$)						(Percentage change)					
Base case projection	-0.4	1.4	3.1	3.5	3.3	2.4	2.7	3.1	2.6	2.2	2.6
Non indexation of personal taxes	-0.4	0.9	2.5	2.8	2.6	1.7	1.9	2.5	2.1	1.6	2.1
Half indexation of personal taxes	-0.4	1.1	2.8	3.1	2.9	2.1	2.3	2.8	2.4	1.9	2.3
No erosion of RRSPs	-0.4	1.4	3.1	3.4	3.2	2.3	2.5	3.0	2.5	2.1	2.5
Real disposable income											
Base case projection	0.5	--	1.3	2.1	1.8	2.1	2.4	2.4	2.3	2.1	2.7
Non indexation of personal taxes	0.5	-1.5	-0.5	0.3	0.1	0.3	0.4	0.5	0.2	0.1	0.6
Half indexation of personal taxes	0.5	-0.7	0.4	1.2	1.0	1.2	1.5	1.6	1.3	1.1	1.6
No erosion of RRSPs	0.5	0.1	1.3	2.1	1.8	2.0	2.4	2.4	2.2	2.0	2.6
Federal surplus or deficit (-)						(Billions of current dollars)					
Base case projection	-10.8	-12.5	-12.8	-13.3	-11.4	-12.5	-13.4	-13.8	-13.1	-12.7	-10.5
Non indexation of personal taxes	-10.8	-11.1	-9.5	-7.8	-3.6	-1.9	1.0	5.3	11.1	17.5	26.4
Half indexation of personal taxes	-10.8	-11.8	-11.2	-10.5	-7.4	-7.1	-6.1	-4.2	-0.9	2.8	9.0
No erosion of RRSPs	-10.8	-12.5	-12.9	-13.5	-12.0	-13.6	-14.9	-15.9	-15.7	-15.8	-14.3
Provincial surplus or deficit (-)											
Base case projection	2.7	4.5	6.1	7.3	8.7	10.0	10.5	11.0	10.4	9.7	9.1
Non indexation of personal taxes	2.7	5.0	7.1	8.8	10.5	12.4	13.8	15.3	16.0	16.6	17.8
Half indexation of personal taxes	2.7	4.7	6.6	8.1	9.6	11.2	12.2	13.2	13.3	13.3	13.5
No erosion of RRSPs	2.7	4.5	6.1	7.2	8.4	9.5	9.9	10.3	9.5	8.7	7.9
Personal saving rate						(Per cent)					
Base case projection	10.1	9.5	9.2	9.1	8.8	8.6	8.5	8.3	8.1	7.9	7.6
Non indexation of personal taxes	10.1	9.2	8.4	8.3	8.0	7.8	7.5	7.1	6.8	6.5	6.2
Half indexation of personal taxes	10.1	9.4	8.8	8.7	8.5	8.2	8.1	7.7	7.6	7.2	7.0
No erosion of RRSPs	10.1	9.5	9.2	9.4	9.4	9.3	9.4	9.2	9.2	9.0	8.9

SOURCE Economic Council of Canada, CANDIDE Model 2.0, August 1980.

C Estimating the Effects of Factors Influencing Productivity

The analysis presented in Tables C-1 and C-2, shows estimates of how different variables have contributed to productivity growth. Growth in labour productivity (gross output per person-hour) in manufacturing industries is shown in column (1), while the contribution of different variables is presented in columns (2) through (9). Inputs per person-hour – capital, energy and materials – are shown in columns (2), (3) and (4). Capacity utilization, plant scale, and labour force composition appear in columns (5), (6) and (7). The column headed 'technical change' represents only a steady time trend as described in Chapter 5, and assumes no change in the trend for the 1974-76 period. The 'residual' is that portion of labour productivity growth not accounted for by the other variables. The final column, 'total factor productivity' represents that portion of labour productivity growth not accounted for by the rate of growth in inputs per person-hour.

Table C-2 presents data for non-manufacturing industries and in this case, information on energy and materials has been combined because separate data were not available. The combined data are shown in column (3) labelled 'intermediate inputs'. The following example may assist the reader to interpret the tables presented in this appendix. Taking 'total manufacturing' for 1967-73 at the top of Table C-1, actual labour productivity grew at an average of 4.26 per cent per year during this period (column 1). Growth in capital inputs per person-hour during this same period contributed 0.35 percentage points (column 2) to the total of 4.26. Annual changes in labour force composition (column 7) during 1967-73 actually pulled labour productivity growth down because the growing proportion of inexperienced workers in the labour force meant labour productivity was 0.30 percentage points lower than it would have been if the average experience level had remained constant over the period. Adding up the numbers shown in columns (2) through (9) gives a total of 4.26, which is the percentage increase in labour productivity for the period.

The table indicates, for example, that actual labour productivity growth in the manufacturing industries fell from 4.26 per cent per year in the 1967-73 period to 1.35 per cent per year over the 1974-76 period. But

(text continued p. 162)

Table C-1
Contributions to Changes in Gross Output per Person-Hour, Manufacturing Industries, 1958-1976

	Percentage change in									
	gross output per person-hour									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Capital	Energy	Materials	Capacity utilization	Plant scale	Labour force composition	Technical change	Residual	Total factor productivity	
	(Percentage points)									
Total manufacturing										
1958-1976	3.43	0.30	0.07	2.33	-0.09	-0.14	-0.33	1.32	-0.03	0.74
1958-1966	3.48	0.19	0.08	2.32	0.13	-0.20	-0.33	1.32	-0.04	0.89
1967-1973	4.26	0.35	0.07	2.91	-0.07	-0.11	-0.30	1.32	0.09	0.94
1974-1976	1.35	0.48	0.03	1.03	-0.83	-0.01	-0.29	1.32	-0.37	-0.18
Total durables										
1958-1976	3.77	0.24	0.06	2.58	-0.13	-0.26	-0.45	1.70	0.04	0.90
1958-1966	3.79	0.15	0.07	2.51	0.07	-0.38	-0.45	1.70	0.13	1.06
1967-1973	4.58	0.27	0.06	3.19	-0.11	-0.23	-0.41	1.70	0.12	1.06
1974-1976	1.81	0.42	-0.01	1.42	-0.90	0.05	-0.40	1.70	-0.46	-0.02
Wood										
1958-1976	2.39	0.31	0.09	1.55	-0.15	-0.27	--	0.53	0.34	0.44
1958-1966	2.41	0.07	0.14	1.55	-0.06	-0.28	--	0.53	0.46	0.65
1967-1973	2.09	0.50	0.09	1.29	-0.02	-0.39	--	0.53	0.11	0.22
1974-1976	3.03	0.59	-0.02	2.14	-0.94	0.01	--	0.53	0.73	0.33
Furniture and fixtures										
1958-1976	2.43	0.25	0.02	1.54	-0.18	--	--	0.79	--	0.62
1958-1966	2.63	-0.02	0.02	1.53	0.43	--	--	0.79	-0.13	1.10
1967-1973	3.03	0.36	0.02	2.08	-0.42	--	--	0.79	0.20	0.57
1974-1976	0.42	0.79	--	0.33	-1.90	--	--	0.79	0.40	-0.71

Iron and steel										
1958-1976	2.86	0.41	0.12	1.60	-0.18	--	--	0.87	-0.04	0.73
1958-1966	4.22	0.49	0.18	2.27	0.10	--	--	0.87	0.32	1.29
1967-1973	3.02	0.14	0.17	1.76	0.01	--	--	0.87	0.08	0.96
1974-1976	-1.62	0.82	-0.16	-0.78	-2.66	--	--	0.87	0.29	-1.50
Nonferrous metal										
1958-1976	2.93	0.26	0.02	1.92	-0.11	0.01	--	0.62	0.21	0.73
1958-1966	4.77	0.15	0.03	3.08	--	0.22	--	0.62	0.66	1.51
1967-1973	2.25	0.38	0.02	1.53	-0.22	0.02	--	0.62	-0.09	0.33
1974-1976	-0.98	0.33	--	-0.65	-0.39	-0.04	--	0.62	-0.86	-0.66
Metal fabricating										
1958-1976	2.30	0.19	0.03	1.25	-0.02	--	--	0.96	-0.10	0.83
1958-1966	2.86	-0.01	0.04	1.76	0.10	--	--	0.96	0.01	1.07
1967-1973	1.96	0.38	0.02	0.85	-0.13	--	-0.09	0.96	-0.02	0.72
1974-1976	1.37	0.35	--	0.62	-0.07	--	--	0.96	-0.49	0.40
Machinery (excluding electrical equipment)										
1958-1976	4.19	0.17	0.03	2.69	-0.02	0.02	0.32	1.58	-0.60	1.29
1958-1966	4.32	0.08	0.03	2.91	0.22	0.02	0.32	1.58	-0.86	1.29
1967-1973	4.23	0.19	0.04	2.55	0.09	0.01	0.29	1.58	-0.52	1.45
1974-1976	3.70	0.37	0.01	2.38	-0.65	--	0.29	1.58	-0.28	0.94
Non-auto transportation equipment										
1958-1976	2.70	0.25	0.03	2.00	0.74	0.90	--	-2.88	1.65	0.41
1958-1966	3.43	-0.71	5.52	-4.47	0.68	0.60	--	-2.19	5.19	3.08
1967-1973	2.78	-0.83	4.73	-1.22	2.32	0.93	--	-3.61	0.46	0.10
1974-1976	0.32	0.37	0.02	0.35	1.52	1.78	--	-3.73	0.01	-0.42
Motor vehicles (excluding parts and accessories)										
1958-1976	5.81	-0.08	0.03	3.38	-0.04	--	--	1.17	1.35	2.48
1958-1966	3.81	0.05	0.01	2.22	0.79	--	--	1.17	-0.44	1.53
1968-1973	9.17	0.12	0.02	5.69	0.23	--	--	1.17	1.94	3.34
1974-1976	3.96	0.15	--	2.48	-1.63	--	--	1.17	1.80	1.34

Table C-1 (continued)

	Percentage change in gross output per person-hour	Inputs per person-hour		Capacity utiliza- tion	Plant scale	Labour force composition	Technical change	Residual	Total factor productivity	
		Capital	Energy							
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(Percentage points)										
Motor vehicle parts and accessories										
1958-1976	4.26	0.18	0.02	3.62	-0.11	--	--	1.45	-0.90	0.44
1958-1966	4.28	0.27	0.03	3.76	0.02	--	--	1.45	-1.25	0.22
1967-1973	6.67	-0.21	0.04	5.26	0.16	--	--	1.45	-0.04	1.57
1974-1976	-1.43	0.06	-0.04	-1.60	0.41	--	--	1.45	-1.71	0.15
Electrical products										
1958-1976	3.99	0.22	0.02	2.39	-0.20	-0.05	-1.97	3.23	0.35	1.37
1958-1966	5.19	0.08	0.02	3.01	0.78	0.31	-2.00	3.23	-0.24	2.08
1967-1973	4.09	0.37	0.02	2.62	-0.42	-0.11	-1.80	3.23	0.18	1.08
1974-1976	0.18	0.29	--	0.02	-2.61	0.01	-1.77	3.23	1.01	-0.13
Nonmetallic mining products										
1958-1976	2.21	0.34	0.16	0.92	0.06	--	--	0.83	-0.10	0.79
1958-1966	2.14	0.14	-0.14	0.98	0.52	--	--	0.83	-0.17	1.17
1967-1973	2.96	0.50	0.20	1.16	-0.12	--	--	0.83	0.40	1.10
1974-1976	0.68	0.60	0.11	0.17	-0.50	--	--	0.83	-0.52	-0.20
Total non-durables										
1958-1976	3.14	0.37	0.07	2.12	-0.03	-0.01	-0.29	1.11	-0.19	0.59
1958-1966	3.23	0.25	0.08	2.16	0.61	-0.13	-0.30	1.11	-0.54	0.74
1967-1973	3.97	0.44	0.06	2.69	-0.04	-0.06	-0.27	1.11	0.04	0.78
1974-1976	0.89	0.53	0.05	0.63	-0.26	--	-0.26	1.11	-0.90	-0.32

Food and beverages										
1958-1976	2.44	0.29	0.03	1.85	-0.05	-0.01	-0.50	0.95	-0.12	0.27
1958-1966	2.41	0.25	0.05	1.75	0.02	-0.11	-0.51	0.95	--	0.36
1967-1973	2.85	0.40	0.02	2.17	-0.09	-0.02	-0.46	0.95	-0.12	0.26
1974-1976	1.60	0.15	-0.01	1.41	-0.22	--	-0.45	0.95	-0.23	0.05
Tobacco										
1958-1976	4.47	0.53	0.02	3.14	0.01	0.09	-0.34	0.98	0.04	0.78
1958-1966	5.03	0.73	0.04	3.34	0.07	-0.09	-0.35	0.98	0.31	0.92
1967-1973	3.44	0.37	0.02	2.37	0.07	0.11	-0.31	0.98	-0.17	0.69
1974-1976	5.20	0.30	--	4.32	-0.01	0.05	-0.31	0.98	-0.13	0.59
Rubber and plastics										
1958-1976	6.00	0.44	0.04	3.82	0.03	--	--	1.78	-0.12	1.70
1958-1966	7.20	0.24	0.05	4.40	0.71	--	--	1.78	0.02	2.51
1967-1973	5.79	0.67	0.03	3.94	-0.74	--	--	1.78	0.11	1.15
1974-1976	2.91	0.51	0.07	1.80	0.08	--	--	1.78	-1.32	0.54
Leather										
1958-1976	2.24	0.08	0.02	1.47	-0.11	0.05	-0.45	1.08	0.10	0.66
1958-1966	1.70	0.01	0.02	1.01	0.12	-0.08	-0.46	1.08	--	0.66
1967-1973	2.05	0.18	0.02	1.46	-0.29	0.15	-0.42	1.08	-0.12	0.39
1974-1976	4.29	0.12	--	2.89	-0.40	0.21	-0.41	1.08	0.81	1.28
Textiles										
1958-1976	6.04	0.18	0.07	4.04	-0.08	--	-0.64	1.20	1.27	1.75
1958-1966	5.92	0.10	0.07	3.99	-0.11	--	0.65	1.20	0.01	1.76
1967-1973	7.58	0.09	0.08	5.14	0.17	--	0.59	1.20	0.31	2.27
1974-1976	2.79	0.61	0.05	1.65	-0.60	--	-0.58	1.20	0.45	0.48
Knitting and clothing										
1958-1976	3.56	0.08	0.12	2.47	-0.08	--	-1.07	1.96	0.08	0.90
1958-1966	3.02	-0.15	0.12	2.17	-0.16	--	-1.08	1.96	0.16	0.88
1967-1973	4.75	0.35	0.22	3.23	-0.40	--	-0.98	1.96	0.37	0.96
1974-1976	2.44	0.11	-0.09	1.62	-0.29	--	-0.96	1.96	0.09	0.81

Table C-1 (concluded)

Percentage change in gross output per person-hour	Inputs per person-hour			Capacity utilization	Plant scale	Labour force composition	Technical change	Residual	Total factor productivity	
	Capital	Energy	Materials							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(Percentage points)										
Paper and allied products										
1958-1976	2.48	0.33	0.18	1.49	0.11	--	--	0.77	-0.39	0.49
1958-1966	3.35	0.37	0.18	2.02	0.09	--	--	0.77	-0.07	0.79
1967-1973	3.58	0.43	0.22	2.13	-0.04	--	--	0.77	0.06	0.79
1974-1976	-2.68	-0.07	0.09	-1.62	-0.15	--	--	0.77	-1.71	-1.09
Printing and publishing										
1958-1976	2.14	0.33	0.01	1.04	0.07	--	--	0.97	-0.28	0.76
1958-1966	1.59	0.35	0.03	0.88	0.23	--	--	0.97	-0.87	0.33
1967-1973	3.32	0.37	0.02	1.50	0.08	--	--	0.97	0.39	1.44
1974-1976	1.00	0.16	-0.03	0.46	0.60	--	--	0.97	-1.15	0.42
Petroleum and coal										
1958-1976	4.43	0.29	0.03	3.69	--	-0.15	--	0.56	0.01	0.43
1958-1966	6.13	0.14	0.04	5.18	0.18	0.06	--	0.56	-0.03	0.77
1967-1973	5.48	0.49	0.06	4.43	0.01	-0.20	--	0.56	0.13	0.50
1974-1976	-3.11	0.24	-0.06	-2.53	-0.25	-0.67	--	0.56	-0.41	-0.77
Chemicals and chemical products										
1958-1976	4.17	0.67	0.20	2.46	-0.05	--	-1.04	2.32	-0.40	0.83
1958-1966	5.08	0.50	0.27	2.96	--	--	-1.05	2.32	0.08	1.35
1967-1973	5.62	0.54	0.15	3.51	-0.01	--	-0.95	2.32	0.06	1.42
1974-1976	-1.94	1.52	0.14	-1.50	-0.36	--	-0.93	2.32	3.12	-2.09

Table C-2

Contributions to Changes in Gross Output per Person-Hour, Non-Manufacturing Industries, 1958-1976

	Percentage change in gross output per person-hour	Inputs per person-hour		Capacity utilization	Plant scale	Labour force composition	Technical change	Residual	Total factor productivity
		Capital	Intermediate inputs						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(Percentage points)									
Agriculture, fishing, and trapping									
1958-1976	5.91	-2.50	5.66	-0.18	2.39	--	0.70	-0.16	2.75
1958-1966	9.30	-2.30	5.73	0.29	3.90	--	0.99	0.69	5.88
1967-1973	4.32	-2.37	4.87	-0.63	3.02	--	0.80	-1.37	1.82
1974-1976	-0.55	-5.55	3.88	-1.98	-3.61	--	-0.83	7.54	1.12
Forestry									
1958-1976	6.82	-2.55	3.73	-0.13	0.78	--	5.42	-0.42	5.65
1958-1966	9.12	-2.86	4.61	-0.07	1.70	--	5.91	-0.17	7.37
1967-1973	8.59	-1.86	4.93	-0.02	0.31	--	5.64	-0.41	5.52
1974-1976	-4.18	-5.75	-1.55	--	-0.86	--	5.38	-1.40	3.12
Mining									
1958-1976	5.26	2.52	2.35	0.28	-0.44	--	0.53	0.02	0.40
1958-1966	6.64	2.93	2.80	-0.21	-0.69	--	0.53	1.28	0.91
1967-1973	8.16	2.75	3.64	-0.05	0.09	--	0.53	1.20	1.77
1974-1976	-5.64	0.73	-2.01	0.27	-0.90	--	0.53	-4.25	-4.35
Construction									
1958-1976	1.79	0.82	0.27	-0.25	-0.46	0.13	1.17	0.11	0.70
1958-1966	1.68	-0.21	0.25	0.20	-0.56	0.13	1.17	0.70	1.64
1967-1973	2.63	2.00	0.39	-0.26	-0.08	0.12	1.17	-0.70	0.24
1974-1976	0.11	1.17	0.01	-0.37	-1.05	0.11	1.17	-0.94	-1.07

Communications and transportation									
1958-1976	4.22	0.66	1.20	-0.05	--	--	2.62	-0.21	2.36
1958-1966	4.72	1.07	1.46	0.03	--	--	2.62	-0.47	2.19
1967-1973	4.12	0.39	1.14	-0.16	--	--	2.62	0.14	2.60
1974-1976	2.93	0.64	0.55	-0.58	--	--	2.62	-0.30	1.74
Utilities									
1958-1976	6.97	2.06	2.50	0.13	-0.84	0.92	2.42	-0.23	2.41
1958-1966	7.07	2.54	1.40	0.09	-0.48	0.91	2.42	0.19	3.13
1967-1973	8.72	1.70	4.79	-0.12	-1.12	0.82	2.42	0.23	2.23
1974-1976	2.61	1.49	0.47	-0.62	-1.25	0.80	2.42	-0.71	0.65
Trade									
1958-1976	3.23	0.26	1.23	0.04	-0.75	--	1.99	0.46	1.74
1958-1966	3.09	0.39	1.02	0.31	-0.62	--	1.99	--	1.68
1967-1973	4.21	0.17	1.78	-0.07	-0.79	--	1.99	1.13	2.26
1974-1976	1.37	0.09	0.57	-1.43	-1.03	--	1.99	1.18	0.71
Finance, insurance and real estate									
1958-1976	1.11	2.22	0.60	1.81	-1.36	0.74	-2.45	-0.44	-1.70
1958-1966	-0.24	2.91	-0.07	0.05	-1.38	0.73	-2.45	-0.02	-3.08
1967-1973	2.88	1.50	1.48	-0.37	-1.24	0.66	-2.45	3.30	-0.10
1974-1976	1.02	1.83	0.51	1.42	-1.61	0.65	-2.45	0.67	-1.32

a The "Residual" (column 8) is that portion of growth in gross output per person-hour (column 1) *not* explained by any of the other specified influences (columns 2 through 7); that is, column 1 less the sum of columns 2 through 7.

b Column 9 consists of contributions to growth in gross output per person-hour *not* explained by changes in the quantities of non-labour inputs (columns 2 and 3); that is, column 1 minus the sum of columns 2 and 3; or, alternatively, the sum of columns 4, 5, 6, 7 and 8.

SOURCE Same as for Table C-1.

the contribution to labour productivity growth of capital inputs per person-hour rose from 0.35 percentage points for 1967-73 to 0.48 for 1974-76; growth in capital, rather than depressing productivity growth, in fact kept it from falling more than it did. The table also demonstrates the influence of labour force composition. Between the two periods the negative influence of this variable actually declined (from -0.30 to -0.29) indicating that the influx of inexperienced workers did not contribute to the productivity slowdown in total manufacturing; however, the positive effect is extremely small. The contribution to productivity improvement of growth in energy inputs fell between the two periods in question (from 0.07 to 0.03 of a percentage point for a change of -0.04) explaining little of the slowdown.

Because the 'total factor productivity' column indicates the influence of changing efficiency in production it is particularly significant to note a net contribution of -1.12 (from +0.94 to -0.18) percentage points to the slowdown in labour productivity growth - or 38.49 per cent of the total decrease in the rate of growth of output per person-hour. Most of the loss in productive efficiency is due to the influence of reduced capacity utilization.

D Measuring Provincial Productivity Differences Among Physicians

In order to measure the productivity differences of physicians among provinces, the value of the output of physicians in each province must be calculated on a consistent (or "standardized") basis. This calculation was done by substituting the Canadian average payment per service for the corresponding provincial payment in each of 116 activities in each of 18 specialties identified in the data provided by Health and Welfare Canada. Then, the dollar value so derived was added over all activities and calculated per full-time physician equivalent in each specialty to make an appropriate allowance for part-time physicians. Finally, all estimates are adjusted for provincial variations in the distribution of physicians among the various specialties.

The contribution of variations in specialization and standardized output per physician to provincial deviations in productivity from the national average is given in Table D-1. Further information will be reported in a forthcoming publication by the Economic Council.

Table D-1

Deviation of Productivity of Physicians from the National Average, by Province, 1974-1976

	Contribution		Total difference
	Difference due to specialization	Difference due to standardized output per physician	
		(Per cent)	
Newfoundland	--	13	13
Prince Edward Island	-2	--	-1
Nova Scotia	-1	-5	-6
New Brunswick	--	2	2
Quebec	1	5	6
Ontario	--	1	1
Manitoba	--	-8	-8
Saskatchewan	-2	3	1
Alberta	--	-5	-5
British Columbia	--	-10	-10

SOURCE Based on data from Health and Welfare Canada.

Notes

CHAPTER 1

- 1 *Bank of Canada Review*, June 1980, p. 4.
- 2 Bank of Canada, *Annual Report of the Governor to the Minister of Finance, 1979*, Ottawa, p. 5.

CHAPTER 2

- 1 D. Peter Dungan and Thomas A. Wilson, "Potential G.N.P: Performance and Prospects," a background study prepared for the Economic Council of Canada.

CHAPTER 3

- 1 By contrast, if the RRSP maximum deduction were indexed in the same way as personal income tax, the effect would be to increase the private savings rate and thus to increase the government deficit. (See Appendix Table B-2 for details of these projections.) However, care should be exercised in comparing the impact of the de-indexation projections with other deficit-reducing projections, since the size of the effect on the deficit is not the same.

CHAPTER 5

- 1 Someshwar P. Rao, "An Econometric Analysis of Labour Productivity in Canadian Industries: Some Further Results," E.C.C. Discussion Paper No. 134 (October 1979).
- 2 H. Sims and J. Stanton, "Recent Changes in Patterns of Productivity Growth in Canada," Department of Finance (March 1980).
- 3 David L. Emerson, *Productivity Location and the Automotive Agreement*, E.C.C. Staff Study, Catalogue No. EC22-34/1975.
- 4 E.R. Berndt and G.C. Watkins, "Factor Prices and Productivity in the Canadian Manufacturing Sector," a background study prepared for the Economic Council of Canada.
- 5 Ibid.

CHAPTER 6

- 1 H. M. Pinchin, *The Regional Impact of the Canadian Tariff*, E.C.C. Staff Study, Catalogue No. EC22-65/1979.

List of Tables

2-1	Selected Indicators from the Base Case Projection, 1980-1990	28
2-2	Canadian, United States and World Crude Oil Prices, Selected Years, 1980-1990	30
2-3	Effect on Selected Indicators of Alternative Wage and Price Assumptions, 1980-1990	35
2-4	Effect on Selected Indicators of Oil Policy Alternatives, 1980-1990	40
2-5	Effect on Selected Indicators of the Large Energy Projects Assumption, 1980-1990	46
2-6	Effect on Selected Indicators of Investment Incentive Alternatives, 1980-1990	50
3-1	Government, Private and Foreign Surplus or Deficit (-) as a Percentage of Gross National Expenditure, 1967-1990	66
3-2	Effect on Selected Indicators of Policies to Reduce the Federal Deficit, 1980-1990	70
5-1	Average Annual Percentage Change in Output and Inputs per Person-Hour, Non-Manufacturing Industries, 1958-1976	91
5-2	Average Annual Percentage Change in Output and Inputs per Person-Hour, Manufacturing Industries, 1958-1976	92
5-3	Contribution of Inter-Industry Shifts to Growth in Output per Person-Hour, 1958-1976	93
5-4	Labour Force Composition Projection by Age and Sex, Selected Years, 1980-1990	94
5-5	Percentage Distribution of Shortages Anticipated by Canadian Enterprises, by Occupational Group, 1980-1984	97
5-6	Average Annual Percentage Change in Capacity Utilization, Selected Industries, 1957-1976	100
A-1	External Environment Assumptions, Four Cases, 1980-1990	148
A-2	Effect on Selected Indicators of Alternative External Environment Assumptions, 1980-1990	150
B-1	Provincial Government Surplus or Deficit (-), National Accounts Basis, 1967-1978	151
B-2	Effect on Selected Indicators of De-Indexation of Personal Income Tax and of Indexation of Registered Retirement Savings Plans, 1980-1990	152
C-1	Contributions to Changes in Gross Output per Person-Hour, Manufacturing Industries, 1958-1976	154
C-2	Contributions to Changes in Gross Output per Person-Hour, Non-Manufacturing Industries, 1958-1976	160
D-1	Deviation of Productivity of Physicians from the National Average, by Province, 1974-1976	163

List of Charts

1-1	Average Annual Percentage Changes in Output, Canada and Major OECD Countries, 1967-1979	8
1-2	Selected Components of Gross National Expenditure in Canada, Seasonally Adjusted at Annual Rates, First Quarter 1976 to Second Quarter 1980	9
1-3	Average Annual Percentage Changes in Output and in Inputs of Labour and Capital, Canada, 1967-1979	13
1-4	Annual Percentage Change in Output per Employed Person, Canada and Major OECD Countries 1966-1979	14
1-5	Average Annual Percentage Changes in Employment, Canada and Major OECD Countries 1967-1979	15
1-6	Annual Percentage Changes in Selected Price Indices, Canada, 1967-1979	17
1-7	Earnings and Profits as Shares of Net National Income, Canada, 1966-1979	18
1-8	Average Annual Percentage Changes in Export Volume and in Output of Market Economies, 1950-1979	20
1-9	Canadian International Balance of Payments on Current Account, 1966-1979	21
1-10	Dependency on Energy Imports, Canada and Major OECD Countries, Selected Years, 1972-1978	22
2-1	Time Phasing of Large-Scale Energy Investment Projects, Base Case Projection, 1980-1992	29
2-2	Comparison of Selected External Environment Assumptions for the Base Case Projection with those Used in the Sixteenth Annual Review Outlook, 1980-1987	31
2-3	Effect of Selected Indicators of Worsening External Environment Assumptions, 1980-1987	32
2-4	Comparison of Gross National Expenditure in the Base Case with that in the High and in the Low Potential Projections, 1981-1990	53
2-5	Comparison of Consumer Price Index in the Base Case with that in the High and in the Low Potential Projection, 1981-1990	54
3-1	Government Sector Surplus or Deficit (-) by Major Components, as a Percentage of Gross National Expenditure, 1967-1990	60
3-2	Provincial Government Royalty Revenues and the Estimated Federal Government Surplus or Deficit (-) at Potential, as a Percentage of Gross National Expenditure, 1967-1990	61
5-1	Average Annual Percentage Change in Output and Inputs, per Person-Hour, Industrial Composite, 1958-1976	89
5-2	Average Annual Percentage Change in Output and Inputs, per Person-Hour, for Manufacturing, 1958-1976	90
5-3	Average Annual Percentage Change in the Share of Women and Men Aged 14 to 19 in the Labour Force, 1958-1976	94

5-4	Percentage of Canadian Enterprises Anticipating Hiring Difficulties Due to Skills Shortages, by Province, 1980-1984	95
5-5	Percentage of Canadian Enterprises Anticipating Hiring Difficulties Due to Skills Shortages, by Industry Group, 1980-1984	96
6-1	Annual Percentage Change in Gross Regional Product per Employed Person in Four Regions, 1962-1978	107
6-2	Average Annual Percentage Change in Shipments of Goods per Person-Hour from Manufacturing Establishments, by Region, 1962-1978	109
6-3	Productivity in Provincial Offices of the Income Maintenance Branch, Health and Welfare Canada, as a Percentage of the National Average, 1972-1973	114
6-4	Number of Computers Used for Production Control per Billion Dollars of Value-Added in Goods-Producing Industries, by Region, 1961-1973	115
6-5	Sales in Shopping Centres as a Percentage of Total Retail Sales, by Region, 1961-1973	116
6-6	Percentage of General International Cargo in Containers at Five Ports, 1969-1975	117
6-7	Value-Added per Person-Hour, Newfoundland as a Percentage of Ontario, Selected Industries	118
6-8	The Diffusion of Selected Technologies, Newfoundland and Ontario, 1957-1978	119

Acknowledgement

The Council wishes to thank the many staff members who took part in the preparation of the Seventeenth Annual Review, and especially the following groups and individuals:

Seventeenth Annual Review Group

D. Paproski, Director
L. Buchanan
D. B. MacMillan

CANDIDE Group

R. S. Preston, Director
C. Braithwaite
B. Cain
B. L. Eyford
B. K. Lodh
P. S. Rao
H. M. Saiyed
T. T. Schweitzer

Communications Group

Others

L. Auer — Regional Studies Group (Fiscal)
K. E. A. de Silva — Growth and Productivity Group
J. Menic — Regional Studies Group (Fiscal)
K. Patterson — Growth and Productivity Group
N. M. Swan — Regional Studies Group (Development)

HC/111/.E26/n.17

Economic Council of Canada

A climate of

uncertainty

dhye

c.1

tor mai

